GC(51)/2

The Agency's Programme and Budget

2008–2009

IAEA

Atoms for Peace: The First Half Century

1957–2007

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Atoms for Peace: The First Half Century

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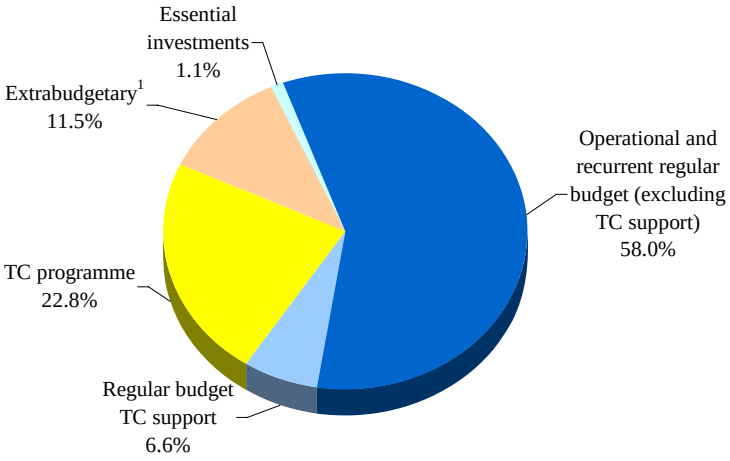
Contents

2008–2009 Total Resources at a Glance



- €289 million in 2008 and €291 million in 2009 for operational and recurrent *regular budget* activities described in this document. This portion of the regular budget for 2008 remains in real terms at the same level as the regular budget for 2007. The average price adjustment for 2008 is 2.8%.
- €4 million in 2008 and €5 million in 2009 for *essential investments* consisting of infrastructure related projects or purchase of equipment and services that are not of an operational or recurrent nature.
- €54 million in 2008 and €49 million in 2009 for *extrabudgetary* activities, described in this document, including €16 million for the Nuclear Security Fund (NSF) in 2008 and €16 million in 2009.
- €101 million in 2008 and €103 million in 2009 for the *technical cooperation programme*.

		2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Major Programmes	1. Nuclear Power, Fuel Cycle and Nuclear Science	28 436 786	28 437 521	56 874 307
	2. Nuclear Techniques for Development and Environmental Protection	32 493 885	32 495 383	64 989 268
	3. Nuclear Safety and Security	23 515 728	23 516 674	47 032 402
	4. Nuclear Verification	113 672 507	115 879 993	229 552 500
	5. Policy, Management and Administration	74 469 275	74 469 602	148 938 877
	6. Management of Technical Cooperation for Development	16 241 201	16 241 201	32 482 402
	Operational and recurrent regular budget	288 829 382	291 040 374	579 869 756
	Essential investments	4 011 000	5 420 000	9 431 000
	Total Agency Programmes	**292 840 382**	**296 460 374**	**589 300 756**
	Extrabudgetary including Nuclear Security Fund	54 363 440	48 539 422	102 902 862
	Technical Cooperation programme	101 000 000	103 000 000	204 000 000
	Total resources[2]	**448 203 822**	**447 999 796**	**896 203 618**

[1] Includes funds from other UN organizations and the Nuclear Security Fund.

[2] Excludes unfunded activities of €41 504 675 for the biennium.

PART I

OVERVIEW

INTRODUCTION

1. The preparation of *The Agency's Programme and Budget 2008–2009* was guided by the vision, goals, strategic objectives and actions of the *Medium Term Strategy* 2006–2011 (MTS) contained in document GOV/2005/8 which was considered and taken note of by the Board of Governors at its March 2005 session, with the understanding that it be used by the Secretariat as a framework for the formulation of programme and budget proposals.

2. The implementation plan of the MTS was subsequently presented to the Programme and Budget Committee in May 2006 in document GOV/2006/21 *"Planning for the 2008–2009 and 2010–2011 Programme and Budget Proposals"*. This presented the programmes needed for the implementation of the strategy, identified essential investments, linked the programme objectives with the goals and strategic objectives of the MTS and provided information on changes in programme directions and initial cost estimates.

3. GOV/2007/1 *The Agency's Draft Programme and Budget 2008–2009* was presented to Member States in February 2007 and discussed at the Programme and Budget Committee in May 2007 and at the June 2007 meeting of the Board of Governors. In July 2007, the Board agreed to the proposals contained in GOV/2007/1/Mod.1 *Modification to the Agency's Draft Programme and Budget 2008–2009*.

4. The present document elaborates further on the programme of work of the Agency and the corresponding budget estimates for 2008–2009. The essential investments that must be undertaken in the 2008–2009 biennium have been determined separately from the resources for operational and recurrent programmatic activities. In this way Member States can compare the operational and recurrent programmatic needs for 2008–2009 with those of 2007. It should be noted, in addition, that because essential investments are shown separately, they will not affect the budget level to be used for comparison purposes in future biennia.

PROGRAMME DEVELOPMENT FRAMEWORK

Programme structure

5. As in previous biennia, the Agency's programme of work is divided into major programmes. Some of the major programmes cover scientific and technical fields. This is the case for:

- Major Programme 1. Nuclear Power, Fuel Cycle and Nuclear Science
- Major Programme 2. Nuclear Techniques for Development and Environmental Protection
- Major Programme 3. Nuclear Safety and Security
- Major Programme 4. Nuclear Verification

6. Other major programmes represent managerial and administrative functions which provide key inputs and/or support to the scientific and technical programmes as well as to the technical cooperation (TC) programme. These are:

- Major Programme 5. Policy, Management and Administration
- Major Programme 6. Management of Technical Cooperation for Development

7. The administrative and overall Agency management functions previously grouped in Major Programmes 5 and 7 have been merged into a single Major Programme 5.

8. Because of the difference in the nature of the two types of major programmes, different programmatic hierarchies have been used for the 2008–2009 biennium in their design. The hierarchy used in the **scientific and technical major programmes** is: major programme, programme,

subprogramme and project. The term *project* denotes coherent clusters of activities that have an identifiable commencement date and an expected termination date. When the cluster of activities in a given group is repetitive in nature from one cycle to the next, the term *recurrent project* is used and hence no beginning and end dates are given.

9. With respect to the **managerial and administrative major programmes**, the hierarchy used is: major programme, function and subfunction. Most activities contained in the subfunctions are necessary, predictable, repetitive and continuous from one cycle to the other. Thus, an indication as to the duration of a subfunction is not appropriate.

Follow-up on lessons learned

10. In the development of the 2008–2009 Programme and Budget, full account has been taken of the lessons learned contained in:

- *Programme Performance Report for 2004–2005* (GOV/2006/41) and *Mid-Term Progress Report for 2006–2007* (GOV/INF/2007/3 and GOV/INF/2007/3/Corr.1);
- *2005 Programme Evaluation Report* (GOV/INF/2006/6) and *2006 Programme Evaluation Report* (GOV/INF/2007/4);
- *Medium Term Strategy 2001–2005: Implementation Report* (GOV/INF/2006/12); and *Medium Term Strategy 2006–2011* (GOV/2005/8);
- *The Agency's Accounts for 2005* (GC(50)/8) and *The Agency's Accounts for 2006* (GOV/2007/13 and GOV/2007/13/Corr.1);
- *The Safeguards Implementation Report for 2005* (GOV/2006/31) and *The Safeguards Implementation Report for 2006* (GOV/2007/21);
- *Evaluation of Technical Cooperation Activities in 2006* (GOV/INF/2006/15).

11. Lessons learned from reviews of different areas of the Agency's programme and recommendations of Standing Advisory Groups have also been taken into consideration, and details of the corresponding follow-ups are indicated under the respective programmes.

12. Lessons learned from the 2004–2005 and 2006 programme performance assessment on programme formulation relate essentially to the design of performance parameters: objectives, outcomes and performance indicators. In this document, outcomes are directly linked to the programme objectives, which in turn are linked to the objectives of the MTS. Only performance indicators for which data can readily be measured have been selected and the corresponding baselines have been established.

Risk assessment

13. Risk assessment implies the identification, during the formulation of the programme of work, of potential influencing factors, both internal and external, which might impede the ability of the Agency to deliver its outputs, to achieve its outcomes or to meet its objectives in an effective and efficient manner. In past biennia, since the introduction of the results based approach, recording of assumptions on the impact of potential factors was not done systematically because the Secretariat was focusing first on the fundamental elements of the approach.

14. In the formulation of this document, programme managers have been requested to identify and assess risks, along with their possible causes and impacts. This will allow for appropriate risk management during the implementation of the programme in order to ensure the achievement of the planned outcomes.

Prioritization

15. The Agency continues to pay close attention to prioritization among competing activities. This is essential to the optimal allocation of resources during the planning phase of the programme and budget. Prioritization also ensures effective and efficient use of resources during the implementation phase.

16. The general prioritization criteria that are used and that apply to all programmes are:

- Statutory responsibility and legal commitments;
- Decisions of the Policy-making Organs;
- Expressions of priority attached by Member States to various activities;
- Recommendations of standing and other review and advisory bodies;
- Conclusions and recommendations of evaluation panels.

17. In addition, specific criteria have been developed for prioritization within each programme. These criteria relate to the particular nature of the activities covered by the programme. They can be found in each programme under the title “specific criteria for prioritization”.

18. As in previous biennia, three levels of priorities have been established in each programme, reflecting the fact that the Agency’s programme includes only activities of high priority. Projects are assigned to one of the three levels of priority, with priority 1 being the highest and representing projects that are most essential for the achievement of the Agency’s mandate and strategic objectives.

Efficiency gains and process improvements

19. Efficiencies and productivity improvements are continuously pursued by the Secretariat. Improvement of efficiency and productivity, without sacrificing effectiveness, involves streamlining of processes in all areas of the Agency’s work; not just in the administrative area. Efforts in this respect continue to be supported by the different functions of the Office of Internal Oversight Services: audit, programme evaluation and management services.

20. The optimization and effective utilization of human and financial resources were amongst the major objectives of the reorganizations of the Department of Technical Cooperation and the Office of Procurement Services and have been based on thorough analysis of work methods and procedures and selection of the most cost efficient and effective approaches for delivering quality services to Member States. The coordination of activities that require more than one organizational unit for their delivery continues to be promoted, a case in point being the new projects implemented jointly by staff of the Department of Nuclear Energy and the Department of Nuclear Safety and Security. Management of records and communications, nuclear installation safety, and the International Nuclear Information System (INIS) and nuclear knowledge management are other areas where there have been significant efforts to improve work flow and achieve efficiency while improving the effectiveness of the services.

21. To support the streamlining of the programme and budget process, a new Agency-wide software application has been used for the preparation of the 2008–2009 proposals, eliminating the need for preparation, maintenance and compilation of individual databases throughout the Secretariat. In addition, the programme and budget formulation process itself has been shortened, eliminating one of the draft versions of the Programme and Budget document. This has allowed for a more focused analysis of past performance, lessons learned and current and future trends. It has also made it possible to include the price adjustments for 2008 in the programme and budget proposals provided to Member States.

22. Other efficiency measures which have contributed to the framework of the 2008–2009 proposals have been the implementation of more stringent office space standards which enables the Agency to

use its premises more efficiently in light of an increasing number of activities. Through the use of electronic signatures, transaction authorizations can be done more efficiently, while maintaining the necessary audit trail and authenticity.

23. There is a growing focus on quality management, promoting process improvements and adoption of relevant best practices. In the scientific and technical areas, this has resulted in the accreditation in 2006 (i.e. ISO 17025) of the Agency's radiation monitoring and protection services.

24. These efficiency gains and process improvements contribute to the Secretariat's ability to achieve its goals and objectives within a budget that does not exceed in real terms the 2007 levels (excluding essential investments).

BUDGETARY INFORMATION

Budgetary presentation

25. The present document contains the following tables:

- **Table 1**: The Regular Budget — By Programme and Major Programme
- **Table 2**: The Regular Budget — Summary of Income
- **Table 3(a)–3(b)**: Total Resource Requirements — By Programme and Major Programme
- **Table 4**: The Regular Budget — By Item of Expenditure
- **Tables 5–10**: Summary of Regular Budget Resources for the Biennium
- **Table 11**: Essential investments for 2008–2009 at 2008 prices

26. Table 1 compares the adjusted 2007 regular budget to the 2008 and 2009 budgetary proposals. Programme increases or decreases are shown for both years of the biennium, as are price adjustments for 2008.

27. Table 2 is a summary of the income expected in 2008 and 2009. It includes assessed contributions from Member States, income from reimbursable work for others and other miscellaneous income.

28. Tables 3(a) and 3(b) show all resources required to carry out the activities of the Agency for both years of the biennium, including: the regular budget (operational and recurrent portion); essential investments; funds from other United Nations organizations; core activities unfunded in the regular budget (CAURBs) — both those for which contributions from Member States are expected ('extrabudgetary') and those for which no funding is currently foreseen ('unfunded'); the NSF; and the technical cooperation (TC) programme.

29. Table 4 shows the regular budget estimates for 2008 and 2009 and the price adjustment for 2008 by item of expenditure.

30. Tables 5–10 compare the adjusted regular budget for 2007 with the 2008 and 2009 proposals for each major programme, programme and subprogramme.

31. Table 11 shows the essential investments for 2008 and 2009 at 2008 prices.

32. In addition, tables showing the resource requirements for all projects under each major programme and details of CAURBs for which no funding is available are listed under the detailed narrative of each major programme.

Budget currency and rate of exchange

33. The regular budget estimates for 2008–2009 have been prepared in euro, using a budget rate of exchange of one euro to one US dollar. The same rate was used for the 2006 and 2007 approved

budgets. The decision to use the euro as the functional currency[3] does not apply to the TC programme or to extrabudgetary funds, as they involve predominantly contributions and expenditures in US dollars. Nevertheless, to enable the resources available to the Agency to be readily summarized in one currency and, where appropriate, to make comparisons with 2007, all dollar funds are expressed in euro at the budget exchange rate.

Core activities unfunded in the regular budget

34. As in previous biennia, recourse has been made to so-called *core activities unfunded in the regular budget*. These are activities which either should be part of the Agency's regular budget programme if funding permitted, or which involve a degree of uncertainty as to whether they will be implemented and have therefore not been included as part of the regular budget. CAURBs comprise both activities expected to be financed from extrabudgetary funds ('extrabudgetary CAURBs'), and those for which no funding is currently foreseen ('unfunded CAURBs'). The latter have been included in the programme proposals to draw this situation to the attention of Member States with a view to attracting extrabudgetary funds. They are identified in the programme for adoption by the Board of Governors so that they may be implemented without further Board approval should such funds be received or regular budget savings materialize in the course of the biennium. Where such activities are not funded by extrabudgetary contributions or from savings, they will not be implemented. It should be noted that the amounts shown against CAURBs are indicative figures and do not represent 'ceilings'.

Extrabudgetary funds

35. The Agency continues to rely on extrabudgetary funds received from Member States to carry out its activities. $39.4 million were received in 2005, and $36.6 million in 2006 (excluding TC extrabudgetary funds amounting to $13.1 million and $18.8 million respectively). For 2008 and 2009, $54.4 million and $48.5 million respectively are required. These amounts have implications on support service areas (e.g. finance, personnel, IT, procurement, etc.) and, as recommended by the External Auditor, the Secretariat is assessing the implications of adopting the standard practice of the UN common system of charging programme support costs.

Nuclear Security Fund (NSF)

36. GOV/2005/50 *(Nuclear Security — Measures to Protect Against Nuclear Terrorism)* presented the Nuclear Security Plan for 2006–2009, and called upon Member States to contribute to the NSF for the continuation of the Agency's activities related to measures to prevent nuclear terrorism. The ability of the Agency to implement the nuclear security programme depends on this sustained funding from Member States and organizations. Given the high priority that Member States assign to nuclear security, and the urgent need to implement the nuclear security plan, voluntary funding is, indeed, expected for the 2008–2009 biennium to supplement the limited regular budget funding available for this activity. The Secretariat continues to work with donors to increase the predictability and flexibility of funding with a view to minimizing the number of conditions placed on the voluntary contributions.

Funds from other United Nations organizations

37. The Agency cooperates with other United Nations organizations such as FAO, IMO, UNDP, UNEP, UNFPA, UNESCO, UNMOVIC, UNOPS, UNSCEAR, WHO and WMO, as opportunities

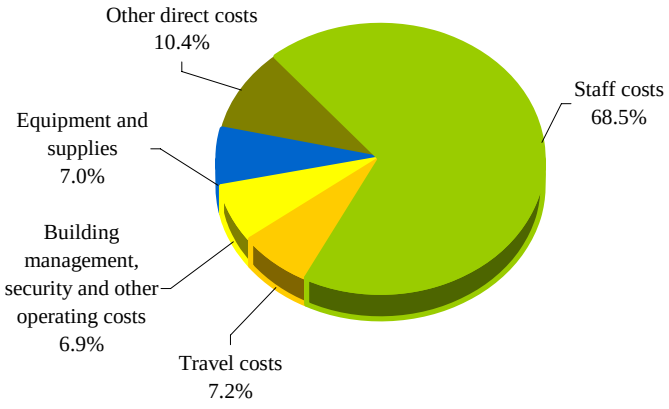
[3] In accordance with the decision of the Board of Governors (GOV/OR.1086 and GOV/2003/27) at its meeting of November 2003, the euro was adopted as the functional currency, effective 1 January 2006, for the Regular Budget and the Working Capital Fund.

allow[4]. Most of the relevant work planned for 2008 and 2009 is carried out under Major Programme 2 (Nuclear Techniques for Development and Environmental Protection) and is reflected in Tables 3(a) and 3(b).

Major items of expenditure

38. The principal component of the Agency's regular budget consists of staff costs, which include common staff costs as detailed below. For 2008–2009, staff costs represent 68.5% of the regular budget. Other major components are equipment and supplies 7.0%, travel costs 7.2%, building management, security and other operating costs 6.9% (of which Vienna International Centre (VIC) common building management and security services comprise the largest portion), and other direct costs 10.4%. Details of the budget by item of expenditure are shown in Table 4 and in the Management Part, The Regular Budget By Item of Expenditure (including Shared Costs and Laboratory Activities).

2008–2009 regular budget by major item of expenditure



39. The increase of €5.7 million in staff costs for Agency Programmes for 2008 when compared with 2007, shown in Table 4, can be attributed to several factors. These include, inter alia, an adjustment in the lapse factor applied to salaries in 2008 compared to 2007; implementation of new programmes and activities; requests for reclassification of posts; annual salary increments; and the corresponding increase in common staff costs.

40. Staff costs are calculated on the basis of the total salaries payable for the number of staff members expected to be employed during the biennium. To account for possible vacancies, an assumption is made regarding the length of the time between a post vacancy and the filling of that vacancy (the 'lapse factor'). During the preparation of the 2008–2009 budget proposals, the lapse factor was reviewed based on the latest (2006) budgetary performance and the actual lapse incurred in 2006. An adjustment was made to reduce the lapse taking into account the necessary level of staffing required in 2008–2009 and fewer anticipated vacant posts.

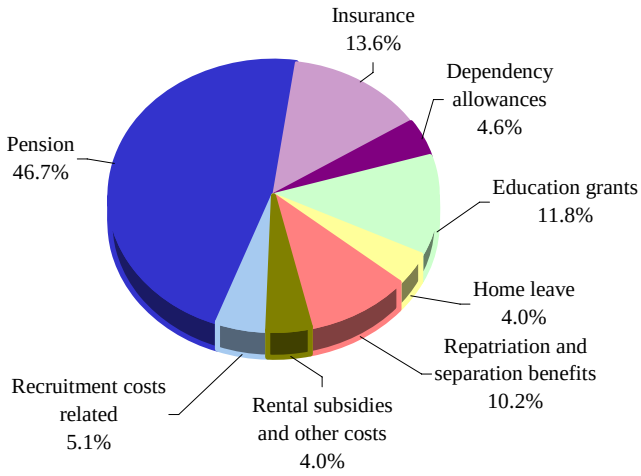
41. Implementation of new programmes and activities and the reclassification of posts, which are required to achieve programme outcomes, resulted in higher staff costs.

[4] Funds received during 2006 included €1 004 031 from FAO, €80 454 from IMO, €188 000 from UNEP, €151 800 from UNMOVIC, and €109 491 from UNOPS.

42. Another element which impacts salary costs is the salary increment awarded annually to staff. A higher average step per grade in 2008 as compared to 2007 resulted in an increase in salaries.

43. Included in the €5.7 million mentioned above is an increase of €1.8 million in common staff costs. Common staff costs include, inter alia, pension contributions, insurance and employee benefits. They are derived as a percentage of the estimated salary costs. Based on experience in recent years, an amount equal to 45.5% of salary costs is required. The following shows the breakdown of the actual common staff costs in 2006:

2006 – Distribution of common staff costs



Technical adjustments

44. To permit meaningful comparison of the budget proposals of 2008–2009 with those of 2007, technical adjustments have been made to the approved 2007 regular budget figures, as follows:

- The cost of certain electronic files accessible by all staff and the support for network services, shown under each major programme in 2007, has been consolidated in the 2008–2009 proposals under Major Programme 5, to streamline and improve the management of funds. For purpose of comparison, a corresponding technical adjustment of €463 193 was made in the 2007 budget.
- €6.9 million of data processing costs within Major Programme 5 were shown in previous biennia as a shared service. To add transparency to the budget, the components of these costs, i.e. staff costs, equipment, contracts, etc., are now shown under their respective items of expenditure. Corresponding technical adjustments were made in the budget figures for 2007.
- Supplementary appropriations for security enhancement were made available to the Agency in 2004 and 2005 to fund compliance with the United Nations system-wide Headquarters-Minimum Operating Security Standards (H-MOSS). The special appropriations for 2006–2007 included recurring costs of €2.5 million for additional security officers, training requirements, supplies, equipment and maintenance costs at Headquarters and liaison offices and laboratories. In the 2008–2009 programme and budget, these recurring costs have been incorporated under General Services in Major Programme 5. A corresponding technical adjustment was made in the budget figures for 2007.
- To improve coordination and effectiveness in delivering the programmes, two projects on plant life management and two projects on plant management systems, previously budgeted in Major Programmes 1 and 3, were consolidated. Starting in 2008–2009, a single project

for plant life management will be budgeted in Major Programme 1 and a single project for plant management systems will be budgeted in Major Programme 3. The corresponding technical adjustments to the 2007 budget resulted in a net transfer of €95 052 from Major Programme 3 to Major Programme 1.

Price adjustments

45. In calculating price adjustments, the Agency has, for many years, followed the policy of "semi-full budgeting", a methodology which has been recognized by the United Nations and its various review bodies, including the Joint Inspection Unit. In this methodology, the trends and expectations for salaries and related expenditures — which depend on index movements and forecasts by the International Civil Service Commission — are taken into account. For other items, the actual increases recorded during the last year for which figures are available (in the present circumstances the year 2006 compared with 2005) are included in the price adjustments.

46. For 2008, the price adjustments for the various items of expenditure, following the described methodology, are indicated below. The weighted average adjustment over the 2007 approved budget level is 2.8%. Price adjustments for 2009, the second year of the biennium, will be submitted to Member States for approval by the Board of Governors in June 2008, in the 2009 Budget Update document.

Price adjustments

Items of expenditure	2006 budget adjustment	2007 budget adjustment	2008 budget adjustment
Professional salaries	0.1	3.1	2.5
General Service salaries	1.8	2.5	2.7
Staff travel	2.3	2.0	0.8
Non staff travel	4.2	6.5	2.6
Interpretation	–	8.8	–
Representation and hospitality	0.6	2.7	2.0
Training	0.8	0.3	2.5
Equipment	2.6	0.6	2.4
Supplies and materials	3.6	2.9	4.0
Research and technical contracts	3.9	7.2	3.2
General operating costs	2.4	4.3	3.6
Contracts	1.8	1.7	2.1
Miscellaneous	2.0	2.0	2.0

Report on the Budget to the United Nations General Assembly

47. In accordance with Article XVI of the Agency's relationship agreement with the United Nations (INFCIRC/11, part I), the budget may be reviewed by the Advisory Committee on Administrative and Budgetary Questions (ACABQ), which would report on the administrative aspects thereof to the United Nations General Assembly.

LIST OF INTERNATIONAL CONFERENCES/SYMPOSIA

2008	2009
Major Programme 1 – Nuclear Power, Fuel Cycle and Nuclear Science	
• 22nd Fusion Energy Conference	• Ministerial Conference on the Future Application of Nuclear Power • Uranium Raw Material for Nuclear Fuel Cycle: Exploration, Mining, Production, Supply and Demand, Economics and Environmental Issues • Materials Research and Utilization of Accelerators • Fast Reactors and Closed Fuel Cycle – Challenges and Opportunities
Major Programme 2 – Nuclear Techniques for Development and Environmental Protection	
• Induced Mutations in Plants	• Advances in Radiation Oncology • FAO/IAEA Symposium on the Sustainable Improvement of Animal Production and Health
Major Programme 3 – Nuclear Safety and Security	
• Nuclear Security • Topical and Infrastructure Issues in Nuclear Installation Safety	• Effective Nuclear Regulatory Systems • Remediation of Land Contaminated by Radioactive Material/Residues
Cross-cutting conferences	
	• Opportunities and Challenges for Water Cooled Reactors in the 21st Century

I.1 Budgetary Requirements

by Programme and Major Programme

Table 1. The Regular Budget — by Programme and Major Programme

	Programme / Major Programme	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	Variance 2008 over 2007 %	2009 estimates at 2007 prices	Variance 2009 over 2008 €	Variance 2009 over 2008 %	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
1.	**Nuclear Power, Fuel Cycle and Nuclear Science**										
1.0	Overall Management, Coordination and Common Activities	705 918	877 173	171 255	24.3%	877 173	-	-	2.7%	**901 233**	**901 229**
1.1	Nuclear Power	5 364 458	5 505 277	140 819	2.6%	5 505 277	-	-	2.7%	**5 655 513**	**5 655 517**
1.2	Nuclear Fuel Cycle and Materials Technologies	2 475 778	2 475 778	-	-	2 475 778	-	-	2.7%	**2 543 593**	**2 543 474**
1.3	Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	10 286 786	9 974 712	(312 074)	(3.0%)	9 974 712	-	-	3.0%	**10 278 727**	**10 279 018**
1.4	Nuclear Science	8 822 761	8 822 761	-	-	8 822 761	-	-	2.7%	**9 057 720**	**9 058 283**
	Major Programme 1	**27 655 701**	**27 655 701**	**-**	**-**	**27 655 701**	**-**	**-**	**2.8%**	**28 436 786**	**28 437 521**
2.	**Nuclear Techniques for Development and Environmental Protection**										
2.0	Overall Management, Coordination and Common Activities	766 731	879 141	112 410	14.7%	876 577	(2 564)	(0.3%)	2.8%	**903 350**	**900 629**
2.1	Food and Agriculture	12 255 390	11 846 256	(409 134)	(3.3%)	11 847 234	978	-	3.0%	**12 199 485**	**12 202 453**
2.2	Human Health	7 945 405	8 390 236	444 831	5.6%	8 391 822	1 586	-	2.9%	**8 630 322**	**8 632 245**
2.3	Water Resources	3 378 617	3 293 614	(85 003)	(2.5%)	3 293 614	-	-	2.8%	**3 386 477**	**3 386 378**
2.4	Environment	5 237 700	5 248 814	11 114	0.2%	5 248 814	-	-	3.0%	**5 405 195**	**5 404 658**
2.5	Radioisotope Production and Radiation Technology	1 990 331	1 916 113	(74 218)	(3.7%)	1 916 113	-	-	2.8%	**1 969 056**	**1 969 020**
	Major Programme 2	**31 574 174**	**31 574 174**	**-**	**-**	**31 574 174**	**-**	**-**	**2.9%**	**32 493 885**	**32 495 383**
3.	**Nuclear Safety and Security**										
3.0	Overall management, coordination and common activities	930 990	888 990	(42 000)	(4.5%)	889 990	1 000	0.1%	2.7%	**913 158**	**914 176**
3.1	Incident and Emergency Preparedness and Response	1 111 330	1 391 180	279 850	25.2%	1 372 180	(19 000)	(1.4%)	2.8%	**1 429 642**	**1 410 003**
3.2	Safety of Nuclear Installations	8 277 444	8 153 175	(124 269)	(1.5%)	8 171 175	18 000	0.2%	2.8%	**8 378 811**	**8 398 312**
3.3	Radiation and Transport Safety	5 262 549	5 215 127	(47 422)	(0.9%)	5 215 127	-	-	2.8%	**5 359 314**	**5 359 052**
3.4	Management of Radioactive Waste	6 174 722	6 158 563	(16 159)	(0.3%)	6 158 563	-	-	2.7%	**6 327 422**	**6 327 751**
3.5	Nuclear Security	1 127 600	1 077 600	(50 000)	(4.4%)	1 077 600	-	-	2.8%	**1 107 381**	**1 107 380**
	Major Programme 3	**22 884 635**	**22 884 635**	**-**	**-**	**22 884 635**	**-**	**-**	**2.8%**	**23 515 728**	**23 516 674**
4.	**Nuclear Verification**										
4.0	Overall management, coordination and common activities	1 011 800	1 029 586	17 786	1.8%	1 029 586	-	-	2.7%	**1 057 670**	**1 057 670**
4.1	Safeguards	109 765 609	109 747 823	(17 786)	-	111 912 475	2 164 652	2.0%	2.6%	**112 614 837**	**114 822 323**
	Major Programme 4	**110 777 409**	**110 777 409**	**-**	**-**	**112 942 061**	**2 164 652**	**2.0%**	**2.6%**	**113 672 507**	**115 879 993**
5.	**Policy, Management and Administration**										
	Policy, Management and Administration	72 228 577	72 228 577	-	-	72 228 577	-	-	3.1%	**74 469 275**	**74 469 602**
	Major Programme 5	**72 228 577**	**72 228 577**	**-**	**-**	**72 228 577**	**-**	**-**	**3.1%**	**74 469 275**	**74 469 602**
6.	**Management of Technical Cooperation for Development**										
	Management of Technical Cooperation for Development	15 791 504	15 791 504	-	-	15 791 504	-	-	2.8%	**16 241 201**	**16 241 201**
	Major Programme 6	**15 791 504**	**15 791 504**	**-**	**-**	**15 791 504**	**-**	**-**	**2.8%**	**16 241 201**	**16 241 201**
	Operational and recurrent budget	**280 912 000**	**280 912 000**	**-**	**-**	**283 076 652**	**2 164 652**	**0.8%**	**2.8%**	**288 829 382**	**291 040 374**
	Essential Investments										
1.	Nuclear Power, Fuel Cycle and Nuclear Science		50 000	50 000	-	50 000	-	-		**50 000**	**50 000**
2.	Nuclear Techniques for Development and Environmental Protection		810 000	810 000	-	190 000	(620 000)	(76.5%)		**810 000**	**190 000**
3.	Nuclear Safety and Security		210 000	210 000	-	110 000	(100 000)	(47.6%)		**210 000**	**110 000**
4.	Nuclear Verification		1 315 000	1 315 000	-	3 294 000	1 979 000	150.5%		**1 315 000**	**3 294 000**
5.	Policy, Management and Administration		1 314 000	1 314 000	-	1 464 000	150 000	11.4%		**1 314 000**	**1 464 000**
6.	Management of Technical Cooperation for Development		312 000	312 000	-	312 000	-	-		**312 000**	**312 000**
	Total Essential Investments		**4 011 000**	**4 011 000**	**-**	**5 420 000**	**1 409 000**	**35.1%**	**-**	**4 011 000**	**5 420 000**
	Total Agency Programmes	**280 912 000**	**284 923 000**	**4 011 000**	**1.4%**	**288 496 652**	**3 573 652**	**1.3%**	**2.8%**	**292 840 382**	**296 460 374**
	Reimbursable Work for Others	2 699 000	2 426 997	(272 003)	(10.1%)	2 436 997	10 000	0.4%	2.6%	**2 490 805**	**2 501 135**
	Total Regular Budget	**283 611 000**	**287 349 997**	**3 738 997**	**1.3%**	**290 933 649**	**3 583 652**	**1.2%**	**2.8%**	**295 331 187**	**298 961 509**
	Less Miscellaneous Income										
	Reimbursable Work for Others	2 699 000	2 426 997	(272 003)	(10.1%)	2 436 997	10 000	0.4%	2.6%	**2 490 805**	**2 501 135**
	Other Miscellaneous Income	2 857 000	4 482 000	1 625 000	56.9%	4 482 000	-	-	-	**4 482 000**	**4 482 000**
	Assessment on Member States	**278 055 000**	**280 441 000**	**2 386 000**	**0.9%**	**284 014 652**	**3 573 652**	**1.3%**	**2.8%**	**288 358 382**	**291 978 374**

Table 2. The Regular Budget - Summary of Income

	2007 budget	2008 estimates at 2008 prices	Variance 2008 over 2007	2009 estimates at 2008 prices	Variance 2009 over 2008
Operational and recurrent portion of regular budget	278 055 000	284 347 382	6 292 382	286 558 374	2 210 992
Essential investments	-	4 011 000	4 011 000	5 420 000	1 409 000
Assessed contributions on Member States	278 055 000	288 358 382	10 303 382	291 978 374	3 619 992
Miscellaneous income					
Reimbursable work for others					
Printing services	1 113 500	795 410	(318 090)	805 740	10 330
Medical services	797 100	793 050	(4 050)	793 050	-
Radiation protection and monitoring services	103 100	106 090	2 990	106 090	-
Translation services	222 100	282 700	60 600	282 700	-
Nuclear Fusion Journal	153 200	157 306	4 106	157 306	-
Other financial services	-	46 249	46 249	46 249	-
Laboratory services	250 000	250 000	-	250 000	-
Marine Environment Laboratory services	60 000	60 000	-	60 000	-
Subtotal Reimbursable work for others	2 699 000	2 490 805	(208 195)	2 501 135	10 330
Other					
Attributable to specific programmes					
INIS Products	35 000	45 000	10 000	45 000	-
Publications of the Agency - other	350 000	375 000	25 000	375 000	-
Laboratory income	240 000	240 000	-	240 000	-
Amounts recoverable under Safeguards agreements	270 000	300 000	30 000	300 000	-
Other Service income	42 000	2 000	(40 000)	2 000	-
Subtotal	937 000	962 000	25 000	962 000	-
Not attributable to specific programmes					
Investment and interest income	1 400 000	3 000 000	1 600 000	3 000 000	-
Gain (Loss) on exchange of currencies	-	-	-	-	-
Other	520 000	520 000	-	520 000	-
Subtotal	1 920 000	3 520 000	1 600 000	3 520 000	-
Subtotal Other	2 857 000	4 482 000	1 625 000	4 482 000	-
Total Miscellaneous Income	5 556 000	6 972 805	1 416 805	6 983 135	10 330
Total Regular Budget Income	283 611 000	295 331 187	11 720 187	298 961 509	3 630 322

Table 3(a). Total Resource Requirements for 2008 by Programme and Major Programme

	Programme / Major Programme	Regular Budget		Extrabudgetary					
		Operational and recurrent budget at 2008 prices	Essential Investments at 2008 prices	Funds from UN Organisations	CAURBs Extrabudgetary	NSF	TC Programme	**Total**	CAURBs Unfunded
1	**Nuclear Power, Fuel Cycle and Nuclear Science**								
1.0	Overall Management, Coordination and Common Activities	901 233	-	-	-	-	-	**901 233**	-
1.1	Nuclear Power	5 655 513	-	-	1 932 929	-	3 785 200	**11 373 642**	201 000
1.2	Nuclear Fuel Cycle and Materials Technologies	2 543 593	-	-	397 177	-	1 193 300	**4 134 070**	107 251
1.3	Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	10 278 727	-	-	-	-	2 214 000	**12 492 727**	-
1.4	Nuclear Science	9 057 720	50 000	-	462 747	-	9 961 200	**19 531 667**	446 309
	Major Programme 1	28 436 786	50 000	-	2 792 853	-	17 153 700	**48 433 339**	754 560
2	**Nuclear Techniques for Development and Environmental Protection**								
2.0	Overall Management, Coordination and Common Activities	903 350	-	-	-	-	-	**903 350**	-
2.1	Food and Agriculture	12 199 485	195 000	2 222 267	-	-	12 280 800	**26 897 552**	813 000
2.2	Human Health	8 630 322	170 000	-	796 454	-	25 981 000	**35 577 776**	892 258
2.3	Water Resources	3 386 477	45 000	-	-	-	5 483 000	**8 914 477**	-
2.4	Environment	5 405 195	400 000	184 584	514 458	-	4 375 200	**10 879 437**	415 000
2.5	Radioisotope Production and Radiation Technology	1 969 056	-	-	-	-	11 091 800	**13 060 856**	-
	Major Programme 2	32 493 885	810 000	2 406 851	1 310 912	-	59 211 800	**96 233 448**	2 120 258
3	**Nuclear Safety and Security**								
3.0	Overall management, coordination and common activities	913 158	-	-	2 621 943	-	-	**3 535 101**	-
3.1	Incident and Emergency Preparedness and Response	1 429 642	120 000	-	1 226 389	-	1 338 100	**4 114 131**	230 000
3.2	Safety of Nuclear Installations	8 378 811	-	-	3 194 096	142 697	4 189 400	**15 905 004**	-
3.3	Radiation and Transport Safety	5 359 314	-	-	1 602 354	637 760	6 323 600	**13 923 028**	-
3.4	Management of Radioactive Waste	6 327 422	90 000	-	1 313 869	-	12 159 800	**19 891 091**	51 500
3.5	Nuclear Security	1 107 381	-	-	79 532	15 420 510	-	**16 607 423**	-
	Major Programme 3	23 515 728	210 000	-	10 038 183	16 200 967	24 010 900	**73 975 778**	281 500
4	**Nuclear Verification**								
4.0	Overall management, coordination and common activities	1 057 670	-	-	-	-	-	**1 057 670**	-
4.1	Safeguards	112 614 837	1 315 000	-	20 912 339	-	-	**134 842 176**	5 191 713
	Major Programme 4	113 672 507	1 315 000	-	20 912 339	-	-	**135 899 846**	5 191 713
5	**Policy, Management and Administration**								
	Policy, Management and Administration	74 469 275	1 314 000	-	701 335	-	202 800	**76 687 410**	14 554 034
	Major Programme 5	74 469 275	1 314 000	-	701 335	-	202 800	**76 687 410**	14 554 034
6	**Management of Technical Cooperation for Development**								
	Management of Technical Cooperation for Development	16 241 201	312 000	-	-	-	420 800	**16 974 001**	-
	Major Programme 6	16 241 201	312 000	-	-	-	420 800	**16 974 001**	-
	Total Agency Programmes	288 829 382	4 011 000	2 406 851	35 755 622	16 200 967	101 000 000	**448 203 822**	22 902 065
	Reimbursable Work for Others	2 490 805	-	-	-	-	-	**2 490 805**	
	Total Resources	291 320 187	4 011 000	2 406 851	35 755 622	16 200 967	101 000 000	**450 694 627**	
	Source of Funds								
	Assessment on Member States	284 347 382	4 011 000	-	-	-	-	**288 358 382**	
	Income from reimbursable work for others	2 490 805	-	-	-	-	-	**2 490 805**	
	Other miscellaneous income	4 482 000	-	-	-	-	-	**4 482 000**	
	Other UN organizations	-	-	2 406 851	-	-	600 000	**3 006 851**	
	Technical Cooperation Fund	-	-	-	-	-	74 000 000	**74 000 000**	
	Extrabudgetary Programme	-	-	-	35 755 622	16 200 967	26 400 000	**78 356 589**	
	Total	291 320 187	4 011 000	2 406 851	35 755 622	16 200 967	101 000 000	**450 694 627**	

Table 3(b). Total Resource Requirements for 2009 by Programme and Major Programme

	Programme / Major Programme	Regular Budget		Extrabudgetary					
		Operational and recurrent budget at 2008 prices	Essential Investments at 2008 prices	Funds from UN Organisations	CAURBs Extrabudgetary	NSF	TC Programme	**Total**	CAURBs Unfunded
1	**Nuclear Power, Fuel Cycle and Nuclear Science**								
1.0	Overall Management, Coordination and Common Activities	901 229	-	-	-	-	-	**901 229**	-
1.1	Nuclear Power	5 655 517	-	-	2 112 929	-	3 392 400	**11 160 846**	356 000
1.2	Nuclear Fuel Cycle and Materials Technologies	2 543 474	-	-	397 177	-	1 255 900	**4 196 551**	160 251
1.3	Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	10 279 018	-	-	-	-	2 330 000	**12 609 018**	-
1.4	Nuclear Science	9 058 283	50 000	-	327 747	-	9 888 200	**19 324 230**	620 536
	Major Programme 1	28 437 521	50 000	-	2 837 853	-	16 866 500	**48 191 874**	1 136 787
2	**Nuclear Techniques for Development and Environmental Protection**								
2.0	Overall Management, Coordination and Common Activities	900 629	-	-	-	-	-	**900 629**	-
2.1	Food and Agriculture	12 202 453	190 000	2 222 267	-	-	12 977 200	**27 591 920**	1 232 000
2.2	Human Health	8 632 245	-	-	946 454	-	27 157 600	**36 736 299**	914 176
2.3	Water Resources	3 386 378	-	-	-	-	5 940 400	**9 326 778**	-
2.4	Environment	5 404 658	-	184 584	514 458	-	4 691 000	**10 794 700**	530 000
2.5	Radioisotope Production and Radiation Technology	1 969 020	-	-	-	-	9 065 200	**11 034 220**	96 000
	Major Programme 2	32 495 383	190 000	2 406 851	1 460 912	-	59 831 400	**96 384 546**	2 772 176
3	**Nuclear Safety and Security**								
3.0	Overall management, coordination and common activities	914 176	-	-	2 621 943	-	-	**3 536 119**	-
3.1	Incident and Emergency Preparedness and Response	1 410 003	20 000	-	1 262 225	-	1 408 200	**4 100 428**	130 000
3.2	Safety of Nuclear Installations	8 398 312	-	-	2 352 642	142 697	4 454 600	**15 348 251**	-
3.3	Radiation and Transport Safety	5 359 052	-	-	1 602 354	611 760	6 629 400	**14 202 566**	-
3.4	Management of Radioactive Waste	6 327 751	90 000	-	1 328 869	-	13 157 700	**20 904 320**	101 500
3.5	Nuclear Security	1 107 380	-	-	79 532	15 420 510	-	**16 607 422**	-
	Major Programme 3	23 516 674	110 000	-	9 247 565	16 174 967	25 649 900	**74 699 106**	231 500
4	**Nuclear Verification**								
4.0	Overall management, coordination and common activities	1 057 670	-	-	-	-	-	**1 057 670**	-
4.1	Safeguards	114 822 323	3 294 000	-	15 709 939	-	-	**133 826 262**	1 043 713
	Major Programme 4	115 879 993	3 294 000	-	15 709 939	-	-	**134 883 932**	1 043 713
5	**Policy, Management and Administration**								
	Policy, Management and Administration	74 469 602	1 464 000	-	701 335	-	213 500	**76 848 437**	13 418 434
	Major Programme 5	74 469 602	1 464 000	-	701 335	-	213 500	**76 848 437**	13 418 434
6	**Management of Technical Cooperation for Development**								
	Management of Technical Cooperation for Development	16 241 201	312 000	-	-	-	438 700	**16 991 901**	-
	Major Programme 6	16 241 201	312 000	-	-	-	438 700	**16 991 901**	-
	Total Agency Programmes	291 040 374	5 420 000	2 406 851	29 957 604	16 174 967	103 000 000	**447 999 796**	18 602 610
	Reimbursable Work for Others	2 501 135	-	-	-	-	-	**2 501 135**	
	Total Resources	293 541 509	5 420 000	2 406 851	29 957 604	16 174 967	103 000 000	**450 500 931**	
	Source of Funds								
	Assessment on Member States	286 558 374	5 420 000	-	-	-	-	**291 978 374**	
	Income from reimbursable work for others	2 501 135	-	-	-	-	-	**2 501 135**	
	Other miscellaneous income	4 482 000	-	-	-	-	-	**4 482 000**	
	Other UN organizations	-	-	2 406 851	-	-	600 000	**3 006 851**	
	Technical Cooperation Fund	-	-	-	-	-	78 000 000	**78 000 000**	
	Extrabudgetary Programme	-	-	-	29 957 604	16 174 967	24 400 000	**70 532 571**	
	Total	293 541 509	5 420 000	2 406 851	29 957 604	16 174 967	103 000 000	**450 500 931**	

Table 4. The Regular Budget — By Item of Expenditure

Item of Expenditure	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
Salaries - established posts - P	67 614 500	71 814 480	4 199 980	6.2%	71 864 118	49 638	0.1%	2.5%	**73 609 850**	**73 660 727**
Temporary assistance - P/MT	9 088 600	9 804 971	716 371	7.9%	9 919 809	114 838	1.2%	2.5%	**10 050 091**	**10 167 802**
Temporary assistance - P/ST	1 015 500	149 688	(865 812)	(85.3%)	149 688	-	-	2.5%	**153 430**	**153 430**
Salaries established posts - GS	33 392 527	33 145 929	(246 598)	(0.7%)	33 143 682	(2 247)	-	2.7%	**34 040 876**	**34 038 570**
Temporary assistance - GS/MT	4 054 900	4 399 711	344 811	8.5%	4 388 457	(11 254)	(0.3%)	2.7%	**4 518 499**	**4 506 941**
Temporary assistance - GS/ST	430 300	194 562	(235 738)	(54.8%)	194 562	-	-	2.7%	**199 817**	**199 817**
Common staff costs	52 107 526	53 898 714	1 791 188	3.4%	53 966 800	68 086	0.1%	3.5%	**55 770 511**	**55 840 916**
Overtime	309 600	353 667	44 067	14.2%	343 667	(10 000)	(2.8%)	2.7%	**363 217**	**352 947**
Subtotal Staff costs	168 013 453	173 761 722	5 748 269	3.4%	173 970 783	209 061	0.1%	2.8%	**178 706 291**	**178 921 150**
Travel - staff	12 022 200	12 202 568	180 368	1.5%	13 019 501	816 933	6.7%	0.8%	**12 300 193**	**13 123 660**
Travel non-staff	8 778 600	7 735 624	(1 042 976)	(11.9%)	7 467 430	(268 194)	(3.5%)	2.6%	**7 936 745**	**7 661 575**
Subtotal Travel costs	20 800 800	19 938 192	(862 608)	(4.1%)	20 486 931	548 739	2.8%	1.5%	**20 236 938**	**20 785 235**
Interpretation services	749 600	750 800	1 200	0.2%	704 800	(46 000)	(6.1%)	-	**750 800**	**704 800**
Representation and hospitality	239 800	233 804	(5 996)	(2.5%)	235 404	1 600	0.7%	2.0%	**238 371**	**240 005**
Training	978 200	1 114 873	136 673	14.0%	984 483	(130 390)	(11.7%)	2.5%	**1 142 749**	**1 009 099**
Equipment leased or rented	583 700	451 600	(132 100)	(22.6%)	451 600	-	-	3.8%	**468 822**	**468 822**
Equipment purchased	12 229 500	8 849 303	(3 380 197)	(27.6%)	9 535 190	685 887	7.8%	2.4%	**9 065 265**	**9 767 997**
Supplies and materials	6 219 200	5 316 447	(902 753)	(14.5%)	5 547 413	230 966	4.3%	4.0%	**5 530 245**	**5 769 524**
General operating costs	23 751 359	26 096 709	2 345 350	9.9%	26 196 573	99 864	0.4%	3.6%	**27 039 830**	**27 142 100**
Contracts	9 675 388	7 335 602	(2 339 786)	(24.2%)	7 526 109	190 507	2.6%	2.1%	**7 491 387**	**7 686 086**
Research and technical contracts	5 098 200	4 683 300	(414 900)	(8.1%)	4 946 600	263 300	5.6%	3.2%	**4 833 166**	**5 104 891**
Miscellaneous	3 758 700	3 307 955	(450 745)	(12.0%)	3 298 015	(9 940)	(0.3%)	2.0%	**3 373 618**	**3 363 528**
Subtotal Other direct costs	63 283 647	58 140 393	(5 143 254)	(8.1%)	59 426 187	1 285 794	2.2%	3.1%	**59 934 253**	**61 256 852**
Direct implementation costs	11 835 763	11 783 813	(51 950)	(0.4%)	11 883 816	100 003	0.8%	2.9%	**12 130 388**	**12 234 010**
Management and operation costs	4 326 800	4 514 598	187 798	4.3%	4 514 598	-	-	3.6%	**4 676 146**	**4 676 146**
Subtotal Laboratory activities	16 162 563	16 298 411	135 848	0.8%	16 398 414	100 003	0.6%	3.1%	**16 806 534**	**16 910 156**
Translation and records services	5 764 030	5 580 303	(183 727)	(3.2%)	5 579 203	(1 100)	-	2.8%	**5 733 988**	**5 732 611**
Printing services	2 165 105	2 055 112	(109 993)	(5.1%)	2 074 812	19 700	1.0%	3.2%	**2 120 637**	**2 141 096**
Data processing application services	493 192	875 367	382 175	77.5%	877 822	2 455	0.3%	3.1%	**902 467**	**904 967**
Contract administration services	648 210	645 800	(2 410)	(0.4%)	645 800	-	-	2.8%	**664 078**	**664 074**
Radiation protection and monitoring services	1 193 200	1 202 500	9 300	0.8%	1 202 500	-	-	2.9%	**1 237 043**	**1 237 043**
Medical services	959 200	985 600	26 400	2.8%	985 600	-	-	2.8%	**1 013 432**	**1 013 360**
Data processing central services for SG	1 428 600	1 428 600	-	-	1 428 600	-	-	3.2%	**1 473 721**	**1 473 830**
Subtotal Shared costs	12 651 537	12 773 282	121 745	1.0%	12 794 337	21 055	0.2%	2.9%	**13 145 366**	**13 166 981**
Operational and recurrent budget	**280 912 000**	**280 912 000**	**-**	**-**	**283 076 652**	**2 164 652**	**0.8%**	**2.8%**	**288 829 382**	**291 040 374**
Essential Investments	**-**	**4 011 000**	**4 011 000**	**-**	**5 420 000**	**1 409 000**	**35.1%**	**-**	**4 011 000**	**5 420 000**
Total Agency Programmes	**280 912 000**	**284 923 000**	**4 011 000**	**1.4%**	**288 496 652**	**3 573 652**	**1.3%**	**2.8%**	**292 840 382**	**296 460 374**
Reimbursable Work for Others	2 699 000	2 426 997	(272 003)	(10.1%)	2 436 997	10 000	0.4%	2.6%	**2 490 805**	**2 501 135**
Total Regular Budget	**283 611 000**	**287 349 997**	**3 738 997**	**1.3%**	**290 933 649**	**3 583 652**	**1.2%**	**2.8%**	**295 331 187**	**298 961 509**

I.2 Highlights of Major Programmes and Corresponding Resources

Major Programme 1: Nuclear Power, Fuel Cycle and Nuclear Science

48. Major Programme 1 provides core scientific and technological support to interested Member States in the fields of nuclear power, nuclear fuel cycle and materials technologies, capacity building and nuclear knowledge maintenance for sustainable energy development, and nuclear science. Major Programme 1 is the Agency's programmatic response to Goal A of the MTS.

49. The *Nuclear Power* programme has been expanded from five to six subprogrammes by effectively elevating the work on nuclear power infrastructure from a project to a subprogramme. Three subprogrammes, in place of the previous two, now address *Integrated Support for Operating Nuclear Facilities, Support for Expansion of Nuclear Power Plants* and *Infrastructure and Planning for the Introduction of Nuclear Power Programmes*. This change responds to rising expectations for nuclear power and increasing Member State requests for assistance in these areas. It reflects a reinforcement of emphasis on assistance to Member States interested in expanding or starting nuclear power programmes. Increased resources for these priorities are made available through efficiencies, without a decrease in the levels of services, in the subprogramme on the *International Nuclear Information System (INIS)*. The three remaining subprogrammes address the continuing priorities of evolutionary and innovative technological advances, for both electricity production and non-electric applications, e.g. desalination, hydrogen production and heat.

50. To improve effective support to operating organizations in Member States and avoid duplication in the areas of plant life management (PLiM) and long term operation (LTO) in nuclear power plants and management systems and management for safety, the resources of Major Programmes 1 and 3 were combined. Management systems/management for safety will be coordinated and implemented under Major Programme 3 and PLiM/LTO under Major Programme 1.

51. The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) continues to provide a forum to facilitate the development of innovative nuclear energy systems with increasing emphasis on collaborative projects and specific activities being supported by a larger pool of Member States, as well as on finding synergies with other international programmes.

52. The titles and emphasis of two of the four subprogrammes in the *Nuclear Fuel Cycle and Materials Technologies* programme have been adjusted to reflect increasing attention on uranium and thorium resources, and on fuels and fuel cycles for advanced and innovative reactors. These adjustments respond to the revival of the uranium industry after a slump of nearly two decades and increased interest in advanced approaches for providing services and the development of innovative fuel cycles. Such interest is also evidenced in a number of proposals for assurance of supply for nuclear fuel services through multilateral arrangements and international centres. Reflecting the priorities articulated in relevant General Conference resolutions, the emphasis in fuel cycle activities are on proliferation resistance, advanced fuels and fuel cycle options for fast reactors. Fuel development activities for high temperature gas cooled reactors (HTGRs) and small and medium sized reactors (SMRs) have also been introduced.

53. The programme on *Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development* seeks to meet the increased demand for capacity building for energy system analysis and planning as well as for nuclear information and knowledge, through improved planning and management of TC projects, better project design, increased use of distance learning and other web-based media, and increased use of regional training. Where resources prove insufficient, priority is given to providing capacity building services to Member States over continuous improvement of the Agency's methodologies and analytic tools.

54. The basic structure of the *Nuclear Science* programme remains as in 2006–2007. As part of the effort to integrate the needs of Member States and enhance synergies between the *Nuclear Power* and

the *Nuclear Fuel Cycle and Materials Technologies* programmes, increased emphasis is given to materials issues as reflected in the new title and in an additional project in the subprogramme on *Accelerators and Nuclear Spectrometry for Materials Science and Analytical Applications*. A project on operation, maintenance, availability and reliability has also been added to the subprogramme on *Research Reactors*, thus increasing its emphasis on regional cooperation. The subprogramme on *Atomic and Nuclear Data* has seen the successful completion of one major project in the 2006–2007 cycle dedicated to nuclear data for the thorium-uranium (Th–U) fuel cycle. The phasing out of this project has permitted some minor expansion in fission and fusion related data activities.

55. The adjusted structure of Major Programme 1 will support Member States in their efforts to expand the use of nuclear power through the work of the Agency's Nuclear Power Support Group (NPSG). The NPSG was established in 2006 to foster a more effective and coordinated Agency response to Member States interested in introducing and expanding the use of nuclear power.

56. In response to several Member States' interest in the clarity of priorities, Major Programme 1 introduced in 2006 the 'Nuclear Energy Series'.

57. The most notable activities from the previous cycle that have been phased out/completed and the new activities are shown below.

Programme	Phased out / completed activities
Nuclear Power	× Development of guidance for delayed nuclear power plants × Development of principles and guidelines on plant life management for light water and heavy water reactors × Development of codes and methods to reduce the calculational uncertainties of liquid metal fast reactor reactivity effects × Studies of innovative reactor technology options for effective incineration of radioactive waste × Inter-comparison of techniques for pressure tube inspection and diagnostics × Review of common enabling technologies for SMRs
Nuclear Fuel Cycle and Materials Technologies	× Development work on the Integrated Nuclear Fuel Cycle Information and Simulation Systems and on the Minor Actinide Data Base × CRP FUMEX-II on models for fuel behaviour × Activities related to data requirements and maintenance of records for spent fuel management
Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	× Guidance for the development of knowledge management systems for nuclear power plant operating organizations × Implementation of computer assisted indexing × Economic assessment of the cost effectiveness of nuclear plant modification × Country profiles for sustainable energy development
Nuclear Science	× Project on nuclear data for the Th–U fuel cycle × Activities for the improvement and maintenance of relational databases and software to permit user-friendly access to a wide range of atomic and nuclear data × Facilitating web access to evaluated neutron cross-section standards, atomic and molecular data for plasma diagnostics and for edge plasmas × Support to nuclear instrumentation maintenance × Facilitation of the International Thermonuclear Experimental Reactor (ITER) negotiations and the ITER Newsletter

Programme	New activities
Nuclear Power	♦ Strengthened activities to assist Member States that are planning to expand their existing and starting nuclear power programmes ♦ CRP on benchmark analyses of sodium natural convection in the upper plenum of the MONJU reactor vessel ♦ CRP on PHENIX end-of-life tests and expertise
Nuclear Fuel Cycle and Materials Technologies	♦ Activities related to the promotion of good practices in uranium exploration, mining and milling and environmental aspects of uranium production cycle ♦ Technical improvements in power reactor fuel design, manufacturing and quality assurance/quality control (QA/QC) to meet the requirements of high burnup and high performance ♦ Increasing activities in spent fuel reprocessing and recycling with focus on proliferation resistance ♦ Activities related to: i) innovative fuels and fuel cycles for fast reactors, HTGRs and SMRs, including those with very long life cores; and ii) better understanding of radiation damage to fuels and fuel assembly structural materials at high burnup and fast neutron fluence
Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	♦ CRP on techno-economic comparison of ultimate disposal facilities for CO_2 and for nuclear wastes ♦ Participation in the Global Energy Assessment ♦ Development and maintenance of a full-text database of Agency staff papers from non-Agency publications
Nuclear Science	♦ Project on research reactor operation, maintenance, availability and reliability ♦ Fusion based CRPs on safety and security of fusion devices; characterization of the size, composition and origins of dust in fusion devices; and nuclear data for fusion materials test facilities ♦ Analytical project on accelerator techniques for modification and analysis of materials for nuclear technologies; and special configurations and new applications of microanalytical techniques based on nuclear spectrometry ♦ CRP on: on-line monitoring systems for research reactors; innovative methods in research reactor analysis; and interaction of hydrogen with materials of importance to innovative hydrogen cycles

58. The regular budget resources (prior to price adjustments and excluding the essential investments in Table 11) for Major Programme 1 for 2008 and 2009 remain at the same level as in 2007. This has been accomplished by utilizing the savings achieved through efficiency gains, and by reprogramming the funds released from phased out or completed activities. An increase in the resources of *Overall Management, Coordination and Common Activities* reflects the needs to strengthen initiatives such as the NPSG and Nuclear Energy Series and the Continuous Improvement Group. This has been offset by a decrease in the programme for *Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development*.

59. Major Programme 1 continues to rely on extrabudgetary funds for approximately 6% of its activities, mostly for cost free experts. All the activities for INPRO are subject to the INPRO Steering Committee guidance of Phase II and the availability of extrabudgetary funds. Other activities of Major Programme 1 that remain partially or fully unfunded include development of publications on various aspects of nuclear energy, some CRPs, as well as meetings and conferences, such as the international conference on Fast Reactors and the Closed Fuel Cycle. These activities may be implemented should voluntary contributions be received or regular budget savings materialize in the course of the biennium.

60. An essential investment of €50 000 is required in 2008 and €50 000 in 2009 for the replacement of equipment at the Chemistry/Instrumentation Laboratory as described later in this document. In addition, €100 000 of replacement equipment will be purchased in 2008 and €100 000 in 2009 from the operational and recurrent portion of the regular budget.

Major Programme 2: Nuclear Techniques for Development and Environmental Protection

61. Major Programme 2 focuses on the priorities identified by the World Summit on Sustainable Development, and the relevant areas of the UN Millennium Development Goals. The major development is the introduction of the *Programme of Action for Cancer Therapy (PACT)* as a new subprogramme in the *Human Health* programme. Synergies between programmes will be exploited to achieve more efficiency in implementation. Joint actions will be taken by the *Food and Agriculture* and *Water Resources* programmes to promote water efficiency in farming systems. The *Radioisotope Production and Radiation Technology* and *Human Health* programmes will jointly address radiopharmaceutical production and use. Nutrition will be addressed jointly by *Human Health* and the *Food and Agriculture* programmes. Reference material services under the *Water Resources* and the *Environment* programmes will be provided through collaboration between the Agency's Laboratories in Seibersdorf and the Marine Environment Laboratory in Monaco, and the Isotope Hydrology Laboratory at Headquarters.

62. The *Food and Agriculture* programme will phase out activities in fertilizer evaluation and the tasks related to the characterization of mutated genes, where work will be substantially completed. The overall number of projects will decrease and the programme will provide a new focus on the rapid response to emerging diseases such as avian influenza, and also on assessing the detrimental effects of veterinary drug residues and mycotoxins for improved food safety.

63. The *Human Health* programme, particularly in the area of nuclear medicine, will place more emphasis on the management of cardiovascular diseases. It will also provide increased technical support for and be closely integrated with cancer related activities coordinated within PACT. Heart diseases and cancer control are identified as key areas where the Agency can provide increased support to Member States. Emphasis is given to an integrated approach for nutrition and infectious disease prevention and control, as well as to combating "the double burden of malnutrition". Support to the TC programme will need to be increased, in view of the 20% increase in projects over the last two biennia, a trend which continues because of the greater awareness of cancer issues. The PACT Programme Office (PPO) will coordinate a single unified programme for fundraising and the delivery of cancer related projects to Member States. The PPO will take the lead in coordinating interactions on all relevant cancer related aspects of the Secretariat's activities with Member States and organizations, such as WHO, the International Agency for Research on Cancer and the International Union Against Cancer.

64. There is a need to increase the accessibility and cost effectiveness of isotope hydrology technologies in solving current and upcoming issues of sustainable water resources management. Expanding partnerships with UNDP, the Global Environment Facility (GEF), the World Bank and other organizations will help to meet these growing demands. In this respect, there is a sizeable increase in requests by Member States for support through the TC programme to enhance their ability to measure isotopes of hydrological interest. Implementation experience from the 2004–2005 and 2006–2007 cycles has been used to restructure the programme into three subprogrammes for 2008–2009, recognizing the analytical services provided by the Isotope Hydrology Laboratory, allowing for completion of ongoing projects in a more logical manner and for designing the programmes for future cycles to address specific needs of Member States.

65. The *Environment* programme will include the harmonization of the production, certification and dispatch of matrix reference materials, which are used by Member States' laboratories for measurements for environmental assessment and management and for trade purposes. This will bring greater efficiency to activities that are carried out in all the Agency's laboratories.

66. Radioisotope products are essential for nuclear applications in medicine, industry, agriculture and the environment. There is a need for expansion of radioisotope applications and for extending the benefits to developing Member States. Industrial growth in many such Member States means that increased assistance will be needed for the production of radioisotopes and the use of nuclear and radiation technologies as well as nuclear instrumentation. Efficiency gains will be achieved through the coordination of radiopharmaceutical production activities with those in radiopharmaceutical clinical applications in the *Human Health* programme.

67. Lessons learned at the major programme level have emphasized the need to set measurable performance indicators. Many projects, particularly in human health, environment and food and agriculture, take considerably longer than one or two programme cycles to realize their full outcomes. Outputs are often needed as surrogate measures of programme performance.

68. The most notable activities from the previous cycle that have been phased out/completed and the new activities are shown below.

Programme	Phased out / completed activities
Food and Agriculture	× Activities on fertilizer evaluation × Activities encompassing certain aspects of plant breeding, genetics, soil and water management, and crop nutrition and plant insect pest control × Technologies for integrated management of natural resources in small scale dairies, and technologies for reducing risk from transboundary livestock diseases and those of veterinary public health importance × Technical input to finalize Codex guideline levels for radionuclides × CRP on irradiation to ensure the safety and quality of prepared meals × Technical input to finalize Codex guidelines related to pesticide residues × Training in preparedness and response to nuclear accidents and events × CRPs on food contaminants and veterinary drug residues × CRP on screwworm fly genetics
Human Health	× Activities on the health impact of dietary contaminants (reduced to task level) × Activities related to radioimmunoassay techniques × Activities on guidelines for treatments of certain types of cancer, and syllabi for the training of professionals in particular radiotherapy related disciplines × The Industrial Dose Assurance Service
Water Resources	× CRP to develop a network for isotope monitoring in large scale river basins × Analysis of groundwater isotope data for the mapping of fossil and non-renewable groundwater resources × Contributions to the World Hydrogeological Mapping and Assessment Programme (with UNESCO)
Environment	× ALMERA workshop for laboratories collaborating in characterization of reference materials × Workshop on sampling strategies for ALMERA network laboratories

Programme	Phased out / completed activities
	× Adapting existing radioecological transfer models to non-radioactive pollutants × Study of transfer behaviour and ecotoxicology using radioactive tracers
Radioisotope Production and Radiation Technology	× Research activities on mature nuclear analytical techniques and non-digital non-destructive examinations × CRPs on development of Tc-99m labelled small bio-molecules, control of degradation effects on radiation processing of polymers; industrial gamma tomography and wastewater treatment by radiation

Programme	New activities
Food and Agriculture	♦ New technologies in the use of the sterile insect technique (SIT): • Integration of geographical information systems (GIS) and insect pest population genetics • Assessment of X rays as a sterilization alternative to the use of radioisotope sources emitting gamma rays ♦ New applications of SIT, with increased emphasis on exotic invasive plant pests ♦ Research into polymerase chain reaction (PCR) based tools for diagnosis of zoonotic diseases, especially in the early warning of emerging diseases such as avian influenza ♦ Sustainable use and management of water for crop productivity at a watershed/catchment scale ♦ Strengthening of phytosanitary applications of food irradiation and the expansion of holistic approaches to food control, including in the area of veterinary drug residues ♦ Strengthening of inter-agency efforts towards emergency preparedness and response to nuclear and radiological emergencies affecting agriculture ♦ Use of mutation induction and supportive biotechnologies to address rising concerns related to micronutrient malnutrition, commercial sustainability and crop quality in addition to food security
Human Health	♦ Emphasis on an integrated approach for nutrition and infectious disease prevention and control, as well as to combat "the double burden of malnutrition" ♦ Research and education in diagnostic applications in cardiac diseases; single photon emission computed tomography and positron emission tomography for cancer ♦ Radiation oncology and cancer treatment being re-focused into palliative, curative and advanced treatments, based upon the lessons learned from the initial phases of PACT and its emphasis on treatment access ♦ Comprehensive approach to medical physics imaging and QA in diagnostic radiology, nuclear medicine and radiotherapy ♦ PACT
Water Resources	♦ Support to the implementation of GEF funded projects in Africa ♦ Development of regional or aquifer scale atlases and GIS maps using isotope and hydrogeological information ♦ Critical evaluation of isotope methods for dating old groundwater ♦ CRP on the evaluation of isotope and geochemical methods for estimating groundwater recharge

Programme	New activities
Environment	♦ Project on harmonization of reference materials for environment and trade ♦ Application of ocean tracers to validate ocean climate models ♦ Participation in new international (IOC/UNESCO/SCOR) programme on marine trace elements and isotopes
Radioisotope Production and Radiation Technology	♦ Development of emerging radioisotope products and generator based positron emitters for medical applications ♦ Diagnostic radiopharmaceuticals in coordination with the *Human Health* programme ♦ Joint project with the *Human Health* programme for radiopharmaceuticals development and production focused on cancer treatment ♦ Support to industrial development and analytical investigations including detection of explosives with nuclear techniques ♦ Radiation processing projects on remediation of environmental pollutants, value addition to local natural materials and synthesis of nanomaterials ♦ Project on supporting industrial process management using radioisotope and radiation techniques (activity on digital non-destructive examinations reduced and merged into this new project)

69. Despite the large number of new activities undertaken by Major Programme 2, regular budget resources (prior to price adjustment and excluding the essential investments in Table 11) remain at the same level as in 2007. This has been accomplished by decreasing activities in the programmes on *Food and Agriculture* and *Water Resources* to make funds available for the *Human Health* programme, as requested by General Conference resolutions. €617 222 has been assigned to the regular budget for PACT. Under the *Environment* programme, more funds are planned for marine environment and radioecological and isotopic solutions for coastal problems while the activities for ocean climate coupling and carbon cycling have been reduced.

70. Major Programme 2 continues to rely on extrabudgetary funding, primarily for activities carried out in cooperation with FAO and cost free experts. In addition, many CRPs remain unfunded. These activities may be implemented should voluntary contributions be received or regular budget savings materialize in the course of the biennium.

71. Essential investments for the replacement of ageing equipment in the Seibersdorf and Monaco Laboratories, and in the Isotope Hydrology Laboratory, in the amount of €810 000 in 2008 and €190 000 in 2009, are described later in this document. In addition, €150 000 of replacement equipment will be purchased in 2008 and €150 000 in 2009 from the operational and recurrent portion of the regular budget.

Major Programme 3: Nuclear Safety and Security

72. Major Programme 3 represents the Agency's support for an international effort to establish a strong, sustainable and visible global safety and security regime that contributes to protecting people and the environment from the harmful effects of ionizing radiation. The goal of such a regime is to minimize the likelihood of accidents, protect against malicious acts and mitigate the effects of any such events should they occur. Elements of this major programme reflect the Agency's statutory functions of establishing standards of safety and providing for their application to both its own operations and Member State activities upon request. The security elements of the programme respond to Board of Governors decisions and the requests of Member States for support of their measures to

prevent nuclear terrorism. Major Programme 3 is the Agency's programmatic response to Goal B of the MTS with its three objectives and strategic actions. The primary driving forces for change are: the impacts of globalization; the rising expectations for nuclear power; the increasing and advanced use of nuclear techniques in medical diagnostics and treatment; the increased attention to the protection of the environment; the management of radioactive waste and the threat of nuclear terrorism. Particular emphasis will be placed on those activities relating to an integrated safety approach which identify Member State needs, enhance synergies and avoid overlaps between major programmes. As a principal element of the integrated safety approach, the effectiveness and relevance of regional safety knowledge networks will be assessed. Additional efforts will also be made to integrate regional networks into a global safety knowledge network.

73. The *Incident and Emergency Preparedness and Response* programme, created in 2006, is part of the Agency's efforts to respond to an increasing number of requests from Member States to assist in minimizing the impact of nuclear incidents and emergencies. In view of the Agency's obligations under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention), it is of utmost importance that the Incident and Emergency Centre (IEC) broadens its scope to respond to all types of events. Reporting and knowledge sharing through networking and training will create a solid basis for prevention, early warning, and enhanced preparedness and response.

74. The *Safety of Nuclear Installations* programme continues to place great emphasis on ensuring that safety infrastructures are in place for both emerging and expanding nuclear power programmes in Member States. An effective international experience feedback programme will be enhanced to ensure that a high safety level is maintained and that recurring events are prevented and their impacts are minimized, as well as to ensure that lessons learned from them are incorporated into new design and construction projects. Industry programmes extending the life of power reactors require the Agency to actively pursue safety activities in this area. As successor to the former International Regulatory Review Team (IRRT) service, an Integrated Regulatory Review Service (IRRS) has been established to review general requirements, regulatory activities and management systems for nuclear installation safety, radiation safety, waste safety, transport safety, emergency preparedness and response, and security. Furthermore, a harmonized web-based system covering all types of nuclear installations has been developed for the collection and dissemination of information to Member States in order to share the lessons learned.

75. The coordination of activities between the Department of Nuclear Energy and the Department of Nuclear Safety and Security in the area of PLiM and LTO of nuclear power plants, and management systems is referred to under Major Programme 1.

76. The *Radiation and Transport Safety* programme has reduced the number of subprogrammes from six to four, reflecting the integration of standard development and standard application activities, leaving only two separate thematic subprogrammes on the radiological protection of patients and the safety of transport of radioactive material. The IRRS integrates the different review services, inter alia, the former Radiation Safety and Security of Radioactive Sources Infrastructure Appraisal, the Occupational Radiation Protection Appraisal Service, the Radioactive Waste Safety and Public Exposure Control Appraisal, and the Transport Safety Appraisal Service. The results of the IRRS provide recommendations for States to achieve the appropriate level of safety and protection for all types of exposure in all activities and facilities. The primary driving forces for change are the increasing and advanced use of nuclear techniques in medical diagnostics and treatment, the rising expectations for nuclear development, and the growing demand for establishing sustainable regulatory infrastructures. As denials and delays of shipments of radioactive materials may also affect the availability of critical medical and industrial supplies, actions that can be taken by the Agency will continue to have high priority. Emphasis will be put on the establishment and strengthening of national

regulatory infrastructures for radiation safety, transportation safety, radiological protection of patients, and the Code of Conduct on the Safety and Security of Radioactive Sources.

77. The primary driving forces for change in the *Management of Radioactive Waste* programme are the increased attention to the protection of the environment and the management of radioactive waste. Emphasis will therefore be put on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) and in general on building capacity in Member States on both the regulatory and the operator side. Specifically, the Agency will serve as a centre for information on radioactive waste repositories, to develop safety standards for the management of spent nuclear fuel and of radioactive waste and to provide for their application, to enhance Member State capabilities in the management of disused sealed radioactive sources and to support Member States in running and/or planning for decommissioning projects.

78. Of key importance for the future direction of the *Nuclear Security* programme is the strengthened set of international instruments that contain obligations for Member States. The Plan of Activities for Nuclear Security 2006–2009 contained in GOV/2005/50 was approved by the Board of Governors in September 2005.

79. The most notable activities from the previous cycle that have been phased out/completed as well as new activities are shown below.

Programme	Phased out / completed activities
Radiation and Transport Safety	× Intercomparison exercises (whereby individual monitoring capabilities of Member States are checked for compliance with international standards)
Management of Radioactive Waste	× Activities on stakeholder involvement in connection with radioactive waste safety identified to avoid duplication with OECD/NEA

Programme	New activities
Incident and Emergency Preparedness and Response	♦ Development of e-learning tools for end users in Member States in the area of preparedness to respond to radiation incidents and emergencies ♦ Enhancement of international medical assistance in nuclear and radiological incidents and emergencies ♦ Development of arrangements for streamlining the reporting of incidents and emergencies ♦ Establishment of an on-line radiation monitoring display capability in the IEC
Safety of Nuclear Installations	♦ Project on Safety Improvements in WWER Type Nuclear Power Plants funded by the European Commission
Management of Radioactive Waste	♦ Development and application of safety standards related to the management of spent nuclear fuel ♦ Strengthening activities related to the promotion of the Joint Convention, and regulating and remediating environments with residues from naturally occurring radioactive material

80. The structure of safety standards is being reviewed in order to keep them at a manageable number while responding to the growing needs of Member States and the expectations of expanding nuclear power and increased use of nuclear technology, particularly in the medical area.

81. The recommendations of the 2006 OIOS evaluation of Major Programme 3 regarding strengthened coordination and allocation of anticipated resources have been used throughout the preparation of the 2008–2009 programme and budget proposals. As recommended in the evaluation,

an improved results based management system will be supported by the more clearly defined programme outcomes and performance indicators.

82. The regular budget resources (prior to price adjustments and excluding the essential investments in Table 11) for Major Programme 3 remain at the same level as in 2007. Regular budget resources for the *Incident and Emergency Preparedness and Response* programme have been increased to support the expanded work scope of the IEC; however, this increase has been offset in the other programmatic areas.

83. Major Programme 3 continues to rely on extrabudgetary funds to satisfy to the extent possible the needs of Member States. A minimal amount of the *Nuclear Security* programme will be funded from the regular budget. The activities implemented under this programme will be dependent largely on voluntary contributions to the NSF.

84. Equipment for the IEC, requested as an essential investment of €120 000 in 2008 and €20 000 in 2009 as described later in this document, will contribute to the provision of around-the-clock assistance in case of any kind of a safety or security related nuclear event. An additional amount of €150 000 in 2008 and €150 000 in 2009 for this investment in the IEC will be financed from the operational and recurrent portion of the regular budget. An essential investment of €90 000 for radiation monitoring and protection services equipment is also required in 2008 and in 2009, as described later in this document, to maintain the Agency's ability to provide accurate and reliable radiation protection and monitoring services to staff members occupationally exposed to ionizing radiation as well as technical cooperation experts, fellows and trainees.

Major Programme 4: Nuclear Verification

85. Major Programme 4 relates to the Agency's statutory mandate to establish and administer safeguards. In addition, this major programme supports efforts of the international community in connection with nuclear arms control and reduction. The objectives of Major Programme 4 are based on Goal C of the MTS. Programmatic objectives aim at further enhancing the Agency's capability to adequately respond to current and future proliferation challenges. These challenges emphasize the growing importance of the Agency's ability to draw credible safeguards conclusions regarding the absence of undeclared nuclear material and activities, in addition to conclusions regarding the non-diversion of declared nuclear material from peaceful activities.

86. In order to carry out this mandate in the most effective manner, the Agency must continuously enhance its capabilities to detect undeclared nuclear material and activities through improved verification equipment, techniques and methods. The increased effectiveness of the Agency's detection capability is one of the programme's overarching goals. The advances anticipated in technical detection capabilities require that the Agency take a more active role in R&D directed at the acquisition of more sophisticated, reliable and tamper secure verification equipment. A specific project, *Novel Safeguards Verification and Detection Techniques*, is being dedicated to the development of new technologies.

87. The Agency will reinforce its efforts to have adequate and uniform legal authority in place to ensure the availability of and access to safeguards relevant information with regard to all States and thus enhance the credibility of safeguards conclusions. Consequently, the Agency will continue with its activities aimed at having comprehensive safeguards agreements (CSAs) and additional protocols (APs) in force in States, in accordance with their relevant non-proliferation undertakings. The Agency will also continue its assistance to States to enhance the competence of personnel tasked with the implementation of State obligations under CSAs and APs.

88. Under the revised small quantities protocol (SQP), States will be required to submit initial reports on their nuclear material subject to safeguards, to provide information about any existing or planned facilities, and to provide the Agency with the inspection rights as required. While the Agency does not foresee regular inspection activities in such States and therefore does not expect any measurable increase in field effort, additional analytical and evaluation work is initially anticipated and is reflected in the projects on *State Evaluation,* and *Information Support for Strengthened Safeguards*.

89. Environmental sampling has proven to be one of the most effective measures introduced under strengthened safeguards for detecting undeclared nuclear material and activities. The Agency's Safeguards Analytical Laboratory (SAL) in Seibersdorf is essential for ensuring continued nuclear material and environmental sampling analyses. The Agency therefore aims at maintaining and enhancing its capabilities in this area, including:

- Upgrading the infrastructure of the nuclear material laboratory at SAL;
- Expanding the capacity and capability to process and analyse environmental samples at SAL;
- Expanding the capacity and capability of the Network of Analytical Laboratories (NWAL) through the qualification of additional environmental sampling laboratories as part of the NWAL and/or by enhancing the capability of current network laboratories.

90. The project to re-engineer the IAEA Safeguards Information System (ISIS) was launched in 2002 to ensure the effective and efficient analysis of safeguards information. The project for the replacement of the current IT infrastructure with newly developed information architecture and associated tools is expected to be at a challenging stage of implementation during 2008–2009. The new IT infrastructure will run in parallel with the current one until the completion of the project, requiring adjustments in data management and coordination with other IT safeguards projects.

91. The most notable activities from the previous cycle that have been phased out/completed as well as new activities are shown below.

Programme	Phased out / completed activities
Verification in Iraq Pursuant to UNSC Resolutions	× Activities related to the former Programme O. On 29 June 2007, the United Nations Security Council adopted resolution 1762 (2007) which, inter alia, immediately terminated the mandate of the IAEA in Iraq under relevant resolutions. Routine safeguards activities in Iraq are now included in Project 4.1.1.1 under the regular budget.

Programme	New activities
Safeguards	♦ A project related to the analysis of trade in nuclear technology and materials, initiated in 2004, aims at improving the Agency's understanding of known nuclear-related procurement networks and at detecting or uncovering presently unknown nuclear trade networks ♦ A project on *novel safeguards verification and detection techniques* has been incorporated to ensure the timely availability of the most appropriate and effective novel techniques, methods and instruments for the detection of undeclared nuclear materials and activities, in particular those required for complementary access and unannounced activities

92. A new internal process for reviewing State-level integrated safeguards approaches has been in use since 2005, resulting in integrated safeguards being implemented faster in key States. The introduction of integrated safeguards in States with large nuclear programmes has provided a unique opportunity to design and implement tailor made efficient safeguards methods and approaches at different types of facilities. For instance, a new, less labour intensive safeguards approach for

verification of the transfer of spent fuel to dry storage installations has been field tested and is expected to substantially reduce the time during which inspectors need to be physically present during such transfers.

93. The implementation of integrated safeguards has resulted in efficiency gains which to date translate to savings of approximately 10% of the inspections. The extent of savings differs in each State, depending on the size of the nuclear programme, the type of facility, the integrated safeguards approaches used and other State specific factors. Savings made so far have been used to finance increasing activities at Headquarters, related to the introduction of new facilities and State evaluations, and additional measures in the field such as complementary access.

94. The need for inspector presence in the field has also been reduced through other measures, such as unattended monitoring systems. By the end of 2006, there were 129 surveillance and radiation monitoring systems with remote transmission capabilities: 87 surveillance systems with 320 cameras in 14 States and in Taiwan, China; and 42 unattended radiation monitoring systems in eight States.

95. Efficiencies and productivity improvements of the safeguards system will continue to be pursued through the implementation of a quality management system which was established in 2004.

96. The regular budget resources for 2008 (prior to price adjustments and excluding the essential investments in Table 11) for Major Programme 4 remain at the same level as in 2007. The increase of €2.2 million in 2009 as compared to 2008 is due to the monitoring and verification activities in the Democratic People's Republic of Korea (DPRK). Substantive efficiencies and savings have been achieved through integrated safeguards, as mentioned above, and are reflected in a decrease in inspections in States with CSAs and an AP in force. Some of these resources have been used to strengthen the analytical work of the major programme in the IT area and concepts and planning. However, important challenges remain ahead to be able to finance new and expanding activities with reliable and predictable funding sources.

97. The Agency may start implementing safeguards at several additional facilities in India (used for the civilian nuclear programme) as early as 2008, as a result of the separation plan agreed between India and the USA on 18 July 2006. Implementation of safeguards is expected, inter alia, at four on-load reactors by 2010 (two reactors in 2008 and another two in 2010). These verification activities will require significant additional human and material resources. Funding for these activities has not been included in the regular budget. The Board agreed at its July 2007 meeting to recommend a supplementary appropriation to the regular budget for 2008 to finance these verification activities should they commence in 2008.

98. It is possible that safeguards will be implemented at a new enrichment plant in the USA as of 2007 and at a new enrichment facility in France which is currently at the planning and development stage. The Secretariat has been informed that the facility in France could possibly start operation in 2009. In that context, the Agency's safeguards verification activities in nuclear-weapon States are being reviewed.

99. Activities related to safeguarding the Rokkasho Reprocessing Plant in Japan will continue to require significant resources. This includes verification activities and the maintenance of facility-related IT infrastructure and applications as well as plant-specific safeguards instrumentation and equipment infrastructure.

100. The resources required for the development and implementation of a safeguards approach for a large automated mixed oxide fuel fabrication plant in Japan will be significant in the period 2007–2010. Construction of the plant will commence in 2007 and commercial operation is expected to start in 2011–2012.

101. The implementation of the Initial Actions regarding the verification work to be implemented with respect to the nuclear programme of the DPRK is estimated at €2.2 million in 2008. This amount is shown as CAURBs unfunded and voluntary contributions have been requested. Assuming that the level of monitoring and verification activities agreed between the DPRK and the Agency remain at the same level as in 2008, €2.2 million have been included in the regular budget in 2009. The Agency's work on the Chernobyl conditioning facility, expected to require €1.8 million in 2008, remains mostly unfunded. Development and installation work is expected to recommence after infrastructure design modifications. The facility may be commissioned at the earliest at the end of 2009.

102. The reliance on extrabudgetary funds will significantly increase during the biennium, as compared with the previous two biennia, to meet programmatic activities related to, inter alia, the development of the next generation surveillance system to replace the present digital surveillance system.

103. Essential investments of €1 315 000 in 2008 and €3 294 000 in 2009 are needed to support this major programme in the acquisition of safeguards verification equipment and instrumentation, as well as for the construction of a highly secure computer centre, as described later in this document. An additional amount of €1.7 million in 2008 and €2.2 million in 2009 for the equipment listed as an essential investment will be financed out of the operational and recurrent portion of the regular budget.

Major Programme 5: Policy, Management and Administration

104. Major Programme 5 combines the functions previously grouped in two major programmes — relating to policy, general management and information support services. These functions are concerned with leadership, under the authority of the Director General, for all Agency activities providing the essential coordination to ensure a one house approach particularly with respect to overall policies, interactions with Member States, development of programmes and evaluation and assessment of performance. They also provide the necessary support in terms of legal, financial, personnel, procurement and general services to those directly engaged in the implementation of the Agency's programme. Finally, they deal with the management and interchange of information within the Secretariat, and between the Secretariat and Member States, the media and the general public.

105. An important undertaking, essential to more effective functioning of the Secretariat, has been introduced under the *ICT Solutions* subfunction to plan and implement an Agency-wide information system for programme support. Having a modern, integrated programme support system will markedly enhance the capacity for management reform and, at the same time, support the introduction of the new International Public Sector Accounting Standards (IPSAS). Such a system is critical for the Secretariat to effectively plan, manage and account for the core activities in its mandate, and to support the increasing demands for transparency, accountability and reliability of the business processes. The information system would integrate the handling of financial, human resources, procurement, programme and project management and other operational support processes so as to provide a single, reliable source of all necessary information for managers to discharge their responsibility, and eliminate duplication of effort. The funding for the system is shown as a CAURB.

106. Preparations for the introduction in the Agency of IPSAS are covered under a new activity in *Financial Policy Coordination and Systems Support*.

107. An important objective in Major Programme 5 is to look continuously for ways to increase efficiency and transparency, and to deal with the increasing workload resulting from the growth of the substantive programmes, without a corresponding increase in funding for Major Programme 5. In addition to the proposed Agency-wide information system for programme support, greater streamlining is being introduced in a number of areas such as travel claim processing and the

preparation of documents for the Policy-making Organs. The process of preparing the programme and budget has also been further streamlined, particularly through the use by managers of the online Programme and Budget Information System (PROBIS). Another cost reduction measure under consideration is to reduce the number of hard copies of multiple correspondence and the number of free publications given to Member States, given the ease of electronic access to these sources of information.

108. Further simplification and modernization of *Conference, Languages and Publishing Services* will take place in 2008–2009. The function will henceforward have only three subfunctions corresponding to the three main areas indicated by its name. Publishing, printing and distribution activities will be merged into a single operation to improve efficiency and effectiveness.

109. Emphasis in the personnel area will be given to the establishment of more strategic human resources plans, enhanced job descriptions, and leadership and management development. Attention will also be given to performance management, personnel policy review and the administration of justice. The challenges that the Agency will face during the biennium include the development of a performance based pay system that reflects recent changes in the United Nations common system, and strengthening of a competency based recruitment system.

110. The distribution within the Secretariat of official correspondence will be carried out electronically using the Agency's document management system rather than via hard copies, thus permitting more rapid transmission and central archiving.

111. The regular budget resources (prior to price adjustments and excluding the essential investments in Table 11) for Major Programme 5 remain at the same level as in 2007. However, major challenges remain in financing activities for which no funding has yet been identified, particularly in the areas of information systems, IT and facilities management:

- The project for the Agency-wide information system for programme support consists of four phases and the total costs are estimated at €24 million for the period 2008–2011. The first two phases are planned for the 2008–2009 biennium at a total cost of €8.4 million in 2008 and €7.5 million in 2009.
- The Equipment Replacement Fund 2009 (ERF-2009) as recommended in GOV/2005/29 and approved by the Board of Governors in June 2005 for financing major items of the IT infrastructure, will require €1.2 million annually to reach the needed €4.8 million in 2009.
- Engineering and architectural changes concerning the Seibersdorf Laboratories, and continuous needs for the management of the facilities at Headquarters, will require €3.9 million annually[5].

112. Essential investments of €1 314 000 in 2008 and €1 464 000 in 2009 required for the infrastructure facilities at the Vienna International Centre (VIC) and for the implementation of IPSAS are described later in this document. An additional amount of €350 000 in 2008 and €350 000 in 2009 for the VIC infrastructure facilities will be funded from the operational and recurrent portion of the regular budget.

Major Programme 6: Management of Technical Cooperation for Development

113. In order for the Agency to make continuous progress towards achieving its statutory objective "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout

[5] This is in addition to the equipment related essential investments for the Seibersdorf Laboratories.

the world", this major programme ensures competence and direction for planning, designing and implementing the TC programme. This work involves intensive interaction with a wide spectrum of counterparts, both internal and external, the building of strategic and financial partnerships with intergovernmental and non-governmental organizations, and active resource mobilization efforts. In addition, specialist knowledge and skills in quality management and communication are necessary. One of the fundamental challenges affecting this interaction is the increased workload generated by the continuous growth in the number of developing countries joining the Agency.

114. Technical cooperation is a dynamic process that regularly increases in size and complexity, requiring improved effectiveness and innovation from management. An important step in this direction is the introduction of the Programme Cycle Management Framework (PCMF) with its supporting IT platform and other management initiatives. Furthermore, the establishment of four regional divisions has helped to improve quality and enhance responsiveness to Member State needs and priorities, mainly by strengthening the working relationships with Member State authorities and regional agreements. More effective programme delivery also requires increased utilization of existing capabilities in Member States, promotion of South–South cooperation and strengthened coordination with other United Nations organizations.

115. Major Programme 6 comprises one main function and five subfunctions reflecting a close alignment with its organizational structure and strengthened operational relationships with Member States:

Function: *Management of the Technical Cooperation Programme*

Subfunction 1: *Management of the TC programme for Africa*
Subfunction 2: *Management of the TC programme for Asia and the Pacific*
Subfunction 3: *Management of the TC programme for Europe*
Subfunction 4: *Management of the TC programme for Latin America*
Subfunction 5: *Coordination support and strategic direction for the TC programme*

116. For 2008–2009, special attention will be given to enhance participation of Member States as strategic partners. There will be an increased focus in Africa on least developed countries, particularly through the promotion of technical cooperation among developing countries (TCDC) and South–South cooperation mechanisms and the utilization of advanced national institutions and regional resource centres, with the Country Programme Framework (CPF) process providing the essential function of ensuring that proposed projects are well integrated within national programmes and planning. Special efforts will also be made to strengthen the relationship with the New Partnership for Africa's Development (NEPAD) and other regional international organizations.

117. In the Asia and Pacific region, management will focus on enhancing capacities, particularly strengthening existing advanced national institutions and regional resource centres, so that services and products can be provided from within the region. Programme priorities will include comprehensive nuclear power planning, infrastructure strengthening and integrated management of nuclear power plants, with special emphasis on safety and security.

118. In Europe, an important focus of management will be maintaining safety standards in older nuclear power plants and mitigating environmental degradation. Another important management challenge will be to optimize the use and sharing of resources and capacity within the region.

119. One of the most important management challenges for the Latin America region will be to provide support for strategic planning capabilities to facilitate the transition of national nuclear institutions that have been privatized. With a growing number of national institutions in the region equalling the Agency in technical expertise, special effort will be made to encourage Member States to share experience, provide leadership and fully meet their financial obligations to the TC programme.

120. The recommendations and observations of oversight authorities and the Standing Advisory Group on Technical Assistance and Cooperation (SAGTAC) have had a major influence on the formulation of Major Programme 6. In particular, for the forthcoming biennium, management will focus on sustaining the outcomes of TC projects by planning and identifying the steps and resources necessary for project counterparts to expand and sustain the benefits of technical cooperation. Implementing the CPF process as a strategic and cross-cutting mechanism is a recommendation of both the oversight authorities and SAGTAC, and is intended to better integrate Agency planning processes and enhance mutual understanding of Member State priorities, interests and needs. To facilitate implementation of this recommendation, new CPF guidelines have been introduced that reflect this approach. The 2008–2009 programme and budget for Major Programme 6 is designed to fully support the Agency's objectives set out in the MTS.

121. The regular budget resources (prior to price adjustments and excluding the essential investments in Table 11) for Major Programme 6 remain at the same level as in 2007. A continuously expanding TC programme with increased quality and a growing number of Member States pose challenges for the management of the programme. With no increase in the operational and recurrent portion of the regular budget, efforts will be devoted to minimizing possible adverse impact in the following areas: delivery levels in the TC programme; quality in the programme; number of projects formulated for the TC programme 2009–2011; implementation and development of new initiatives such as PCMF; communication strategy; and mapping and utilization of Member State capacities. The Secretariat will make every effort to continue to meet these challenges through efficiency gains, particularly those derived from the organizational restructuring.

122. An essential investment of €312 000 is required in 2008 and €312 000 in 2009 to support the interactive IT environment of this major programme, as described later in this document. In addition, €50 000 for this project in 2008 and €50 000 in 2009 will be financed from the operational and recurrent portion of the regular budget.

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 5

	Subprogramme / Programme	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
1.0.0.1	Overall Management, Coordination and Common Activities	705 918	877 173	171 255	24.3%	877 173	-	-	2.7%	**901 233**	**901 229**
		705 918	**877 173**	**171 255**	**24.3%**	**877 173**	-	-	**2.7%**	**901 233**	**901 229**
1.1.1	Integrated Support for Operating Nuclear Facilities	1 781 463	1 570 742	(210 721)	(11.8%)	1 575 374	4 632	0.3%	2.7%	**1 613 730**	**1 618 366**
1.1.2	Support for Expansion of Nuclear Power Plants	683 033	893 367	210 334	30.8%	893 367	-	-	2.8%	**917 970**	**917 970**
1.1.3	Infrastructure and Planning for the Introduction of Nuclear Power Programmes	444 618	531 343	86 725	19.5%	526 711	(4 632)	(0.9%)	2.7%	**545 634**	**540 945**
1.1.4	Coordination of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)	317 700	372 553	54 853	17.3%	372 553	-	-	2.9%	**383 328**	**383 328**
1.1.5	Technology Development for Advanced Reactor Lines	1 609 122	1 655 428	46 306	2.9%	1 650 429	(4 999)	(0.3%)	2.7%	**1 700 213**	**1 695 001**
1.1.6	Support for Non-electric Applications of Nuclear Power	528 522	481 844	(46 678)	(8.8%)	486 843	4 999	1.0%	2.7%	**494 638**	**499 907**
Programme 1.1 - Nuclear Power		**5 364 458**	**5 505 277**	**140 819**	**2.6%**	**5 505 277**	-	-	**2.7%**	**5 655 513**	**5 655 517**
1.2.1	Uranium Resources and Production and Databases for the Nuclear Fuel Cycle	759 146	775 648	16 502	2.2%	798 148	22 500	2.9%	2.7%	**796 799**	**820 093**
1.2.2	Nuclear Power Reactor Fuel Engineering	569 200	551 699	(17 501)	(3.1%)	540 699	(11 000)	(2.0%)	2.7%	**566 623**	**555 239**
1.2.3	Management of Spent Fuel from Nuclear Power Reactors	541 400	539 230	(2 170)	(0.4%)	506 330	(32 900)	(6.1%)	2.8%	**554 204**	**520 201**
1.2.4	Topical Issues of Nuclear Fuels and Fuel Cycles for Advanced and Innovative Reactors	606 032	609 201	3 169	0.5%	630 601	21 400	3.5%	2.8%	**625 967**	**647 941**
Programme 1.2 - Nuclear Fuel Cycle and Materials Technologies		**2 475 778**	**2 475 778**	-	-	**2 475 778**	-	-	**2.7%**	**2 543 593**	**2 543 474**
1.3.1	Energy Modelling, Data and Capacity Building	1 391 123	1 504 059	112 936	8.1%	1 504 059	-	-	2.7%	**1 544 383**	**1 544 384**
1.3.2	Energy Economy Environment (3E) Analysis	1 392 000	1 154 811	(237 189)	(17.0%)	1 154 811	-	-	2.6%	**1 185 221**	**1 185 223**
1.3.3	Nuclear Knowledge Management	1 666 300	1 775 384	109 084	6.5%	1 805 884	30 500	1.7%	2.7%	**1 823 805**	**1 855 194**
1.3.4	International Nuclear Information System (INIS)	3 162 458	2 865 547	(296 911)	(9.4%)	2 835 047	(30 500)	(1.1%)	2.8%	**2 945 825**	**2 914 724**
1.3.5	Library and Information Support	2 674 905	2 674 911	6	-	2 674 911	-	-	3.9%	**2 779 493**	**2 779 493**
Programme 1.3 - Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development		**10 286 786**	**9 974 712**	**(312 074)**	**(3.0%)**	**9 974 712**	-	-	**3.0%**	**10 278 727**	**10 279 018**
1.4.1	Atomic and Nuclear Data	2 465 217	2 465 217	-	-	2 465 217	-	-	2.7%	**2 532 953**	**2 533 073**
1.4.2	Research Reactors	950 744	950 744	-	-	950 744	-	-	2.7%	**976 135**	**976 468**
1.4.3	Accelerators and Nuclear Spectrometry for Materials Science and Analytical Applications	2 568 100	2 568 100	-	-	2 568 100	-	-	3.0%	**2 644 618**	**2 644 696**
1.4.4	Nuclear Fusion Research	549 500	549 500	-	-	549 500	-	-	2.7%	**564 452**	**564 484**
1.4.5	Support to ICTP	2 289 200	2 289 200	-	-	2 289 200	-	-	2.2%	**2 339 562**	**2 339 562**
Programme 1.4 - Nuclear Science		**8 822 761**	**8 822 761**	-	-	**8 822 761**	-	-	**2.7%**	**9 057 720**	**9 058 283**
Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science		**27 655 701**	**27 655 701**	-	-	**27 655 701**	-	-	**2.8%**	**28 436 786**	**28 437 521**

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 6

	Subprogramme / Programme	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
2.0.0.1	Overall Management, Coordination and Common Activities	766 731	879 141	112 410	14.7%	876 577	(2 564)	(0.3%)	2.8%	**903 350**	**900 629**
		766 731	**879 141**	**112 410**	**14.7%**	**876 577**	**(2 564)**	**(0.3%)**	**2.8%**	**903 350**	**900 629**
2.1.1	Sustainable Intensification of Crop Production Systems	4 877 670	4 628 091	(249 579)	(5.1%)	4 515 491	(112 600)	(2.4%)	3.0%	**4 766 674**	**4 651 788**
2.1.2	Sustainable Intensification of Livestock Production Systems	1 997 776	2 207 966	210 190	10.5%	2 154 966	(53 000)	(2.4%)	3.0%	**2 273 503**	**2 219 134**
2.1.3	Improving Food and Environmental Safety	1 732 502	1 636 065	(96 437)	(5.6%)	1 948 143	312 078	19.1%	2.9%	**1 684 308**	**2 006 054**
2.1.4	Sustainable control of major insect pests	3 647 442	3 374 134	(273 308)	(7.5%)	3 228 634	(145 500)	(4.3%)	3.0%	**3 475 000**	**3 325 477**
Programme 2.1 - Food and Agriculture		**12 255 390**	**11 846 256**	**(409 134)**	**(3.3%)**	**11 847 234**	**978**	**-**	**3.0%**	**12 199 485**	**12 202 453**
2.2.1	Nutrition and Infectious Disease Prevention and Control	2 124 157	2 251 789	127 632	6.0%	2 299 264	47 475	2.1%	2.9%	**2 316 233**	**2 364 907**
2.2.2	Nuclear Medicine and Diagnostic Imaging	1 768 226	1 526 715	(241 511)	(13.7%)	1 543 914	17 199	1.1%	2.9%	**1 570 478**	**1 588 181**
2.2.3	Radiation Oncology and Cancer Treatment	1 712 321	1 734 020	21 699	1.3%	1 669 283	(64 737)	(3.7%)	2.9%	**1 783 586**	**1 717 281**
2.2.4	Quality Assurance and Metrology in Radiation Medicine	2 340 701	2 277 467	(63 234)	(2.7%)	2 279 117	1 650	0.1%	2.9%	**2 342 803**	**2 344 648**
2.2.5	Programme of Action for Cancer Therapy (PACT)	-	600 245	600 245	-	600 244	(1)	-	2.8%	**617 222**	**617 228**
Programme 2.2 - Human Health		**7 945 405**	**8 390 236**	**444 831**	**5.6%**	**8 391 822**	**1 586**	**-**	**2.9%**	**8 630 322**	**8 632 245**
2.3.1	Sustainable Water Use and Services	382 900	636 805	253 905	66.3%	627 405	(9 400)	(1.5%)	2.7%	**653 852**	**644 245**
2.3.2	Isotope Methods for the Improved Understanding of the Water Cycle	2 205 117	1 351 648	(853 469)	(38.7%)	1 361 048	9 400	0.7%	2.8%	**1 389 049**	**1 398 509**
2.3.3	Analytical Services for Isotope Hydrology	790 600	1 305 161	514 561	65.1%	1 305 161	-	-	2.9%	**1 343 576**	**1 343 624**
Programme 2.3 - Water Resources		**3 378 617**	**3 293 614**	**(85 003)**	**(2.5%)**	**3 293 614**	**-**	**-**	**2.8%**	**3 386 477**	**3 386 378**
2.4.1	Marine Environmental and Radiological Assessment (MERA)	1 464 200	1 566 363	102 163	7.0%	1 543 363	(23 000)	(1.5%)	2.9%	**1 612 418**	**1 588 639**
2.4.2	Radioecological and Isotopic Solutions for Coastal Marine Problems (RISCMAR)	1 115 200	1 303 551	188 351	16.9%	1 363 880	60 329	4.6%	2.9%	**1 341 355**	**1 403 021**
2.4.3	Ocean Climate Coupling and Carbon Cycling (OC4)	964 900	629 390	(335 510)	(34.8%)	592 061	(37 329)	(5.9%)	3.0%	**647 994**	**609 491**
2.4.4	Supporting Analytical Laboratory Performance	957 600	1 020 212	62 612	6.5%	1 020 212	-	-	3.1%	**1 051 496**	**1 051 543**
2.4.5	Sustainable Management of the Terrestrial Environment	735 800	729 298	(6 502)	(0.9%)	729 298	-	-	3.1%	**751 932**	**751 964**
Programme 2.4 - Environment		**5 237 700**	**5 248 814**	**11 114**	**0.2%**	**5 248 814**	**-**	**-**	**3.0%**	**5 405 195**	**5 404 658**
2.5.1	Development of Radioisotope Products for Medical and Industrial Applications	900 431	791 382	(109 049)	(12.1%)	805 382	14 000	1.8%	2.7%	**813 134**	**827 539**
2.5.2	Radiation technology support for cleaner industrial processes and material analysis and development	1 089 900	1 124 731	34 831	3.2%	1 110 731	(14 000)	(1.2%)	2.8%	**1 155 922**	**1 141 481**
Programme 2.5 - Radioisotope Production and Radiation Technology		**1 990 331**	**1 916 113**	**(74 218)**	**(3.7%)**	**1 916 113**	**-**	**-**	**2.8%**	**1 969 056**	**1 969 020**
Major Programme 2 - Nuclear Techniques for Development and Environmental Protection		**31 574 174**	**31 574 174**	**-**	**-**	**31 574 174**	**-**	**-**	**2.9%**	**32 493 885**	**32 495 383**

Major Programme 3 - Nuclear Safety and Security

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 7

	Subprogramme / Programme	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
3.0.0.1	Overall management, coordination and common activities	930 990	888 990	(42 000)	(4.5%)	889 990	1 000	0.1%	2.7%	**913 158**	**914 176**
		930 990	**888 990**	**(42 000)**	**(4.5%)**	**889 990**	**1 000**	**0.1%**	**2.7%**	913 158	914 176
3.1.1	Enhancing Member State Preparedness and Response Capabilities	517 259	696 058	178 799	34.6%	710 848	14 790	2.1%	2.7%	**714 915**	**729 900**
3.1.2	Enhancing Preparedness and Response Capabilities of International Organizations	594 071	695 122	101 051	17.0%	661 332	(33 790)	(4.9%)	2.8%	**714 727**	**680 103**
Programme 3.1 - Incident and Emergency Preparedness and Response		**1 111 330**	**1 391 180**	**279 850**	**25.2%**	**1 372 180**	**(19 000)**	**(1.4%)**	**2.8%**	**1 429 642**	**1 410 003**
3.2.1	National Regulatory Framework and Approaches to Enhance Regulatory Effectiveness	882 121	819 431	(62 690)	(7.1%)	846 531	27 100	3.3%	2.8%	**842 254**	**869 976**
3.2.2	National and Global Nuclear Safety Programme Enhancements	2 263 143	2 069 713	(193 430)	(8.5%)	1 992 833	(76 880)	(3.7%)	2.7%	**2 126 122**	**2 048 457**
3.2.3	Development and Use of Advanced Safety Assessment: Methods and Applications	1 157 202	1 472 438	315 236	27.2%	1 456 238	(16 200)	(1.1%)	2.8%	**1 513 521**	**1 496 869**
3.2.4	Engineering Safety for Site Evaluation, Desigr and Long Term Operation	1 114 876	1 128 514	13 638	1.2%	1 153 914	25 400	2.3%	2.8%	**1 160 008**	**1 186 027**
3.2.5	Operational Safety and Effective International Operating Experience Feedback	1 641 302	1 597 423	(43 879)	(2.7%)	1 626 403	28 980	1.8%	2.8%	**1 641 674**	**1 671 424**
3.2.6	Safety of Research Reactors and Fuel Cycle Facilities	1 218 800	1 065 656	(153 144)	(12.6%)	1 095 256	29 600	2.8%	2.8%	**1 095 232**	**1 125 559**
Programme 3.2 - Safety of Nuclear Installations		**8 277 444**	**8 153 175**	**(124 269)**	**(1.5%)**	**8 171 175**	**18 000**	**0.2%**	**2.8%**	**8 378 811**	**8 398 312**
3.3.1	Developing Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources	1 899 957	1 785 965	(113 992)	(6.0%)	1 785 965	-	-	2.8%	**1 835 315**	**1 835 271**
3.3.2	Strengthening Regulatory Infrastructure and Harmonizing the Application of the Radiation Safety Standards	1 965 026	2 008 526	43 500	2.2%	2 008 526	-	-	2.8%	**2 064 527**	**2 064 458**
3.3.3	Radiological Protection of Patients	570 300	655 630	85 330	15.0%	655 630	-	-	2.8%	**673 712**	**673 654**
3.3.4	Safety of the Transport of Radioactive Material	827 266	765 006	(62 260)	(7.5%)	765 006	-	-	2.7%	**785 760**	**785 669**
Programme 3.3 - Radiation and Transport Safety		**5 262 549**	**5 215 127**	**(47 422)**	**(0.9%)**	**5 215 127**	**-**	**-**	**2.8%**	**5 359 314**	**5 359 052**
3.4.1	Development of an International Safety Regime for the Management of Radioactive Waste	1 215 755	1 106 095	(109 660)	(9.0%)	1 097 795	(8 300)	(0.8%)	2.7%	**1 136 322**	**1 127 813**
3.4.2	Management and Disposal of all Types of Radioactive Waste	2 945 162	2 962 326	17 164	0.6%	2 919 326	(43 000)	(1.5%)	2.8%	**3 044 618**	**3 000 622**
3.4.3	Assessment and Control of Radioactive Discharges to the Environment	773 566	824 276	50 710	6.6%	833 276	9 000	1.1%	2.7%	**846 673**	**855 861**
3.4.4	Decommissioning of Installations and Remediation of Sites	1 240 239	1 265 866	25 627	2.1%	1 308 166	42 300	3.3%	2.7%	**1 299 809**	**1 343 455**
Programme 3.4 - Management of Radioactive Waste		**6 174 722**	**6 158 563**	**(16 159)**	**(0.3%)**	**6 158 563**	**-**	**-**	**2.7%**	**6 327 422**	**6 327 751**
3.5.1	Assessing Nuclear Security Needs, Threat Analysis and Coordination	387 000	422 090	35 090	9.1%	422 090	-	-	2.7%	**433 621**	**433 620**
3.5.2	Preventing Malicious Activities Involving Nuclear and Radioactive Materials and their Associated Facilities	512 100	440 682	(71 418)	(13.9%)	440 682	-	-	2.8%	**452 946**	**452 946**
3.5.3	Detecting and Responding to Malicious Activities involving Nuclear and other Radioactive Material	228 500	214 828	(13 672)	(6.0%)	214 828	-	-	2.8%	**220 814**	**220 814**
Programme 3.5 - Nuclear Security		**1 127 600**	**1 077 600**	**(50 000)**	**(4.4%)**	**1 077 600**	**-**	**-**	**2.8%**	**1 107 381**	**1 107 380**
Major Programme 3 - Nuclear Safety and Security		**22 884 635**	**22 884 635**	**-**	**-**	**22 884 635**	**-**	**-**	**2.8%**	**23 515 728**	**23 516 674**

Major Programme 4 - Nuclear Verification

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 8

	Subprogramme / Programme	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
4.0.0.1	Overall management, coordination and common activities	1 011 800	1 029 586	17 786	1.8%	1 029 586	-	-	2.7%	**1 057 670**	**1 057 670**
		1 011 800	**1 029 586**	**17 786**	**1.8%**	**1 029 586**	**-**	**-**	**2.7%**	**1 057 670**	**1 057 670**
4.1.1	Operations	72 942 409	70 501 884	(2 440 525)	(3.3%)	72 316 413	1 814 529	2.6%	2.6%	**72 312 940**	**74 161 511**
4.1.2	Development and Support	36 823 200	39 245 939	2 422 739	6.6%	39 596 062	350 123	0.9%	2.7%	**40 301 897**	**40 660 812**
Programme 4.1 - Safeguards		**109 765 609**	**109 747 823**	**(17 786)**	**-**	**111 912 475**	**2 164 652**	**2.0%**	**2.6%**	**112 614 837**	**114 822 323**
Major Programme 4 - Nuclear Verification		**110 777 409**	**110 777 409**	**-**	**-**	**112 942 061**	**2 164 652**	**2.0%**	**2.6%**	**113 672 507**	**115 879 993**

Major Programme 5 - Policy, Management and Administration

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 9

	Functions	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
5.0.1	Executive Leadership and Policy	11 613 872	11 780 080	166 208	1.4%	11 780 080	-	-	2.6%	**12 081 153**	**12 081 010**
5.0.2	Legal Services	2 261 414	2 261 414	-	-	2 261 414	-	-	2.5%	**2 318 559**	**2 318 551**
5.0.3	Oversight services	1 759 602	1 635 194	(124 408)	(7.1%)	1 635 194	-	-	2.6%	**1 677 992**	**1 677 991**
5.0.4	Public information and communications	3 400 145	3 330 968	(69 177)	(2.0%)	3 338 226	7 258	0.2%	2.7%	**3 422 558**	**3 429 879**
5.0.5	Information and Communication Technology	8 739 299	8 728 299	(11 000)	(0.1%)	8 728 299	-	-	2.8%	**8 973 243**	**8 973 695**
5.0.6	Financial Management and Services	6 847 430	6 847 430	-	-	6 847 430	-	-	2.9%	**7 043 900**	**7 043 896**
5.0.7	Human Resources Management	5 924 378	5 924 378	-	-	5 924 378	-	-	2.7%	**6 086 609**	**6 086 538**
5.0.8	General Services	26 537 912	26 576 289	38 377	0.1%	26 569 031	(7 258)	-	3.7%	**27 571 092**	**27 563 975**
5.0.9	Conference, Languages and Publishing Services	5 144 525	5 144 525	-	-	5 144 525	-	-	2.9%	**5 294 169**	**5 294 067**
Major Programme 5 - Policy, Management and Administration		**72 228 577**	**72 228 577**	**-**	**-**	**72 228 577**	**-**	**-**	**3.1%**	**74 469 275**	**74 469 602**

Major Programme 6 - Management of Technical Cooperation for Development

Summary of Regular Budget Resources for the Biennium

(excluding Essential Investments)

Table 10

	Functions	2007 adjusted budget	2008 estimates at 2007 prices	Variance 2008 over 2007 €	%	2009 estimates at 2007 prices	Variance 2009 over 2008 €	%	Price Increase	**2008 estimates at 2008 prices**	**2009 estimates at 2008 prices**
6.0.1	Management of the technical cooperation programme	15 791 504	15 791 504	-	-	15 791 504	-	-	2.8%	**16 241 201**	**16 241 201**
Major Programme 6 - Management of Technical Cooperation for Development		**15 791 504**	**15 791 504**	**-**	**-**	**15 791 504**	**-**	**-**	**2.8%**	**16 241 201**	**16 241 201**

I.3 Essential Investments for 2008–2009

Table 11. Essential Investments for 2008–2009 at 2008 prices

	2008	2009
A. Agency's Laboratories		
Replacement of ageing equipment in the Chemistry/Instrumentation Laboratory ***(Major Programme 1)***	50 000	50 000
Replacement of ageing equipment in the Seibersdorf and Monaco Laboratories, and in the Isotope Hydrology Laboratory ***(Major Programme 2)***	810 000	190 000
B. Incident and Emergency Centre (Major Programme 3)		
Improved infrastructure for the IEC	120 000	20 000
C. Radiation Protection and Monitoring Services (Major Programme 3)		
Replacement of equipment for the radiation protection and monitoring services	90 000	90 000
D. Safeguards Activities (Major Programme 4)		
Equipment required for newly safeguarded facilities	1 315 000	2 544 000
E. Agency Computer Centre (Major Programme 4)		
Construction of a secure Agency-wide Computer Centre	—	750 000
F. Infrastructure facilities at the VIC (Major Programme 5)		
UNIDO BMS Special Fund – principally refurbishing of the electronics equipment for conference rooms in the C Building, in the context of the asbestos removal project	500 000	650 000
Agency's share of new conference facility (Building M)	500 000	500 000
G. International Public Sector Accounting Standards (IPSAS) (Major Programme 5)		
Implementation of IPSAS	314 000	314 000
H. Technical Cooperation Activities (Major Programme 6)		
Final module of the PCMF application	124 000	124 000
In-Touch Platform for TC programme stakeholders	188 000	188 000
TOTAL	**4 011 000**	**5 420 000**

123. As foreseen in GOV/2006/21 (*Planning for the 2008–2009 and 2010–2011 Programme and Budget Proposals*) the Agency must undertake large infrastructure projects and purchase expensive new equipment and services in the next biennium. These are not of an operational or recurrent nature, and, thus, are shown separately from the operational and recurrent portion of the regular budget previously described in this document. However, they are of high priority, and are indispensable for the Agency to deliver the full range of activities under the regular budget and the TC programme. In addition to the resources listed in Table 11, the essential investments will also be funded by €2.5 million in 2008 and €3.0 million in 2009 from the operational and recurrent portion of the regular budget. Details can be found under each Major Programme in I.2 Highlights of Major Programmes and Corresponding Resources.

124. Adoption of IPSAS by the Agency will require an accrual approach to accounting and budgeting. Under accrual accounting, transactions and other events are recognized when they occur, and not only when cash or its equivalent is received or paid. Accrual budgeting will necessitate a separate presentation of major, one-off or replacement items of a capital nature, which will require depreciation over a number of years depending on their useful economic life. This approach will better support results-based management and enable management and Member States to make more informed resource allocation decisions based on more accurate costing. The Agency's presentation of essential investments is a transitional step towards capital-budgeting. Historically, the occasional need of the Agency to invest in major capital items, such as equipment — without a fund that is built up through depreciation, savings, or additional contributions — has either had a distorting effect on the operational level of the budget or led to under-investment in essential items.

A. Essential Investments for the Agency's Laboratories

125. Ageing equipment in the laboratories at Seibersdorf and Monaco, and in the Isotope Hydrology Laboratory, needs to be replaced, and additional equipment needs to be installed to maintain the necessary anticipated levels of programme support to the scientific and technical major programmes, as well as to the TC programme. Priority is given to replacing essential equipment, which has reached the end of its useful life.

Major Programme 1

Chemistry/Instrumentation Laboratory (€50 000 in 2008 and €50 000 in 2009)

126. An amount of €50 000 is needed in 2008 for replacement of a milling system, an oven, and a homogenizer system. In 2009, €50 000 is needed towards the replacement of an inductively coupled plasma-optical emission spectrometer which has been in use since 1993. This equipment is used in the Chemistry/Instrumentation Laboratory to support the Agency's provision of sample measurements, preparation of reference material for proficiency testing, and training of fellows under the TC programme.

Major Programme 2 ***(€810 000 in 2008 and €190 000 in 2009)***

Dosimetry Laboratory at Seibersdorf (€170 000 in 2008)

127. An amount of €170 000 is needed in 2008 towards the replacement of an old orthovoltage X ray unit and the calibration system for low dose rate (LDR) brachytherapy used in the Dosimetry Laboratory at Seibersdorf. These equipment items are needed to support calibrations of dosimetry equipment from Secondary Standards Dosimetry Laboratories in external beam radiotherapy, radiation protection and LDR brachytherapy. In the event the equipment cannot be replaced, the relevant

calibration services to Member States will not be delivered and training of fellows under the TC programme at the Dosimetry Laboratory will not be possible.

Isotope Hydrology Laboratory (€45 000 in 2008)

128. An amount of €45 000 is needed in 2008 towards the replacement of a 20-year old low level liquid scintillation analyser in the Isotope Hydrology Laboratory. Failure to replace this instrument will limit the production of data for isotope hydrology studies in the *Water Resources* programme.

Marine Environmental Studies Laboratory (€400 000 in 2008)

129. An amount of €400 000 is needed in 2008 for replacement of a mass spectrometer used by the Marine Environmental Studies Laboratory to measure marine radioactivity and non-radioactive pollutants. Such equipment provides analyses of radionuclides in marine samples and is critical for studying natural variations of isotopes and elements. The derived data are needed for marine pollution monitoring studies and for reference material production. It is particularly relevant to the support of TC projects which evaluate pollution flows from land to the sea. It will no longer be possible to guarantee the servicing of the current instrument as it is about to be declared as obsolete by the manufacturer. The modern equipment will allow the provision of better and more accurate services to Member States.

FAO/IAEA Agriculture and Biotechnology Laboratory (€195 000 in 2008)

130. An amount of €195 000 is needed in 2008 to replace equipment used at the FAO/IAEA Agriculture and Biotechnology Laboratory, as follows:

- €130 000 for replacement of a 12 year old gas chromatography mass selection detector which analyses pesticide and veterinary drug residues in food and the environment. The current equipment does not meet the required sensitivities for the purpose of regulations and guidelines. No spare parts are available since production of this specific machine ceased in 2002.
- €40 000 for replacement of obsolete real-time polymerase chain reaction (PCR) equipment used in animal disease diagnosis and for training in the technology.
- €25 000 for replacement of four 15 year old laminar flow hood benches, which are needed for the initiation of in vitro cultures for crop production systems.

SIT Seibersdorf Laboratory (€190 000 in 2009)

131. An amount of €190 000 is needed in 2009 towards the replacement of a gamma cell used in insect sterilization at the SIT Seibersdorf Laboratory. The existing cell can still be used for mutation induction studies, but has already gone through three half-lives and will become unsuitable, i.e. will not be powerful enough, for insect sterilization. The gamma cell will need to be replaced with an X ray machine, as suitable gamma cells are no longer manufactured.

B. Essential Investments for the Incident and Emergency Centre (Major Programme 3)

Incident and Emergency Preparedness and Response (€120 000 in 2008 and €20 000 in 2009)

132. The *Incident and Emergency Preparedness and Response* programme is part of the Agency's response to an increasing number of requests from Member States to assist in minimizing the impact of nuclear incidents and emergencies. In view of the Agency's obligations under the Assistance Convention, it is of utmost importance that the IEC broaden its scope to respond to all types of events

and to ensure that the Secretariat is prepared to respond appropriately and efficiently in any situation that may have actual or potential radiological consequences to health, property or the environment.

133. An amount of €120 000 is required in 2008 and €20 000 in 2009 as an essential investment for part of the implementation of a unified system for emergency notification of incidents and emergencies, as well as essential maintenance and improvement of existing emergency notification and reporting systems (ENAC and NEWS), and the enhancement of the automated callout system. The remaining amount of €150 000 in 2008 and €150 000 in 2009 that is needed for these items will be financed from the operational and recurrent regular budget.

134. The new global reporting system for emergency notifications will provide a unified focal point of communications during incidents and emergencies. It responds to GC(48)/RES/10 and will follow the recommendations of the working groups established under the International Action Plan for Strengthening the International Preparedness and Response System. The recommendations of the working groups will be reviewed and endorsed by the national competent authorities and subsequently considered for approval by the Board of Governors. It should be noted that there is currently no single system for communication of events. This investment will strengthen the Agency's capability to provide assistance and advice within the framework of the Assistance Convention. The automated callout system will improve the capability to fully and rapidly activate the IEC, reducing the response time by one to two hours. It is important that the IEC be able to quickly and easily determine whether radiation levels have increased in a given area due to an accident or incident.

C. Essential Investments for the Agency's Radiation Protection and Monitoring Services (Major Programme 3)

Radiation Protection and Monitoring Services (€90 000 in 2008 and €90 000 in 2009)

135. The ability to provide radiation protection and monitoring services for Agency operations depends on the accuracy and reliability of the equipment and systems of three laboratories: the External Dosimetry Laboratory, the Whole Body Counter Laboratory and the Urine Analysis Laboratory. This essential investment will support the activities of Major Programmes 1, 2, 3, 4 and 6 providing essential and mandatory radiation protection and monitoring services to Agency staff members occupationally exposed to ionizing radiation. It will also allow the Agency to: (a) sustain its international accreditation gained in 2006 that recognizes its performance quality; and (b) use the quality management of the three laboratories as a model for its Member States in their endeavours to comply with international safety standards.

136. The External Dosimetry Laboratory will need an investment of €65 000 in 2008. An active personal dosimeter system will allow the Laboratory to introduce real-time neutron monitoring and web based access from the field. These measurements are essential to ensure the assessment of occupational exposure of Agency staff. In addition, a server needs to be replaced in order to maintain backups and archives of all staff dose information.

137. The Whole Body Counter Laboratory will require investments of €25 000 in 2008 and €15 000 in 2009. A new ultrasound system in this Laboratory will make it possible to measure the real chest wall thickness of workers, a facility that is currently not available. Also, a proportional detector system is needed in order to measure low energy beta radiation in skull, bones and lungs.

138. The Urine Analysis Laboratory will need investments of €75 000 in 2009 for equipment, including replacement of a 13 year old germanium detector, and a special oven for faecal sample treatment. Without these investments, the sample treatment may be limited, with a higher risk of overlooking occupational radiation exposure.

D. Essential Investments for Safeguards Activities (Major Programme 4)

Equipment required for newly safeguarded facilities (€1.3 million in 2008 and €2.544 million in 2009)

139. Effective and efficient implementation of safeguards requires special verification equipment and instrumentation. As new facilities have come under safeguards, demands on the financial resources of Major Programme 4 have increased.

140. The new facilities expected to come under safeguards in the 2008–2009 biennium, which will require significant resources include: (i) a large scale plant to produce mixed uranium and plutonium oxide fuel for light water reactors being built by Japan Nuclear Fuel Ltd in Rokkasho Mura, Japan; and (ii) facilities in Iran.

141. Essential investments of €1.3 million in 2008 and €2.544 million in 2009, primarily for non-destructive assay (NDA), and containment and surveillance equipment, will be needed. Should these funds not be made available on a timely basis, the implementation of the projects mentioned above would be jeopardized.

E. Essential Investments for an Agency Computer Centre (Major Programme 4)

Construction of a secure Computer Centre (€750 000 in 2009)

142. In 2007 the Agency is beginning the construction of a highly secure and reliable technical area to serve as the Agency's Computer Centre. This Centre will replace the multiple provisional spaces that have been in use for over a decade. The funding requested covers only the construction of the Centre's physical infrastructure and its security. It does not include any new or replacement IT equipment. This essential investment, therefore, will support the IT infrastructure for the entire Agency while meeting the security standards required for confidential safeguards information. The Computer Centre will comply with the international standard on information technology, security techniques and information security management.

143. The total cost of the Computer Centre is estimated at €2.8 million. €750 000 is required as an essential investment in 2009. In addition, extrabudgetary funds of €700 000 will be sought.

F. Essential Investments for Infrastructure Facilities at the Vienna International Centre (Major Programme 5)

UNIDO Building Management Services (BMS) Special Fund, principally to refurbish the electronics equipment in the context of the asbestos removal project (€500 000 in 2008 and €650 000 in 2009)

144. The facilities at the VIC are ageing and require maintenance, renovation and adaptation work to meet new requirements and up to date standards for health, safety and security. There has been no major capital injection for the upgrading and improvement of the facilities in the last 25 years. This has had significant implications in terms of higher maintenance and running costs, especially since the Agency's regular budget in this area has not increased for many years.

145. The asbestos removal project, implemented by the Austrian authorities, is providing a unique opportunity to undertake some necessary renovations and improvements at a relatively low cost compared with what the costs would have been if the work was implemented in isolation. The

renovations include replacement of cabling, lighting and floor coverings and enhancement of air-conditioning systems. The essential investments are crucial at this juncture to meet these costs.

146. The maintenance and refurbishment of the VIC is carried out, on behalf of all VIC based organizations (VBOs), by the office of Building Management Services (BMS) of UNIDO. All associated costs, regardless of the direct beneficiary of the work, are shared by the VBOs according to a formula. One of the major activities to be undertaken during the 2008–2009 biennium is the replacement of electronics equipment in the conference rooms of the C Building since much of the equipment, including the interpretation headsets, is obsolete. Although the Agency will be the main user of a new conference facility (Building M), it will still need to contribute its share of the refurbishing costs of the building as for any common area in the VIC. UNIDO's BMS has made a preliminary estimate of €12 million. This estimate is still provisional, and will be subject to a very detailed analysis and review by the Secretariat and the VIC Committee on Common Services. Every effort is being made to reduce this estimate and updated information will be provided, as necessary. An amount of €500 000 has been budgeted in 2008 and €650 000 in 2009 as an essential investment.

Agency's share of new conference facility — Building M (€500 000 in 2008 and €500 000 in 2009)

147. Construction work on the new conference facility, Building M, to be provided by the Government of Austria to the VBOs, began during the last quarter of 2006. This facility is planned to be used initially as swing space during asbestos removal in the current conference facilities in Building C. Upon completion of the asbestos work, the Agency will use the conference space in the new building and the other VBOs will expand their meeting rooms into the Agency's current area in Building C. In this manner, the Agency and the other VBOs will all gain increased meeting room space, which is critical since the current conference facilities are often insufficient to meet demand.

148. The total cost of the new conference facility is estimated to be €52.5 million. In the negotiations with the VBOs leading to the Memorandum of Understanding signed by the four Executive Heads and the Foreign Ministry of Austria in October 2004, the Austrian Government insisted on some level of financial participation by the four VBOs. Following lengthy discussions, the figure was reduced to a total of €2.5 million for all VBOs. This represents less than 5% of the total cost. The Agency, the main beneficiary of the conference facilities, is required to contribute €2 million, which has been budgeted in four equal annual instalments beginning in 2008.

G. Essential Investments for International Public Sector Accounting Standards (IPSAS) (Major Programme 5)

Establishment of a project for implementation of IPSAS (€314 000 in 2008 and €314 000 in 2009)

149. The Board of Governors has approved the adoption of IPSAS (GOV/COM.9/OR.268) as proposed in document GOV/2007/10 "*Proposal to adopt International Public Sector Accounting Standards (IPSAS) by the Agency*". The Chief of Executives Board (CEB) has agreed that IPSAS are to become the accounting standards used by all UN organizations as of January 2010. The introduction and implementation of new accounting standards, and related policies, procedures and reporting will require resources, especially human resources with technical expertise in the development, testing and roll-out of organizational policies and procedures, and the training of staff. While existing capacity and expertise will be fully mobilized, a dedicated project management team needs to be established to coordinate the progress of the project, and technical expertise and operational capacity will need to be augmented during the transition to implement new requirements.

150. The estimated cost for additional staff, consultants, training, travel and contributions for the inter-agency support mechanism, and temporary assistance during the transition and post-implementation support period (2007–2011), is estimated at about €1.9 million[6]. For 2008–2009, €314 000 is required per year, as an essential investment; €200 000 per year for cost-free experts will be funded from extrabudgetary contributions for this project. These amounts do not include the resources related to system support needed for the introduction of IPSAS, which remain unfunded.

H. Essential Investments for Technical Cooperation Activities (Major Programme 6)

151. Major Programme 6 is working to bring about a paradigm shift in the TC programme. It is changing the role of the Agency from that of assistance provider to that of capacity building in recipient States, and also a facilitator of the use of those capacities both to meet development goals and to provide services to other Member States.

Programme Cycle Management Framework (PCMF) (€124 000 in 2008 and €124 000 in 2009)

152. The PCMF system has been developed to permit interactive participation of all stakeholders in the TC programme. It permits registered users to cooperate through an online platform in the design, appraisal and implementation of TC projects, thus facilitating project management and communication among all parties. It has resulted in increased transparency and improved project design quality, as well as greatly reducing the need for paper documents and duplicate inputs.

153. An amount of €124 000 is needed in 2008 and €124 000 in 2009 to complete the establishment of a consolidated IT system that would include the final module of the PCMF application. In addition, an amount of €50 000 in 2008 and €50 000 in 2009 will be used from the operational and recurrent portion of the regular budget. The system will cover project monitoring, closure, assessment and reporting, and improve the capabilities of the PCMF application for the management of regional projects. The consolidated system will fully integrate the PCMF with the other Agency-wide and TC programme applications. Furthermore, it will incorporate an application for the development and updating of CPFs into the system.

154. This investment is required to enable the Secretariat to better manage the entire TC programme management cycle and to be able to report to Member States, not only on project performance but also on the impact of the TC programme, as frequently requested. Without this investment, completion of the system will be delayed and capturing key project information systematically for Member States will remain cumbersome.

In-Touch Platform (€188 000 in 2008 and €188 000 in 2009)

155. An amount of €188 000 is needed in 2008 and €188 000 in 2009 for implementation of an In-Touch Platform for TC programme stakeholders. The objectives of this platform will be to establish, maintain and intensify contacts between the Agency and potential, current and former stakeholders in the TC programme, as well as among themselves. It will facilitate their active participation in all

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[6] The resource requirements for IPSAS in the UN system vary widely: $23 million estimated by the United Nations (A/60/846/Add.3, Annex II); $3.7 million by the World Food Programme (WFP/EB.A/2006/6-1/1); $607 000 by ILO (GB.297/FPA/6); and $1.5–$2.5 million by UNESCO (175EX/INF.7). These estimates do not include the amounts related to changing information systems. There are many variables that influence the resource requirements in each organization: capacity, operational complexities, extent of field office presence, degree of preparedness in financial policies and in information systems such as commercial systems, etc.

aspects of the TC programme and other Agency activities, as well as collaborative efforts among them at the bilateral, regional and global levels. The main users of this platform will be current and potential experts and trainees, national institutes, TC counterparts, national liaison officers and Secretariat staff.

156. The components of this platform will include an institution roster which captures and disseminates information about Member State institutions in nuclear related fields, and an expert roster that will promote and facilitate the use of Member State experts in the TC programme and other Agency activities, as well as promoting South–South cooperation. The In-Touch Platform is required to respond to Member State requests contained in General Conference resolutions (GC(50)/RES/12) to make greater use of their institutional capacities, to facilitate the sharing of information on resource institutions between and within Member States and to strengthen TCDC. Without this investment, expansion of services provided to Member States, particularly related to new initiatives such as mapping of national capacities, will be delayed or not further developed.

I.4 Draft Resolutions for 2008

157. This section presents the Agency's draft resolutions for 2008, including the appropriations for the 2008 regular budget, the allocation for the Technical Cooperation Fund (TCF) in 2008, and the Working Capital Fund (WCF) in 2008.

A. The regular budget

158. The regular budget appropriations for 2008 are presented in two parts: one for the operational and recurrent portion of the regular budget (paragraphs 1 and 2 of Resolution A); and one for the essential investments portion (paragraphs 3 and 4 of Resolution A). The expenditures against these appropriations will be recorded separately, so that funds appropriated for the essential investments will not be used for the operational and recurrent portion of the regular budget.

159. The operational and recurrent portion of the regular budget for 2008 (€291 320 187) remains at the same level as 2007 in real terms. Essential investments for 2008 (€4 011 000) are allocated to the relevant major programmes.

160. The resolution for the regular budget appropriation contains an adjustment formula to take into account the exchange rate variations during the year. Member State contributions will be based on the scale of assessment fixed by the General Conference in September 2007.

B. Technical cooperation programme

161. The TC activities of the Agency are financed from the TCF and extrabudgetary contributions. The TCF is mainly comprised of voluntary contributions, for which a target is recommended each year by the Board of Governors, and National Participation Costs paid by recipient Member States. The target figure for voluntary contributions to the TCF recommended by the Board of Governors for 2008 noted in General Conference resolution GC(50)/RES/7 amounts to $80 000 000; the corresponding indicative planning figure for 2009, as noted in the resolution, shall be approximately, but not less than, $82 000 000.

162. The forecast of the resources for the TC programme for 2008 amounts to $101 000 000 and comprises: (a) $74 000 000 for estimated core project funding; (b) $14 000 000 for the estimated implementation levels of extrabudgetary activities; (c) $600 000 under UNDP projects; and (d) $12 400 000 for government cost sharing contributions[7]. This amount does not constitute a target for or limitation on funds and does not in any way prejudge the TC programme for 2008. It is too early to make a firm forecast of what the resources for the TC programme for 2009 might be but a tentative estimate would be $103 000 000.

C. Working Capital Fund

163. The 50th General Conference approved a continuation of the WCF at the €15 210 000 level for 2007. No change in this level is proposed for 2008, although it should be borne in mind that the average monthly requirement according to the budget for Agency programmes with price adjustment would be €24.1 million.

[7] Funds provided by Member States to augment projects in their own country.

Draft Resolutions

A. REGULAR BUDGET APPROPRIATIONS FOR 2008

The General Conference,

Accepting the recommendations of the Board of Governors relating to the regular budget of the Agency for 2008[1/],

1. Appropriates on the basis of an exchange rate of $1.00 to €1.00,[2/] an amount of €291 320 187 for the operational and recurrent portion[3/] of regular budget expenses of the Agency in 2008 as follows[4/]:

		€
1.	Nuclear Power, Fuel Cycle and Nuclear Science	28 436 786
2.	Nuclear Techniques for Development and Environmental Protection	32 493 885
3.	Nuclear Safety and Security	23 515 728
4.	Nuclear Verification	113 672 507
5.	Policy, Management and Administration	74 469 275
6.	Management of Technical Cooperation for Development	16 241 201
	Subtotal Agency Programmes	288 829 382
7.	Reimbursable Work for Others	2 490 805
	TOTAL	291 320 187

the amounts in the appropriation sections to be adjusted in accordance with the adjustment formula presented in Attachment A.1 in order to take into account the exchange rate variations during the year.

[1/] See document GC(51)/2.

[2/] Refer to paragraph 33 of the Overview of GC(51)/2.

[3/] See Part I, Chapters I.1 and I.2 of GC(51)/2.

[4/] Appropriation Sections 1–6 represent the Agency's major programmes.

2. Decides that the foregoing appropriation shall be financed, after the deduction of
   - Revenues deriving from Reimbursable Work for Others (Section 7); and
   - Other Miscellaneous Income of €4 482 000 (representing €3 363 600 plus $1 118 400);

from contributions by Member States amounting, for an exchange rate of $1.00 to €1.00, to €284 347 382 (€228 711 116 plus $55 636 266), in accordance with the scale of assessment fixed by the General Conference in resolution GC(51)/RES/ ;

3. Appropriates on the basis of an exchange rate of $1.00 to €1.00, an amount of €4 011 000 for the essential investments portion[5/] of the regular budget of the Agency in 2008 as follows[6/]:

		€
1.	Nuclear Power, Fuel Cycle and Nuclear Science	50 000
2.	Nuclear Techniques for Development and Environmental Protection	810 000
3.	Nuclear Safety and Security	210 000
4.	Nuclear Verification	1 315 000
5.	Policy, Management and Administration	1 314 000
6.	Management of Technical Cooperation for Development	312 000
	TOTAL	4 011 000

the amounts in the appropriation sections to be adjusted in accordance with the adjustment formula presented in Attachment A.2 in order to take into account the exchange rate variations during the year.

4. Decides that the foregoing appropriation shall be financed from contributions by Member States amounting, for an exchange rate of $1.00 to €1.00, to €4 011 000 (€2 872 772 plus $1 138 228), in accordance with the scale of assessment fixed by the General Conference in resolution GC(51)/RES/ ; and

5. Authorizes the Director General:
   (a) To incur expenditures additional to those for which provision is made in the regular budget for 2008, provided that the relevant emoluments of any staff involved and all other costs are entirely financed from revenues arising out of sales, work performed for Member States or international organizations, research grants, special contributions or other sources extraneous to the regular budget for 2008; and
   (b) With the approval of the Board of Governors, to make transfers between any of the Sections listed in paragraphs 1 and 3 above.

[5/] See Part I, Chapter I.3 of GC(51)/2.

[6/] Appropriation Sections 1–6 represent the Agency's major programmes.

ATTACHMENT

A.1 APPROPRIATIONS FOR THE OPERATIONAL AND RECURRENT PORTION OF THE REGULAR BUDGET IN 2008

ADJUSTMENT FORMULA IN EURO

		€			US$	
1.	Nuclear Power, Fuel Cycle and Nuclear Science	22 321 960	+	(	6 114 826	/R)
2.	Nuclear Techniques for Development and Environmental Protection	25 902 026	+	(	6 591 859	/R)
3.	Nuclear Safety and Security	18 145 694	+	(	5 370 034	/R)
4.	Nuclear Verification	88 818 792	+	(	24 853 715	/R)
5.	Policy, Management and Administration	63 656 775	+	(	10 812 500	/R)
6.	Management of Technical Cooperation for Development	13 229 469	+	(	3 011 732	/R)
	Subtotal Agency Programmes	232 074 716	+	(	56 754 666	/R)
7.	Reimbursable Work for Others	1 918 117	+	(	572 688	/R)
	TOTAL	233 992 833	+	(	57 327 354	/R)

Note: R is the average United Nations dollar-to-euro exchange rate which will be experienced during 2008.

ATTACHMENT

A.2. APPROPRIATIONS FOR THE ESSENTIAL INVESTMENTS PORTION OF THE REGULAR BUDGET IN 2008

ADJUSTMENT FORMULA IN EURO

		€			US$	
1.	Nuclear Power, Fuel Cycle and Nuclear Science	33 050	+	(	16 950	/R)
2.	Nuclear Techniques for Development and Environmental Protection	535 410	+	(	274 590	/R)
3.	Nuclear Safety and Security	138 810	+	(	71 190	/R)
4.	Nuclear Verification	869 215	+	(	445 785	/R)
5.	Policy, Management and Administration	1 125 623	+	(	188 377	/R)
6.	Management of Technical Cooperation for Development	170 664	+	(	141 336	/R)
	TOTAL	2 872 772	+	(	1 138 228	/R)

Note: R is the average United Nations dollar-to-euro exchange rate which will be experienced during 2008.

B. TECHNICAL COOPERATION FUND ALLOCATION FOR 2008

The General Conference,

Accepting the recommendation of the Board of Governors, which was noted by the General Conference in GC(50)/RES/7, that the target for voluntary contributions to the Agency's Technical Cooperation Fund for 2008 shall be $80 000 000,

1. Decides that for 2008 the target for voluntary contributions to the Technical Cooperation Fund shall be $80 000 000,

2. Notes that funds from other sources, estimated at $1 000 000, are expected to be available for that programme,

3. Allocates the amount of $81 000 000 for the Agency's Technical Cooperation programme for 2008, and

4. Urges all Member States to make voluntary contributions for 2008 in accordance with Article XIV.F of the Statute, with paragraph 2 of its Resolution GC(V)/RES/100 as amended by Resolution GC(XV)/RES/286 or with paragraph 3 of the former Resolution, as appropriate.

C. THE WORKING CAPITAL FUND IN 2008

The General Conference,

Accepting the recommendations of the Board of Governors relating to the Agency's Working Capital Fund in 2008,

1. Approves a level of €15 210 000 for the Agency's Working Capital Fund in 2008;

2. Decides that the Fund shall be financed, administered and used in 2008 in accordance with the relevant provisions of the Agency's Financial Regulations[7/].

3. Authorizes the Director General to make advances from the Fund not exceeding €500 000 at any time to finance temporarily projects or activities which have been approved by the Board of Governors for which no funds have been provided under the regular budget, and

4. Requests the Director General to submit to the Board statements of advances made from the Fund under the authority given in paragraph 3 above.

[7/] INFCIRC/8/Rev.2.

PART II

Details of the Programme and Budget for 2008–2009 by Major Programme

Major Programme 1
Nuclear Power, Fuel Cycle and Nuclear Science

Introduction

The principal driving forces for Major Programme 1 in 2008–2009 are:

- The continuing rise in expectations around the world for nuclear power, as expressed in many statements at the 49th and 50th General Conferences, at the March 2005 Paris conference on Nuclear Power for the 21st Century, at other international forums, and in national energy strategies;
- The global long term trend in nuclear power development towards increased sustainability through more efficient use of resources and strengthened non-proliferation;
- Increasing interest in regional and multilateral approaches in the areas of nuclear power and the fuel cycle.

Through this major programme, the Agency provides services and advice to Member States on nuclear power and the nuclear fuel cycle for:

- Continued reliable and safe lifetime operation of present reactor systems and fuel cycle facilities;
- Expanded use of nuclear power, particularly for countries currently without nuclear power or with only small nuclear power programmes;
- Development of advanced reactor systems and their fuel cycles for the long term;
- Capacity building for energy analysis and planning;
- Objective consideration of the role of nuclear power for sustainable development;
- Development of nuclear knowledge management, information and communication.

With respect to 'continued reliable and safe lifetime operation of present reactor systems and fuel cycle facilities', this major programme gives increased emphasis on ageing nuclear facilities, uranium and thorium resources and research reactors. The ageing of nuclear facilities and its workforce requires increased activities in the area of plant life management and decommissioning, and on ensuring that lessons learned are efficiently and broadly applied to management improvements. Increased Agency support of new exploration, mining and milling responds to growing interest, also among Member States not currently involved in nuclear activities, in uranium and thorium resources following a long period of stagnation in uranium exploration. Concerning research reactors, Agency activities provide support to Member States in their work to reduce the use of high enriched uranium (HEU) in research reactors and in other experimental facilities.

In the case of the 'expanded use of nuclear power, particularly for countries currently without nuclear power or with only small nuclear power programmes', the major programme assists interested Member States — developed and developing, technology holders and users — in converting an overall global vision of the role of nuclear energy, and innovative nuclear systems (INSs), for sustainability into national technological and policy scenarios. It develops infrastructure milestones that cover not just human resources and necessary industrial support, but also the development of legal and regulatory frameworks. The programme also addresses the increased interest in regional and multilateral cooperation, particularly with respect to energy planning, energy security, infrastructure development, research reactors, fuel cycle facilities and waste management, as well as interest in possible supply assurance mechanisms.

With regard to the 'development of advanced reactor systems and their fuel cycles for the long term', the expansion of nuclear power includes the development of advanced reactors and fuel cycles with improved safety, security, non-proliferation and economic characteristics that also utilize resources more efficiently, e.g. through a closed fuel cycle with recycling of spent fuel. The major programme catalyses innovation and the underlying basic science to better assess alternative advanced systems and to increase the predictability, reliability and efficiency of research. An important new stage in the development of fusion energy — the scientific and engineering demonstration of fusion technology — was marked by the agreement on the construction of the International Thermonuclear Experimental Reactor (ITER) in Cadarache, France. The Agency's activities will foster the involvement of Member States in fusion research and facilitate links with the ITER partners. Closer linkages between fusion and fission technology development may create additional synergies benefiting nuclear power.

The objective of ‘capacity building for energy analysis and planning’ is to provide energy analysis tools tailored to the special circumstances of different developing countries, and to respond to the increasing demand for such analysis due to growing energy needs and rising expectations for nuclear power.

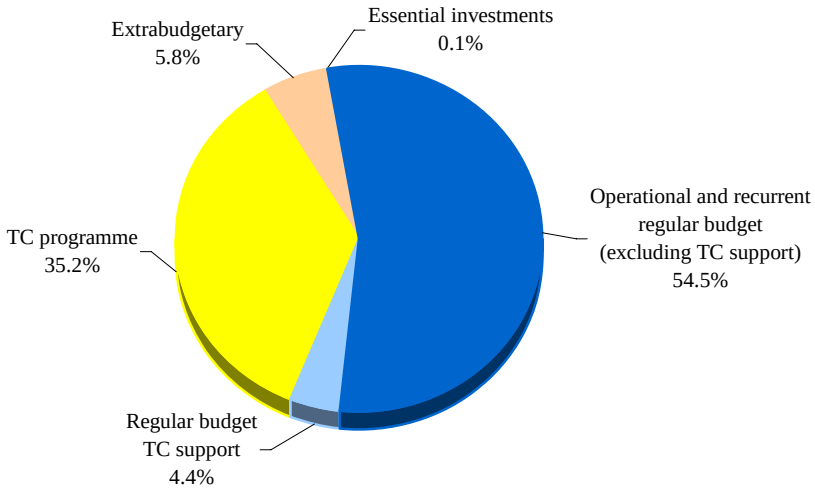
In the case of the ‘objective consideration of the role of nuclear power for sustainable development’, the major programme includes activities for encouraging the fair consideration of nuclear power in international environmental and development agreements, including post–2012 greenhouse gas (GHG) emission reduction schemes.

With respect to the ‘development of nuclear knowledge management, information and communication’, the major programme addresses the growing need to facilitate the safe expansion of nuclear power through the continuous and effective transfer of nuclear knowledge and information. This involves: linking centres of competence with centres of growth; supporting the process of ‘learning by doing’; taking full advantage of Agency information resources such as the International Nuclear Information System (INIS), registries, databases and training packages; and establishing new forms of cooperation among nuclear libraries.

Objective	Performance Indicators
— To enhance the contribution of nuclear science and nuclear power to sustainable development by achieving more effective use of current nuclear technologies, advancing nuclear science and technology, catalysing innovation, and sustaining and building up the experience, expertise, knowledge base and capacity needed to support existing and expanded use of nuclear power and nuclear science applications.	— Number of Member States using the Agency’s resources, guidance, recommendations, analytical tools, analyses and assistance, and the level of use. — Number of joint initiatives, joint products and other interactions with national and international organizations. — Consideration of the nuclear option in international forums.

Outcomes	Performance Indicators
— Increased use of the Agency’s knowledge resources, guidance and recommendations in nuclear science, managing nuclear facilities and programmes, addressing urgent issues throughout the fuel cycle and promoting the development of evolutionary and innovative designs and their applications.	— Number of Member States using the Agency’s resources, guidance, recommendations, analytical tools, analyses and assistance, and the level of use.
— Increased use of the Agency’s knowledge resources, analytical tools, analyses and assistance in energy system assessment, particularly in developing country Member States and economies in transition, and in international deliberations and analyses about sustainable development.	— Number of Member States using the Agency’s resources, guidance, recommendations, analytical tools, analyses and assistance, and the level of use.
— Increased international cooperation and national competence in nuclear science and better use of resources and facilities.	— Number of joint initiatives, joint products and other interactions with national and international organizations.
— Nuclear power option remains open for all interested Member States.	— Consideration of the nuclear power option in international forums.

2008–2009 Resources for Nuclear Power, Fuel Cycle and Nuclear Science[1]



Programmes	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Overall management, coordination and common activities	901 233	901 229	1 802 462
Nuclear Power	5 655 513	5 655 517	11 311 030
Nuclear Fuel Cycle and Materials Technologies	2 543 593	2 543 474	5 087 067
Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development	10 278 727	10 279 018	20 557 745
Nuclear Science	9 057 720	9 058 283	18 116 003
Operational and recurrent regular budget	28 436 786	28 437 521	56 874 307
Essential investments	50 000	50 000	100 000
Total regular budget	**28 486 786**	**28 487 521**	**56 974 307**
Extrabudgetary	2 792 853	2 837 853	5 630 706
TC programme	17 153 700	16 866 500	34 020 200
Total resources	**48 433 339**	**48 191 874**	**96 625 213**

[1] Excludes unfunded activities of €1 891 347.

1.0.0.1 Overall management, coordination and common activities

Description	Main outputs
The overall coordination and advisory activities within the major programme relate to, and interact with, all of the programmes and are crucial for achieving efficiency and effectiveness in programme implementation. Their efficient implementation contributes to an increase in programme transparency and outreach. The new activities for 2008–2009 address recent Agency management initiatives such as the Nuclear Power Support Group, the Nuclear Energy Series, the Continuous Improvement Group, and the joint implementation with the Department of Nuclear Safety and Security of subprogrammes on plant life management/long term operation and management systems/management for safety. They additionally recognize the importance of support for public information and communication in response to rising expectations for nuclear power.	Guidance, reports, policy documents, advice and recommendations.

1.0.0.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	901 233	901 229
Extrabudgetary	—	—
Unfunded	—	—

Programme 1.1 Nuclear Power

Rationale: Enlarging the benefits of the peaceful uses of nuclear science and technology is a fundamental mandate for the Agency. This programme provides the core engineering, technological and management support to interested Member States in the field of nuclear power with special emphasis on the needs of developing countries. Three important goals have guided the formulation of priorities:

- The first is to respond to the needs of interested Member States in improving their national nuclear power programmes and infrastructures and evaluate the need for possible replacement technology within the country. Those needs are especially important with regard to the performance and life management and optimization of nuclear power plants, including national decisions on the phase out of nuclear power and/or possible decommissioning. This will be through the provision of a worldwide pool of information and expertise on internationally accepted and proven engineering and management practices in all relevant areas, including technical and human performance improvement, change management, implementation of management systems and a total quality management approach to nuclear power plant operations.
- The second is to act as a catalyst for innovation and to assist, as appropriate, in the resolution of scientific and technological issues in the area of nuclear power, including electricity generation and application for other uses such as desalination and hydrogen production. The Agency will coordinate research, promote information exchange and analyse technical data and results for various reactor lines (such as advanced water cooled reactors, high temperature gas cooled reactors, liquid metal cooled reactors and accelerator driven systems), and for innovative nuclear energy systems (INSs), including small and medium sized reactors (SMRs). The focus will be on supporting the establishment of nuclear power as a sustainable energy source for various applications, especially considering competitive economics, achieving very high levels of safety and proliferation resistance, effective use of resources and minimization of waste. The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) will provide a forum for the coordination of programmes in Member States on INS development and for system analysis of the future role of nuclear energy on a regional and global basis.
- Finally, it is important to manage, preserve and further enhance nuclear expertise, knowledge and competence in support of Member States, and sustain the Agency's unique position as the leading global international organization in the nuclear field. The Agency will continue to provide and update databases and knowledge supporting the optimization of performance, service life and infrastructure of

nuclear power plants, and supporting advanced reactor technology development and applications in Member States. This approach will allow for the expansion of partnerships and exchange of information to facilitate the beneficial use of nuclear energy, including non-electrical applications.

Objectives:

— To enhance the capability of interested Member States, in a rapidly changing market environment, to improve nuclear power plant operating performance, life cycle management including decommissioning, human performance, quality assurance and technical infrastructure, through good practices and innovative approaches consistent with global objectives on non-proliferation, nuclear safety and security.

— To enhance the capacity of Member States for the development of evolutionary and innovative nuclear system technology for electricity generation, actinide utilization and transmutation and for non-electric applications, consistent with sustainability goals.

— To facilitate the improvement of public understanding of nuclear power.

Outcomes	Performance Indicators
— Use of the Agency's databases and recommendations in engineering, technology development and management practices in Member States.	— Number of Member States using the Agency's recommendations in engineering, technology development and management practices, evaluation methodology, guidance, databases and training methodologies.
— Increased cooperation between Member States for evolutionary and innovative nuclear reactor technology development and applications.	— Number of Member States cooperating in evolutionary and innovative nuclear reactor technology development and applications under Agency coordination.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: The lessons learned, as reported in programme performance reports, evaluations and reviews, include the need to:

- Continue the dissemination of best practices through the publication of relevant technical documents;
- Improve the timeliness and quality of Power Reactor Information System (PRIS) data;
- Develop documents including a guidebook on milestones in infrastructure building, to help interested Member States better understand appropriate processes and paths for infrastructure development in line with their long term energy goals;
- Increase Agency capabilities to respond to requests from Member States interested in expanding or starting nuclear power programmes.

In response, activities on infrastructure have been increased and are now covered under a new subprogramme, and joint projects have been created for strengthening the coordination activities of Major Programme 1 and Major Programme 3 relating to both safety and the technical aspects of nuclear power plant operations, with a focus on plant life management/long term operation (PLiM/LTO) and management systems and management for safety.

The major methods employed to increase efficiency include: cross-cutting approaches to planning and implementation of the subprogrammes; matrix management facilitating the efficient use of staff resources and competence and enhanced coordination between the programme and technical cooperation projects.

1.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	5 655 513	5 655 517
Extrabudgetary	1 932 929	2 112 929
Unfunded	231 000	326 000

Specific criteria for prioritization:

1. First priority is given to activities in response to the increasing use of nuclear energy and to emerging development needs, to ensure sharing of the best practices in efficient operation, and to support the launching of nuclear power programmes and the development of nuclear power in the near term.
2. Second priority is given to activities underpinning innovative development of nuclear power for a long term sustainable future.
3. Third priority is given to activities fostering international cooperation, information exchange, knowledge management and education on nuclear power issues.

Subprogramme 1.1.1 Integrated Support for Operating Nuclear Facilities

Rationale: There have been remarkable improvements in the operating performance of many nuclear power plants within the last several years. This subprogramme will identify the relevant factors and approaches influencing these improvements and will assist in sharing experiences among Member States regarding engineering and management support for operation, maintenance, life management, organizational culture, management systems, training, and information exchange.

Many Member States have given high priority to, and have initiated activities on, continuing the operation of nuclear power plants beyond the timeframe originally anticipated (e.g. 30 or 40 years). Out of a total of 442 operating nuclear power plants, 288 have been in operation for more than 20 years (as of June 2006). The need for engineering support in the operation, maintenance, safety review, life management and long term operation is becoming more evident in the implementation and decision making processes of large scale nuclear power plant engineering programmes.

In order to support activities related to the improvement of nuclear power plant safety and performance, there is a need to maintain and update relevant information exchange systems (databases and web pages). A number of such systems have been established at the Agency, either to support programmatic activities directly, or to provide services and products to Member States. Additional improvement in performance can be achieved through the utilization of information gained from the data analysis of operational and outage experience.

To improve nuclear power plant safety, performance and service life in the new competitive environment, publications in the new Nuclear Energy Series and those dealing with safety will be produced to strengthen the decision making capabilities of technical managers. Some documents and publications will be developed in cooperation with the Department of Nuclear Safety and Security.

Objective: To enhance performance and safe lifetime operation of nuclear power plants.	
Outcome	**Performance Indicator**
— Use of the Agency expertise and guidance to establish and implement the best practices in the areas of infrastructure, human performance and nuclear power plant design and operation.	— Number of Member States using the Agency's resources, safety standards, guidance, recommendations and databases.

Programmatic changes and trends: Tasks dealing with PLiM and LTO which were previously under Major Programme 1 and Major Programme 3 have been merged into one project to avoid duplication of work.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 11.8% (€210 721) in 2008 as compared with 2007 and no significant change in 2009 over 2008. Resources were moved to subprogramme 1.1.2 Support for Expansion of Nuclear Power Plants complying with the trend in Member States to begin construction of new nuclear power plants.

1.1.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 613 730	1 618 366
Extrabudgetary	61 580	61 580
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.1.1.1 Engineering support for design, operation, maintenance, and plant life management for safe long term operation ***Duration:*** 2006–2009 ***Priority:*** 1	New and updated safety standards and related technical supporting documents on specific engineering aspects of design, operation, maintenance, and plant life management of operating nuclear power plants; engineering safety/design review services to facilitate transfer of technology and exchange of experience; exchange of information among Member States and sharing their national experience; international conference on Opportunities and Challenges for Water Cooled Reactors in the 21st century; advanced reactor design and optimization for operation and maintenance.
1.1.1.2 Strengthening training and human resources ***Duration:*** 2008–2009 ***Priority:*** 2	Nuclear Energy Series Guidance publications on specific aspects of human performance and training; information and national experience in the subject area exchanged between Member States.
1.1.1.3 Support plant performance improvement by information exchange ***Duration:*** Recurrent ***Priority:*** 2	Updated information exchange systems and databases such as Country Nuclear Power Profiles, e-catalogue of training services, Nuclear Economic Performance Information System, operating experience, and international databases on instrumentation and control (I&C) modernization projects, component reliability; operational/outage information exchanged among Member States and sharing of their national experience.

Subprogramme 1.1.2 Support for Expansion of Nuclear Power Plants

Rationale: After a slowdown in the construction of new nuclear power plants, there has been a marked increase in recent years in the number of Member States with operating nuclear plants that are interested in building new plants. This subprogramme will assist in the sharing of relevant experience among Member States regarding the effective expansion of these nuclear power programmes.

There is now a more competitive energy market than there was when most existing plants were constructed, while at the same time more demanding safety and environmental requirements are being imposed. Together, these pose special challenges to the managers of nuclear power plant operating organizations as they strive to implement cost effective solutions for designing, constructing and operating new plants.

Objective: To enable Member States with existing nuclear power plants to implement the design, construction and operation of new facilities based upon international experience

Outcome	Performance Indicator
— Use of Agency documents, materials and expertise and consideration of international lessons learned in the planning of new nuclear power plants.	— Percentage of Member States expanding their nuclear power plant fleets that request materials or services from the Agency.

Programmatic changes and trends: This is a new subprogramme focusing on new nuclear power plant construction by Member States with existing plants.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 30.8% (€210 334) in 2008 over 2007 and no change in 2009 over 2008, complying with the trend in Member States to begin the construction of new plants. The additional resources were received from Subprogramme 1.1.1, Integrated Support for Operating Nuclear Facilities.

1.1.2	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	917 970	917 970
Extrabudgetary	92 370	92 370
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.1.2.1 Preparations for adding nuclear power plants ***Duration:*** 2008–2009 ***Priority:*** 1	Guidance material in the Nuclear Energy series and publications on lessons learned in planning and preparation of new nuclear power plant projects; information and national experience in the subject area exchanged between Member States through benchmarking activities.
1.1.2.2 Implementation and engineering support for new nuclear power plant projects ***Duration:*** 2008–2009 ***Priority:*** 2	Publications in the Nuclear Energy series on management, implementation and engineering support for new nuclear power plant projects; benchmarks of experience on management, implementation and engineering support for such projects.
1.1.2.3 Utilization of advanced technologies for new nuclear power plant projects ***Duration:*** 2008–2009 ***Priority:*** 2	Publications in the Nuclear Energy series on utilization of advanced technologies in new nuclear power plant projects; guidance to nuclear power plant operating organizations in Member States to effectively use this information.

Subprogramme 1.1.3 Infrastructure and Planning for the Introduction of Nuclear Power Programmes

Rationale: In 2006, the General Conference recognized, in resolution GC(50)/RES/13 Part B2, that the development and implementation of an appropriate infrastructure to support the successful introduction of nuclear power and its safe and efficient use is an issue of central concern, especially for countries that are considering and planning their first nuclear power project. This new subprogramme is established in response to this resolution and will coordinate the Agency's range of activities in this area.

The infrastructure to support the implementation of a nuclear power project consists of a wide range of topics, ranging from the physical facilities and equipment associated with the delivery of the electricity, the transport of the material and supplies to the site, the site itself, and the facilities for handling the radioactive waste material, to the legal and regulatory framework within which all of the necessary activities are carried out, and the human and financial resources necessary to provide confidence in the ability to implement the required activities.

These topics are addressed by different parts of the Agency and the appropriate coordination of the activities of the Agency has been identified as a requirement. To address this issue and to develop a coordinated approach, an inter-Departmental group was established to develop a framework to provide effective and coordinated support to interested Member States. The aim is to identify the key functional activities necessary to enable the Agency to help assess the country's energy demand and identify the legislative and regulatory framework necessary to ensure public health and safety, protection of the environment, and reliable and economic operation of nuclear installations.

Objective: To achieve improved understanding by all Member States of the requirements and obligations that are essential in order to implement nuclear power programmes.	
Outcome	**Performance Indicator**
— Use by Member States considering the introduction of nuclear power plants of the guidance provided by the Agency and improved clarity of the requirements and obligations of any Member State operating, or planning to operate nuclear power plants	— Number of Member States using Agency's support and guidance for the assessment and implementation of nuclear infrastructure and planning the first nuclear power plant

Programmatic changes and trends: In 2006–2007, the activities on infrastructure have been covered by the project on strengthening national and regional nuclear power infrastructures within the subprogramme on improving organizational performance. In 2008–2009, they are included as a subprogramme in response to the General Conference resolution, GC(50)/RES/13 Part B2.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 19.5% (€86 725) in 2008 over 2007 and no significant change in 2009 over 2008. The importance of the activities on infrastructure has been highlighted by General Conference resolutions in 2005 and 2006. Bringing the activities together into this new subprogramme will ensure coordination of the relevant activities. Additional resources are still needed to implement all of the activities requested by the General Conference resolutions.

1.1.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	545 634	540 945
Extrabudgetary	74 324	74 324
Unfunded	133 000	140 000

Projects

Title, duration and priority	Main outputs
1.1.3.1 Infrastructure support for Member States interested in nuclear power ***Duration:*** 2008–2009 ***Priority:*** 1	Publications providing guidance for Member States considering the introduction of nuclear power plants; assistance to these Member States in the development of the appropriate infrastructure, either through review services or technical cooperation projects; organization of the international ministerial conference (partially unfunded).
1.1.3.2 Planning and support for Member States' first nuclear power project ***Duration:*** 2008–2009 ***Priority:*** 1	Publications in the Nuclear Energy series on guidance for Member States that have decided to implement a nuclear power programme; publications providing advice and examples of national proven practices that have achieved successful results; preparation of documentation and material to support the interdepartmental standing committee Nuclear Power Support Group.
1.1.3.3 Development of future nuclear infrastructure arrangements ***Duration:*** 2008–2009 ***Priority:*** 1	Documentation on the assessment of the benefits of nuclear infrastructure development upon national economies; proposals for improvements in international and national infrastructure arrangements.

Subprogramme 1.1.4 Coordination of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)

Rationale: Any major future increase in the use of nuclear power will depend largely on continued innovation in reactor and fuel cycle technology — focused on maximizing the benefits of nuclear power while minimizing the concerns associated with economic competitiveness, resources and waste management, safety, environmental impacts, proliferation resistance and physical protection. By making use of the potential and added value achieved through cooperative efforts for the development of INSs, nuclear energy can contribute to fulfilling

energy needs in the 21st century in a sustainable manner. The Agency is the only international organization that is positioned to provide a global forum for cooperation involving both developing and industrialized Member States.

INPRO was launched in 2000 in response to the need for a programme to address innovation and the development of INSs. Since then, it has found broad support from Member States through resolutions of the General Conferences and the UN General Assembly. It has attracted the increasing interest of Member States, and membership has grown consistently, to 28 members in 2006. Overall guidance and review of the results is provided by the INPRO Steering Committee (comprising senior officials from INPRO Members). INPRO also pursues synergy and cooperation with other international efforts focused on innovative technology development.

INPRO is divided into two phases: Phase 1 was completed in July 2006. It produced reports on the validated methodology for the assessment of INSs in the areas of economics, safety, environment, waste management, proliferation resistance and infrastructure. Phase 2, which started in July 2006, pursued three directions in its activities: (1) further improvement of the INPRO methodology; (2) infrastructure and institutional activities; and (3) collaborative projects among INPRO members. Through these activities, INPRO brings together both technology holders and users.

Objective: To facilitate the development of competitive, safe, environmentally benign and proliferation resistant innovative nuclear energy systems to meet the global energy needs of the 21st century in a sustainable manner by providing an international forum and coordination of activities in this area.	
Outcomes	**Performance Indicators**
— Increased international guidance and coordination for the development and deployment of INSs and their applications.	— Number of INPRO members actively involved in collaborative projects.
— Use by Member States of guidance provided by the Agency on technology development for INSs and on infrastructure development framework to support the deployment of INSs worldwide.	— Number of jointly implemented collaborative projects.

Programmatic changes and trends: A greater emphasis is being placed on collaborative projects during Phase 2 of INPRO.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 17.3% (€54 853) in 2008 compared with 2007 and no change in 2009 as compared with 2008, due to the transfer of a post from subprogramme 1.3.4 International Nuclear Information System (INIS) because of the high priority of INPRO. All activities of this subprogramme are subject to INPRO Steering Committee guidance on Phase II and the availability of extrabudgetary funds.

1.1.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	383 328	383 328
Extrabudgetary	1 248 669	1 434 669
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.1.4.1 Development of requirements and guidance for INSs ***Duration:*** Recurrent ***Priority:*** 2	Publications providing guidance on the assessment of INSs and recommendations on developing and expanding infrastructure to facilitate their deployment.
1.1.4.2 Coordination of international activities for INSs ***Duration:*** Recurrent ***Priority:*** 1	Documented results of collaborative projects by Member States for the development and deployment of INSs.

Subprogramme 1.1.5 Technology Development for Advanced Reactor Lines

Rationale: Continued technological advances are key to the future growth of nuclear power, and to its ability to provide sustainable, economically competitive power while meeting increasingly stringent safety requirements. Advances in competing fossil based technologies and the trend toward deregulated electricity markets mean that nuclear power plants must be built in shorter times at lower capital costs, and they must be highly reliable and economical to operate. Sustainability goals require improvements in nuclear fuel utilization as well as investigations of actinide and long lived fission product transmutation. Continuous feedback from technology development will form an important element for the further improvement of advanced reactor lines. Member States can benefit from the sharing of information and knowledge, performing cooperative assessments, and pooling resources for conducting joint research in advanced reactor technology. Furthermore, all Member States interested in using nuclear energy need balanced and objective information on advances in nuclear power technology.

This subprogramme brings together experts to pool R&D resources from national organizations towards agreed common goals. The global forum is provided through an existing structure of Technical Working Groups (TWGs) on major reactor lines (water cooled reactors, gas cooled reactors and fast reactors). The national representatives on these TWGs exchange information, discuss their activities, and identify areas in which they are interested in collaborating with the Agency. For the agreed activities, the representatives then ensure appropriate support from their national experts. Collaboration is in the form of information exchange and coordinated research.

Objective: To achieve progress in the development of advanced nuclear power technologies that have competitive economics and meet stringent safety objectives through international information exchange and coordinated research.

Outcome	Performance Indicator
— Use by Member States of information provided through the Agency on technology development for advanced reactors.	— Number of Member States using information on technology development provided by the Agency.

Programmatic changes and trends: There has been a noticeable increase in interest in fast reactors and non-electrical applications. Additionally, there have been requests for additional support by Member States in advanced water cooled reactor technology assessment and deployment.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 2.9% (€46 306) in 2008 as compared with 2007 and no significant change in 2009 as compared with 2008, due to increasing Member State interest in this area. The additional work will be undertaken by transferring resources from Subprogramme 1.1.6 Support for Non-electric Applications of Nuclear Power and from efficiency gains through the increased use of electronic means of interaction.

1.1.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 700 213	1 695 001
Extrabudgetary	435 986	429 986
Unfunded	53 000	201 000

Projects

Title, duration and priority	Main outputs
1.1.5.1 Technology advances in water cooled reactors for improvements in economics and safety ***Duration:*** Recurrent ***Priority:*** 1	Publications in the Nuclear Energy series on the role of heavy water reactors (HWRs) on the utilization of fissionable resources; simulation results of small break loss of coolant accidents and status of light water reactor designs.
1.1.5.2 Technology advances in fast reactors and accelerator driven systems ***Duration:*** Recurrent ***Priority:*** 1	Proceedings of international conference on Material Research and Utilization of Accelerators; publications in the Nuclear Energy series on design features of advanced sodium cooled fast reactors with emphasis on economics; updated databases on fast reactors and accelerator driven system R&D.

Title, duration and priority	Main outputs
1.1.5.3 Technology advances for gas cooled reactors (GCRs) ***Duration:*** Recurrent ***Priority:*** 2	Publications in the Nuclear Energy series on: conservation and application of high temperature gas cooled reactor (HTGR) technology; potential of HTGRs in process heat applications; status of HTGR design and technology.
1.1.5.4 Common technologies and issues for small and medium sized reactors (SMRs) ***Duration:*** Recurrent ***Priority:*** 1	Publications in the Nuclear Energy series on: development of key enabling technologies common for SMRs of various types; non-technical factors that could facilitate deployment of SMRs in different countries; increased support to Member States planning to embark on or continue and expand nuclear programmes and considering SMR options (through the technical cooperation programme).

Subprogramme 1.1.6 Support for Non-electric Applications of Nuclear Power

Rationale: Currently, nuclear power contributes approximately 16% of the world's electricity. However, most of the world's energy use is for heat and transportation. Nuclear energy can make a significant contribution to these areas by providing a clean and sustainable source of energy. Co-generation has the additional benefit of significantly boosting the thermal efficiency of nuclear power plants.

The use of nuclear energy for the production of freshwater from seawater (nuclear desalination) is of broad interest in Member States due to acute water shortage issues in many arid and semi-arid zones. The desalination of seawater using nuclear energy (low temperature heat or electricity) is a demonstrated option, which could help meet the growing demand for potable water.

Hydrogen as an energy carrier is also receiving increasing attention, and nuclear energy is well placed as an efficient and clean source of energy for its production. Activities are being pursued in several Member States to realize hydrogen's potential in solving energy security, diversity and environmental needs. Member States can benefit from sharing information and knowledge, performing collaborative assessments, and pooling resources for conducting collaborative research on the production of hydrogen with nuclear energy. Such collaborations, as well as promotional activities, can facilitate the movement from today's fossil based energy economy to a future sustainable hydrogen economy.

Objectives:

— To increase the capability of Member States faced with water scarcity problems and interested in deploying nuclear desalination for alleviating these problems, in launching feasibility studies, performing economic evaluation and establishing nuclear desalination demonstration projects.

— To enhance information exchange, cooperative assessments, and collaborative research among Member States interested in nuclear hydrogen production and other high temperature processes, and in planning associated development and demonstration projects.

Outcome	Performance Indicators
— Use by Member States of information provided by the Agency on non-electrical applications of nuclear energy, and on means of safely and economically coupling the production systems with nuclear reactors.	— Number of Member States using Agency provided information and expertise on non-electrical applications of nuclear energy. — Number of Member States collaborating through the Agency to share information and to conduct collaborative R&D on the use of nuclear energy for non-electrical applications.

Programmatic changes and trends: Activities on nuclear desalination and other non-electrical applications, especially nuclear hydrogen production, will continue. The application of nuclear heat for various other industrial applications such as coal gasification, production of synthetic liquid fuels and heavy oil recovery have been of interest for many years and will also be reviewed within this new subprogramme.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 8.8% (€46 678) in 2008 compared with 2007 and no significant change in 2009 as compared to 2008, due to the maturing of the technology on desalination and the shifting of resources to areas receiving increased Member State interest.

1.1.6	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	494 638	499 907
Extrabudgetary	20 000	20 000
Unfunded	15 000	15 000

Projects

Title, duration and priority	Main outputs
1.1.6.1 Support for demonstration of nuclear seawater desalination ***Duration:*** Recurrent ***Priority:*** 2	A further improved Desalination Economic Evaluation Program (DEEP) computer code; reports on advances in nuclear desalination technologies, socioeconomic and environmental aspects of nuclear desalination and on economic research and assessment of nuclear desalination project; personnel trained in nuclear desalination technologies and economic evaluation.
1.1.6.2 Nuclear hydrogen production and other applications ***Duration:*** Recurrent ***Priority:*** 1	Publication on the potential of HTGRs in Process Heat Applications.

Programme 1.2 Nuclear Fuel Cycle and Materials Technologies

Rationale: The nuclear fuel cycle encompasses various processes and technologies related to exploration, mining and purification of uranium ores, conversion, enrichment, manufacturing of fuel pins and fuel assemblies, their utilization in reactors, storage of spent fuel, reprocessing for recovery of 'fissile' and 'fertile' materials, recycling of these materials and conditioning of the remaining waste for geological disposal. The present generation of nuclear power reactors, primarily LWRs and PHWRs, use LEU (currently < 5% U-235) and natural uranium, respectively. Plutonium is recycled as mixed oxide (MOX) fuel in LWRs. Fast reactors, expected to play a leading role in the future, will also use mixed plutonium/uranium fuel. Thorium, the other basic raw material for nuclear fuel is 'fertile' and is yet to be used on a large scale for fissile material production.

Due to the fact that large stocks of uranium have been available, for the last 15 years primary supplies of uranium from mines have covered only about two thirds of uranium demands. Expectations for nuclear growth and reduced secondary supplies have led to a rapid rise in the price of uranium in the last few years and increased activities for exploration and mine development. Uranium is more or less uniformly distributed in all six of the continents. But most of the uranium is mined and produced in Member States without a nuclear power programme and is consumed in Member States having no uranium. Uranium exploration, mining and milling operations must take into consideration not only technical issues, but also socioeconomic and environmental aspects of the operations in order to ensure sustainability of the uranium raw material industry.

Only a few countries have complete nuclear fuel cycle activities and programmes. Most countries having nuclear power reactors have an 'interim' spent fuel storage policy. Establishing a sustainable nuclear fuel cycle involves various technical, economical and political challenges, e.g. efficiency in fuel use, storage capacity for spent fuel, liabilities associated with waste management, and potential proliferation risks from civil plutonium utilization and associated security concerns. Also, legacies from the Cold War period involving nuclear fuels and materials still need to be resolved, e.g. the use of ex-weapons 'fissile' materials in the civil nuclear fuel cycle and the dismantling of nuclear submarines. The issues related to the 'back end' of the cycle are closely related to the sustainability of nuclear power. Appropriate management of spent fuel is a key issue for the steady and sustainable growth of nuclear energy. Long term storage of spent fuel is becoming a reality, with Member States referring to storage periods of 100 years or more. As storage periods are extended, there are new institutional and technical challenges. In the last few years, interest in reprocessing and recycling has increased, as evidenced by several international initiatives. Recycling of plutonium and other fissile and fertile materials, along with minor actinides, efficiently utilizes natural resources and improves waste management. However, several issues are required to be resolved in the recycling option.

As noted by General Conference resolutions GC(50)/RES/13.B, GC(49)/RES/12.F, GC(48)/RES/13.F, GC(47)/RES/10.C and GC(46)/RES/11.C, the nuclear fuel cycle should meet all requirements related to economics, non-proliferation, environmental protection, safety and security. The resolutions further request

Member States to combine their efforts under the aegis of the Agency to develop nuclear power and related fuel cycle activities accordingly, and the Secretariat to continue and strengthen, subject to the availability of resources, its efforts, focusing particularly on technical areas where the needs for improvement, advances and enhanced international collaboration are greatest.

The importance of the Agency's involvement in the management of spent fuel from power reactors has been noted on several occasions in meetings of the Board of Governors and is reflected in the Medium Term Strategy 2006–2011. The Agency has initiated multilateral nuclear approaches (MNAs) to the nuclear fuel cycle, with an initial focus on 'assurance of fuel supply and services' and 'assurance of non-proliferation'. There is a need to evolve technical solutions to these MNAs.

The programme is intended to play a catalytic role in the issues mentioned above, primarily by fostering and promoting exchange of information and experience, analysing data, identifying best practices in sustainable nuclear fuel cycle activities, and encouraging cooperation among Member States and with other international organizations such as the OECD/Nuclear Energy Agency and the World Nuclear Association.

Objective: To enhance and further strengthen the capabilities of interested Member States for policy making, strategic planning, technology development and implementation of safe, reliable, economically efficient, proliferation resistant, environmentally sound and secure nuclear fuel cycle programmes.	
Outcome	**Performance Indicators**
— Use of Agency guidelines, methods and procedures by interested Member States to plan and make policy, undertake research and development and implement safe, economic, proliferation resistant, environment friendly and sustainable nuclear fuel cycle activities.	— Number of Member States making use of Agency guidelines, methods and procedures. — Number of participants/organizations/Member States participating in Agency activities (e.g. technical meetings and CRPs) or contributing to databases and publications in the area of the nuclear fuel cycle and materials.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: The uranium raw material industry has revived dramatically in recent years after a slump of nearly two decades with an enhancement of uranium exploration, mining and milling activities all over the world. Accordingly, the Agency needs to increase its activities in the promotion of good practices, with due regard to environmental issues, through training events, workshops and technical meetings addressing the problem of ageing and reduction of a skilled workforce. The Agency's activities on uranium supply and demand analysis, fuel and fuel assembly behaviour and reactor water chemistry to promote development of high performance and high burnup fuels for water cooled reactors, and long term storage of spent fuel will continue. With higher burnup, understanding of radiation damage of fuel structural materials will be more important. The increasing interest in the closed fuel cycle and advanced fuels and fuel cycle systems will require increased Agency activities, as well as multilateral approaches for the fuel cycle and assurance of supply of fuel cycle services.

1.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 543 593	2 543 474
Extrabudgetary	397 177	397 177
Unfunded	107 251	160 251

Specific criteria for prioritization:

1. First priority is given to fuel cycle activities in support of the increasing use of nuclear power, ensuring the availability of raw material (uranium and thorium) and the efficient use of fissile and fertile materials through improved fuels and fuel recycling, while ensuring proliferation resistance.
2. Second priority is given to activities underpinning the development of best practices and the technical basis for safety guides in the front and back ends of the nuclear fuel cycle.
3. Third priority is given to activities fostering international cooperation and information exchange on nuclear fuel cycle issues.

Subprogramme 1.2.1 Uranium Resources and Production and Databases for the Nuclear Fuel Cycle

Rationale: Uranium demands are increasing and new uranium mines will be needed. Currently, most uranium is produced in Member States without a nuclear power programme and is consumed in Member States with little or no uranium production. New countries with limited experience of nuclear activities will be involved. This subprogramme will cover all aspects of: uranium geology and deposits; exploration methods and techniques; resources; reserves; supply and demand; production cycle activities, i.e. mining and processing including all environmental aspects of these activities and also databases for nuclear fuel cycle. A specific challenge comes from the lack of experienced staff around the world. Training activities will thus be important.

To ensure a global perspective for the supply and demand of uranium and for other aspects of the fuel cycle, the collection analysis and publication of worldwide data are important. For information on uranium production and demand the Agency collaborates with the OECD/NEA in producing Uranium Resources, Production and Demand (the 'Red Book'). Other databases that are needed concern nuclear fuel cycle installations, uranium deposits and conceptual models for fuel cycle calculations. It is also important to have authoritative and reliable information on the policies and trends in nuclear fuel cycle programmes worldwide. The information needs to be maintained, updated, revised, and, when appropriate, combined, integrated or linked with other databases from the Agency or other international bodies (e.g. OECD/NEA) to maximize synergies and facilitate consistency among data sets.

Objective: To improve the capability of Member States to understand, plan and develop nuclear fuel cycle programmes and activities, including uranium production, through the use of databases, publications, analyses and the various options and concepts as provided by the Agency.

Outcomes	Performance Indicators
— Increased use by Member States and other Agency entities of the information provided on nuclear fuel cycle including uranium supply and demand assessment and analysis. — Consideration and/or use in Member States of information and guidance provided by the Agency on good practices in uranium production.	— Extent of use by target groups in Member States of the information and analysis provided by the Agency in the area of the nuclear fuel cycle. — Extent of use by the Member States of Agency information and guidance in the area of the uranium production cycle.

Programmatic changes and trends: This subprogramme has a new title, Uranium Resources and Production and Databases for the Nuclear Fuel Cycle, to emphasize the importance of all aspects of the rapidly growing uranium industry. The focus is on improving the efficiency of the Agency's activities in uranium geology and deposits, uranium resources, supply and demand, uranium exploration and production, and nuclear fuel cycle databases.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a slight increase in 2008 compared with 2007 and in 2009 as compared with 2008. The increase is mainly needed to increase the training activities related to uranium exploration, mining and production, and to organize an international symposium on uranium raw material for the nuclear fuel cycle in 2009. Savings in other areas of the programme have been redeployed to strengthen activities in this subprogramme.

1.2.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	796 799	820 093
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.2.1.1 Updating uranium resources, supply and demand and nuclear fuel cycle databases ***Duration:*** Recurrent ***Priority:*** 1	Proceedings of the international symposium on uranium raw material for the nuclear fuel cycle (URAM-2009); in 2008, update and publication of Uranium 2007: Resources, Production and Demand; and update of 2009 edition; publications on and updating nuclear fuel cycle related databases (e.g. Nuclear Fuel Cycle Information Systems, World Distribution of Uranium Deposits).
1.2.1.2 Supporting good practices in uranium production ***Duration:*** 2006–2010 ***Priority:*** 2	Updated reports on good practices in the uranium production cycle; Member State specialists trained through the TC programme.

Subprogramme 1.2.2 Nuclear Power Reactor Fuel Engineering

Rationale: The effective and reliable performance of fuel is a major factor defining the competitiveness and safety of nuclear power production. Optimization of nuclear power plant operations brings about more demanding strategies, including extended burnup, longer fuel residence time, higher thermal rates and also greater operational flexibility, while still satisfying appropriate safety margins for normal, transient and accident conditions and decreasing fuel failure rates.

To address these issues, the degradation and corrosion of the properties of nuclear material should be understood and corresponding mechanisms and models developed. High burnup properties are also being studied, as are primary coolant technologies, water chemistry management, new irradiation and corrosion resistant materials and advanced fuel designs and technologies. Taking into account the increasing costs and duration of direct irradiation experiments, the role of simulation and modelling is growing.

Fundamental scientific developments in the area of radiation materials science require advanced characterization and examination techniques that are available only in a limited number of large research centres. This underlines the importance of international collaboration involving countries with less developed research infrastructure. Precision and sufficiency of experimental data on the processes occurring in irradiated fuel allow better understanding and accurate modelling of fuel behaviour under operational conditions.

The Agency is the only independent and non-commercial organization that provides a forum for the exchange of knowledge and for the promotion of best practices in the technical, scientific and safety aspects of the use and reliability of nuclear fuel and fuel assemblies. It is also well placed to promote the harmonization of fuel fabrication technologies and associated QA/QC, as well as QMS/EMS development according to the highest international standards.

This subprogramme focuses on the exchange of information on fuel and fuel assembly design, fabrication, performance and modelling under normal, transient and accident conditions — the lessons learned may well become a reference for Member States that operate or plan to operate reactors of different design. It is concerned as well with R&D work on advanced fuels for evolutionary and innovative reactors and fuel cycles.

Objective: To improve, through the transfer of information and by sharing experience, the capability of interested Member States to optimize in-pile fuel performance, and to develop advanced technologies for ensuring reliability and economic efficiency in nuclear fuel utilization, while adhering to appropriate safety margins.

Outcomes	Performance Indicators
— Use in interested Member States of information provided by the Agency, and the experience exchanged, to gain a better, quantitative understanding of the mechanisms of the in-pile behaviour of fuel, core and coolant circuit components in normal, transient and accident conditions and the use of this understanding in improving fuel performance.	— Organizations in Member States relying on, or considering, advanced technology for improving power reactor core and primary circuit material performance for enhanced utilization, economics and reliability of the fuel, on the basis of information provided by the Agency.

Outcomes	Performance Indicators
— Improvements in the methodology for design, fabrication and safe utilization of current and advanced fuel in Member States with different reactor designs on the basis of information provided by the Agency and experience exchanged.	— Ability of Member States with different reactor systems to understand and model fuel behaviour in other systems on the basis of information and experience made available by the Agency. — Extent of dissemination/harmonization of advanced methodologies for water reactor fuel design, fabrication and utilization in interested Member States on the basis of information and experience made available by the Agency.

Programmatic changes and trends: The Agency's activities in fuel performance and technology have focused on information exchange in the development of fuel and coolant technologies, and the harmonization of advanced methodologies for fuel design, fabrication and utilization for water cooled reactors. Advances in core corrosion monitoring and control, mechanisms of hydride degradation of cladding Zr alloys and in validation/verification of national fuel performance codes will be provided to interested Member States through CRPs on water chemistry (FUWAC), delayed hydride cracking (DHC-II) and fuel modelling (FUMEX-III), respectively.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a slight decrease in 2008 as compared with 2007 and in 2009 as compared with 2008, due to the transfer of funds to higher priority subprogrammes within the programme. Better coordination to avoid duplication with other programmes and with external events has resulted in a more efficient use of resources.

1.2.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	566 623	555 239
Extrabudgetary	—	—
Unfunded	31 500	51 500

Projects

Title, duration and priority	Main outputs
1.2.2.1 Supporting the sharing of experience in the development and use of fuel structural materials and water chemistry management in nuclear power plants ***Duration:*** 2006–2011 ***Priority:*** 2	Publications on: optimization of water chemistry technologies and management (FUWAC); and delayed hydride cracking of zirconium alloy fuel cladding (DHC).
1.2.2.2 Promoting good fuel performance and operating practice for current fuel types in water cooled power reactors ***Duration:*** 2006–2012 ***Priority:*** 2	Reports covering water reactor fuel performance and technology; factors influencing fuel reliability/failure rates of BWR/PHWR/PWR/WWER fuel assemblies; and high burnup fuel experience and economic impact.
1.2.2.3 Promoting best practices in fuel design and manufacturing ***Duration:*** 2006–2011 ***Priority:*** 1	Publications on: fuel rod instrumentation; in-pile and post-irradiation examination and poolside inspection techniques; improved pellet materials and designs to ensure reliable behaviour of nuclear fuel at water cooled power reactors; instrumented fuel rods for irradiation testing and in-pile management techniques; and QMS, QA/QC in fuel design, manufacturing and procurement.

Subprogramme 1.2.3 Management of Spent Fuel from Nuclear Power Reactors

Rationale: Spent fuel from nuclear power reactors requires safe, secure, environmentally sound and efficient management. Appropriate management of the increasing quantities of spent fuel is a key issue for the steady and sustainable growth of nuclear energy. With a majority of Member States still undecided whether or not to reprocess fuel, and with no repositories for spent fuel or high level waste in operation, long term storage continues to remain a reality. More than four hundred nuclear power reactors are in operation today and a large amount of spent fuel is stored either at or away from the reactor sites. A major issue in many countries is thus the need to expand existing capacities at reactor sites or provide additional storage space. Also, the long term aspects of storage, with periods of 100 years and even beyond, constitute new institutional and technical challenges, e.g. the management of liabilities, knowledge, experience and information over times spanning several generations, and the longevity of spent fuel packages and structural materials of storage facilities.

In recent years, interest in spent fuel treatment, including reprocessing, recycling and conditioning, have increased, which can be seen from several national and international initiatives. Reprocessing and multiple recycling of all actinides will facilitate efficient utilization of natural resources and improved waste management. This subprogramme will address spent fuel treatment options, while advanced fuels and fuel cycles will be addressed in Subprogramme 1.2.4.

The importance of the Agency's involvement in the management of spent fuel from power reactors has been noted on several occasions in meetings of the Board of Governors and is reflected in the Medium Term Strategy 2006–2011. As concluded at the 2006 conference on the management of spent fuel from nuclear power reactors, the evolving international scene has made spent fuel management one of the more important factors influencing the future of nuclear energy. Fostering the application of good practices and sharing of experience is a particularly relevant task for the Agency in discharging responsibility and functions according to its Statute (Article III, A/3) and to achieve Goal A in the Medium Term Strategy 2006–2011. In addition, signatory countries of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management can benefit from the Agency's efforts to foster the application of good practices in the spent fuel management area. Regional cooperation and approaches are seen to provide both attractive and challenging prospects for Member States, for instance from the economic, safety, environmental and security points of view.

Objective: To improve the capability of interested Member States to plan, develop and implement safe, environmentally sound and efficient spent fuel management by the identification and mitigation of problems, using information and guidance provided by the Agency.

Outcomes	Performance Indicators
— Increased use by Member States with nuclear power plants of Agency guidance in the planning or implementation of national programmes for power reactor spent fuel management. Improved implementation of spent fuel management programmes in Member States.	— Number of Member States benefiting from Agency spent fuel management activities, using information or guidance by the Agency for the planning or implementation of state of the art technologies in spent fuel management facilities or improving spent fuel storage and management conditions.
— Improved cooperation between Member States in sharing information and collaborating on spent fuel management.	— Number of Member States using information or guidance by the Agency for the planning or implementation of state of the art technologies in spent fuel storage facilities or improving spent fuel storage and management conditions.

Programmatic changes and trends: This subprogramme has prioritized issues associated with the long term storage of power reactor spent fuel. As Member States are expressing renewed interest in spent fuel recycling, the activities to track developments in spent fuel treatment (reprocessing, conditioning) will increase. The emphasis will be on the development of guidance and information related to growing storage quantities and durations as well as growing interest in treatment options.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a minor decrease in 2008 as compared with 2007 and a decrease of 6.1% (€32 900) in 2009 as compared to 2008. The funds were transferred to higher priority subprogrammes within the programme.

1.2.3	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	554 204	520 201
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.2.3.1 Promoting strategies for spent fuel management ***Duration:*** 2004–2010 ***Priority:*** 2	Publications on systems integration in spent fuel management and methodologies and tools in spent fuel management economics.
1.2.3.2 Providing technical guidance on good practices for long term management of spent fuel ***Duration:*** 2006–2011 ***Priority:*** 2	Publications on: burnup credit applications; influence of high burnup and MOX fuel and on spent fuel management; and spent fuel treatment options. Proceedings of the international conference on management of spent fuel from nuclear power reactors in Member States. Organization of a CRP on spent fuel performance assessment and research (SPAR).

Subprogramme 1.2.4 Topical Issues of Nuclear Fuels and Fuel Cycles for Advanced and Innovative Reactors

Rationale: In recent years, a number of new international initiatives and cooperation are under way in the development of advanced fuels and fuel cycle technologies for fast reactors, HTGRs and SMRs. Evolutionary, advanced and innovative fuel cycles can make the use of fissile and fertile materials more effective, and lead to improvements in economics, safety, proliferation resistance and environmental concerns and impacts. The new technologies and concepts include stainless steel cladding, metallic and non-oxide ceramic and inert matrix fuels for fast reactors, multi-layer coated particle fuel in graphite matrix for HTGRs and robust SMR fuels with long core life. For fast reactors, it is essential to develop various 'closed' fuel cycle options with intrinsic proliferation resistance. In addition, there is a need to develop structural materials for fast reactor fuel assemblies that are resistant to irradiation damage at high fast neutron fluence. For HTGRs, the focus is high burnup fuel and the backend. It is also essential to maintain and update the country nuclear fuel cycle profiles and the database on minor actinides. However, the main objectives in all these activities are 'proliferation resistance', minimization of the environmental burden and management and utilization of fissile and fertile materials, including ex-defence plutonium and HEU, reprocessed and depleted uranium, minor actinides and thorium.

The Agency will focus its efforts within this subprogramme on the transfer of information and experience and the fostering of cooperation in nuclear fuel cycle issues. This is in accordance with Objectives A.2 and A.3 of the Medium Term Strategy 2006–2011 to meet the needs of Member States in addressing nuclear fuel cycle issues and concerns by identifying, assessing and documenting the current status, trends and emerging technologies for various options for the entire nuclear fuel cycle, and in obtaining authoritative and factual information on the complex issues involved.

Objectives:

- To enhance the capability of interested Member States to build up advanced or innovative technologies by promotion of information exchange, including the assessment of the constructive use of such innovative technologies to resolve some of the issues associated with existing nuclear fuel cycles for sustainable growth of nuclear energy.
- To increase the capability of interested Member States to develop technologies through information exchange on the management of fissile and fertile material and facilitate knowledge

Outcomes	Performance Indicators
— Development of nuclear fuel cycle technology in interested Member States for sustainable nuclear energy.	— Use made by target groups in Member States of the technologies and experience, analysis and information systems provided by the Agency in the area of innovative nuclear fuel cycles and nuclear materials management.
— Use in interested Member States of the information and technology insights provided by the Agency for planning improvements, from a sustainability and proliferation resistance point of view.	— Use in or by Member States of the Agency's information on the management options for the various nuclear materials and nuclear fuel cycles.

Programmatic changes and trends: Subprogramme 1.2.4 is now entitled "Topical issues of nuclear fuels and fuel cycles for advanced and innovative reactors". This reflects the increased emphasis on nuclear fuels and fuel cycles for advanced reactors, especially on aspects and materials that require a cross-cutting approach.

In 2008–2009, this subprogramme will also place additional emphasis on basic research of nuclear materials and radiation damage that is of common value for all reactor types. These activities will be jointly planned and implemented by the Department of Nuclear Energy and the Department of Nuclear Sciences and Applications.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a minor increase in 2008 as compared with 2007 and in 2009 as compared to 2008. Better coordination to avoid duplication between programmes and with external events has resulted in a more efficient use of resources.

1.2.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	625 967	647 941
Extrabudgetary	397 177	397 177
Unfunded	75 751	108 751

Projects

Title, duration and priority	Main outputs
1.2.4.1 Supporting nuclear fuels and fuel cycle activities of fast reactors, HTGRs and SMRs with long core life ***Duration:*** 2006–2011 ***Priority:*** 2	Publications on: reuse options of reprocessed uranium; innovative and advanced fuels for thermal and fast reactors; and fuel cycle aspects of selected reactor types.
1.2.4.2 Supporting fissile and fertile materials management and proliferation resistance ***Duration:*** 2004–2011 ***Priority:*** 1	Publications on: proliferation resistance of transuranium elements in the nuclear fuel cycle; and protected plutonium production.

Programme 1.3 Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development

Rationale: Prompted by high international market prices for fossil fuels, concerns about supply security and a quest for stable and reliable electricity supplies as well as protection of the environment, numerous Member States are in the process of revisiting the nuclear option. Moreover, all plausible long term energy scenarios project significant and continuing expansion of energy demand worldwide, especially if the United Nations Millennium Declaration on poverty eradication and the Plan of Implementation agreed at the World Summit on Sustainable Development (WSSD) are to be met. The demand for energy is projected to grow fastest in developing countries. Consequently, nuclear energy is expected to play a greater role in meeting future energy requirements.

The current and expected future expansion of nuclear power in developing countries creates a need for capacity building in the areas of nuclear knowledge and nuclear information, energy–environment planning and comparative assessment of different energy options in these countries. In addition to comprehensive energy system modelling and planning, capacity building in the nuclear context embraces all activities required to support informed decision making on issues surrounding the full life cycle of nuclear power. This includes aspects ranging from national energy demand and supply planning, including energy demand and supply options, to technology, fuel cycles, waste management, economics, environment, safety and non-proliferation.

All these aspects reflect one common requirement, i.e. the need to ensure continuity and further development of nuclear knowledge and information transfer. This is particularly important because information and knowledge have become one of society's fundamental resources and human-made assets. Nuclear knowledge management, the International Nuclear Information System (INIS) and the IAEA Library are instruments in preserving and enhancing these assets.

The Agency's Member States need to develop or enhance the indigenous capacity for comprehensive energy system planning, including nuclear power, consistent with their national sustainable development objectives, and requests for assistance to that extent are routinely forthcoming.

Objectives:

— To enhance the capacity of Member States to perform their own analyses of electricity and energy system development, energy investment planning and energy-environment policy formulation and their economic implications.

— To sustain and effectively manage nuclear knowledge and information resources for the peaceful uses of nuclear science and technology.

Outcomes	Performance Indicators
— Increased reliance of energy policies and investment decisions in Member States, particularly in developing countries and countries with economies in transition, on Agency methodological tools and analyses.	— Number of Member States using the Agency's assessments and analysis tools related to energy system and investment planning or energy–environment policy formulation and their economic implications.
— The Agency regarded by Member States and international organizations as an objective, wide ranging and continuously improving source of quality information on nuclear energy and its peaceful applications.	— Number of cooperative ventures, presentations and other interactions of the Agency with other international organizations. — Number of Member States satisfied with the availability and quality of nuclear knowledge and information services with direct or indirect impacts on their national nuclear programmes.
— Member States managing their nuclear knowledge effectively and efficiently.	— Level of access and use of information resources and services.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Strengthening local capabilities in planning for sustainable energy development, and for assessing the potential role for nuclear power in meeting future energy needs, is one of the most effective services to Member States under Programme 1.3. An integral part of capacity building is access to nuclear information and knowledge for Member States and the Secretariat. The need for authoritative and objective information, preserved nuclear knowledge and advanced education has gained in importance as Member States increasingly explore the nuclear option and understand the framework conditions under which nuclear power can contribute to their national sustainable development objectives. Part of the information and knowledge dissemination is the programme's contribution to the international debates on nuclear power and sustainable development and clarifying the positive role nuclear power may play in mitigating climate change. Programme 1.3 is gearing up to meet increasing needs by further enhancing its productivity through: expanded regional level activities; introduction of web based distance learning; removing barriers to access of information and knowledge services; networking; and seeking partnerships.

1.3	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	10 278 727	10 279 018
Extrabudgetary	—	—
Unfunded	—	—

Specific criteria for prioritization:

1. First priority is given to regional activities and training, including distance learning to strengthen the capabilities of Member States in planning sustainable energy development and assessing the role of nuclear power.
2. Second priority is given to activities supporting nuclear knowledge management.
3. Third priority is given to activities for keeping fair consideration of nuclear power in the international debate on sustainable development and climate change.

Subprogramme 1.3.1 Energy Modelling, Data and Capacity Building

Rationale: Designing appropriate energy strategies to support sustainable development in a country entails a comprehensive evaluation of energy supply and technological options in terms of their social, economic and environmental impacts. With increasing globalization and regional integration, such an evaluation has to include regional development possibilities beyond national borders. All this requires reliable data and information, appropriate analytical tools and adequately trained personnel. Many Member States, particularly in developing countries and in countries with economies in transition, lack local expertise and experience in these areas. This weakness was also identified by the Commission on Sustainable Development as one of the obstacles to satisfactory progress towards achieving the Millennium Development Goals.

Accordingly, this subprogramme is designed to provide the necessary data, up to date information and suitable analytical tools, and to build local analysis capacity and capabilities, so that Member States can conduct national studies for elaborating their sustainable energy strategies and making sound energy decisions.

Objective: To strengthen the capacity and capabilities in Member States to elaborate their sustainable energy strategies and conduct studies for energy system and electricity sector development and management, energy investment planning and energy environment policy formulation.

Outcome	Performance Indicators
— Utilization of Agency analysis tools, experts trained in the use of these tools to conduct independently comprehensive energy environment analyses.	— Number of requests for Agency analytical tools (energy models) by Member States and other international organizations. — Number of experts from Member States trained in the use of Agency energy models.

Programmatic changes and trends: Given the increased demand for energy analysis in Member States, the activities under this subprogramme will: shift its focus to assisting Member States in their energy–environment analysis and planning efforts; further develop distance learning methodologies; train trainers to cope with the expected higher workload; and continue building analysis capacity and capabilities in Member States.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 8.1% (€112 936) in 2008 as compared with 2007 and no change in 2009 as compared with 2008, due to the large increase in Member State requests for national and regional energy analyses. Efficiency gains will be accomplished by expanding regional level activities and introducing IT and web based distance learning.

1.3.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	1 544 383	1 544 384
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.3.1.1 Energy, electricity and nuclear power economics: Databanks on status and trends ***Duration:*** Recurrent ***Priority:*** 2	Annually updated information on status and trends of energy and electricity supply and demand patterns, availability of energy resources, technology developments and economics; updated projections on energy and electricity use and nuclear power development in different world regions; information for the Nuclear Technology Review; updated internal and external web sites; annual publications such as Reference Data Series No. 1 (RDS-1) and Nuclear Technology Review.
1.3.1.2 Energy models and capacity building for sustainable energy development ***Duration:*** Recurrent ***Priority:*** 1	Enhanced analytical tools (models) for elaborating sustainable energy strategies, applicable in widely diverse country situations.

Subprogramme 1.3.2 Energy Economy Environment (3E) Analysis

Rationale: The Agency is required by its Statute to promote the contributions of peaceful nuclear technology to socioeconomic development. Moreover, General Conference resolutions have called for more active Agency involvement in the debate on nuclear power and its contribution to sustainable development. The Agency, the only UN institution actively pursuing studies on nuclear technologies and sustainable development is uniquely qualified to undertake 3E analysis against the backdrop of a constantly shifting balance among social, economic and environmental priorities.

Objective: To achieve better understanding of nuclear technology's contributions to socioeconomic development and climate protection and its compatibility with national sustainable development objectives in Member States.

Outcome	Performance Indicator
— Agency considered by Member States and other international organizations as a competent partner in addressing sustainable energy development issues and as an objective and up to date source of information on nuclear technology in the context of sustainable energy and economic development.	— Number of instances where Agency economic or 3E analyses are requested, or incorporated into the decision making process of Member States or other agencies or offices.

Programmatic changes and trends: The activities in this subprogramme will focus on keeping the nuclear option open as appropriate in Member State sustainable development strategies. One new emphasis will be on more targeted economic assessments of various aspects of nuclear technologies and their potential for future contributions to sustainable development. Another will be on translating more specifically into Member State sustainable development strategies, the outcomes of international climate change and sustainable development negotiations, particularly as these relate to the future contribution of nuclear power in these spheres.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 17% (€237 189) in 2008 as compared with 2007 and no change in 2009 as compared with 2008, primarily due to the redeployment of staff to strengthen initiatives such as the Nuclear Power Support Group (NPSG) and Nuclear Energy Series and the Continuous Improvement Group. Harmonization in the preparation and production of reports, documents and presentation materials and regular monitoring of the progress of various tasks should result in efficiency gains.

1.3.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 185 221	1 185 223
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.3.2.1 Technoeconomic analysis ***Duration:*** 2008–2011 ***Priority:*** 2	Selected cost studies (feasibility studies, cost comparisons, cost effectiveness and cost–benefit assessments); economic analyses of risks, regulatory responses and regionalization of the fuel cycle; assessments of economic factors affecting nuclear technology innovation; comparative assessments of different energy systems or their attributes.
1.3.2.2 Topical issues related to sustainable energy development ***Duration:*** Recurrent ***Priority:*** 1	Reports and presentations on topical issues related to sustainable development and climate change, and especially on the potential contribution of nuclear technologies; case studies and country profiles analysing sustainable energy development strategies.

Subprogramme 1.3.3 Nuclear Knowledge Management

Rationale: The nuclear industry, and many academic, research and government institutions dealing with nuclear science and technology, are facing the challenge of a massive generation change caused by retirement and attrition. The result can be a damaging loss of the knowledge and skills accumulated in the course of the last forty years of operation of the current nuclear facilities. These developments require the collection and preservation of increasing amounts of technical and scientific data, information and knowledge, and the development of human resources to sustain the operation and (later on) decommissioning of existing installations.

Scenarios of the continuing expansion of global energy demand project growing requirements for nuclear energy. Support for keeping the nuclear option open will require not only assured continuity but also further development of nuclear knowledge, in particular to support the development of new and innovative designs. In parallel with technical innovations, a new generation of engineers and scientists needs to be educated and trained for the R&D, design, licensing, building and operation of new installations. Effective management of nuclear knowledge thus involves ensuring the continued and enhanced availability of both scientific and technical knowledge and qualified personnel.

This subprogramme, being cross-cutting in nature, will continue to exploit synergies among all programmes within Major Programme 1 as a resource of nuclear information and knowledge, especially between INIS and the IAEA Library. Synergy and cooperation will also be sought with other programmes in nuclear safety, nuclear applications and technical cooperation.

Objectives:

— To meet the needs of Member States in nuclear knowledge management in the fields of nuclear science and technology through the development and dissemination of guidance and tools as well as their implementation in national programmes.
— To enhance the synergy of the Agency's nuclear information and knowledge resources and services.

Outcome	Performance Indicators
— Member States apply nuclear knowledge management methodology and tools for nuclear knowledge preservation, capacity building and innovation in the area of nuclear science and technology.	— Number of Member States participating in and/or supporting the Agency's nuclear knowledge management activities. — Number of nuclear knowledge management activities initiated in Member States and supported by the Agency.

Programmatic changes and trends: By 2008, nuclear knowledge management is expected to be an important activity in the nuclear sector in Member States using nuclear technology. The strategic elements (structure) of the subprogramme will remain the same, the main adjustment on the project/activity level being support for an increasing number of TC projects.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 6.5% (€109 084) in 2008 as compared with 2007 and an increase of 1.7% (€30 500) in 2009 as compared with 2008. Various General Conference resolutions have reiterated the importance of nuclear

knowledge management and as a result of restructuring due to the high priority of this subprogramme, two posts from Subprogramme 1.3.4, International Nuclear Information System (INIS) have been transferred here. This subprogramme has been able to build on efficiency gains in INIS.

1.3.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 823 805	1 855 194
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.3.3.1 Methodology and guidance for implementing nuclear knowledge management ***Duration:*** 2008–2009 ***Priority:*** 1	Publications on: national approaches and strategies for nuclear knowledge management; process oriented knowledge management; community of practice in nuclear knowledge management to promote industry benchmarks and performance improvements.
1.3.3.2 Facilitating sustainable education and training in nuclear science and technology ***Duration:*** Recurrent ***Priority:*** 1	Publication on forum on nuclear education; Internet platforms for distance learning; benchmark curricula; catalogue of nuclear education resources.
1.3.3.3 Supporting knowledge maintenance, analysis and integration ***Duration:*** Recurrent ***Priority:*** 1	Enhanced nuclear energy knowledge portal; progress reports on the Fast Reactor Knowledge Preservation Initiative; progress reports on the CRP on knowledge preservation; enhanced web based Nuclear Information Archive (NuArch); handbook on nuclear knowledge management products and services; handbook on knowledge services for nuclear power plants; regular updates of the Agency's directory of Meetings on Atomic Energy.

Subprogramme 1.3.4 International Nuclear Information System (INIS)

Rationale: The International Nuclear Information System was established in 1969 and operates on a cooperative basis under Membership Arrangements (GOV/INF/2000/21). As the INIS Secretariat, the Agency is responsible for the management and coordination of INIS, including input processing, distribution of products and services to members, and the organisation of meetings. INIS remains the largest Agency information resource in nuclear science and technology.

Nuclear information of interest to Member States is now available on the Web and in a variety of commercial and governmental databases. Gateways will be developed to provide access for Member State users to external relevant databases. This will be accomplished through the development of partnerships with information providers in Member States.

Objective: To meet Member State needs for a wide range of information resources to support their nuclear programme and activities.

Outcome	Performance Indicators
— Access for Member States and the Agency to comprehensive nuclear information within and beyond INIS.	— Level of access and utilization of INIS products and services by customers. — Level of INIS member activities in maintaining INIS.

Programmatic changes and trends: The primary focus will be moved to content management to ensure a high level of information quality referenced in the bibliographic database and its integration with other trusted nuclear information resources available in Member States.

This subprogramme will continue its efforts to achieve comprehensiveness by developing and enhancing partnerships with INIS members, international organizations, information providers and publishers, and the

nuclear industry. Synergy with the IAEA Library will be further enhanced through joint projects and activities. INIS will assist in the development of a culture of knowledge sharing amongst Member States. Finally, INIS products and services will become multilingual.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 9.4% (€296 911) in 2008 as compared with 2007 and a decrease of 1.1% (€30 500) in 2009 as compared with 2008. Through the strengthening of synergies between this subprogramme and Subprogramme 1.3.3, Nuclear Knowledge Management, it has been possible to reallocate resources to Programme 1.1, Nuclear Power, to strengthen activities to support the development of innovative technologies and approaches to supporting nuclear power infrastructure development, which have been given new and high priority by the Agency's Member States.

1.3.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 945 825	2 914 724
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.3.4.1 INIS policy, planning, development and production ***Duration:*** Recurrent ***Priority:*** 1	Policy advice and technical recommendations for the development of INIS; agreement with INIS partners; enhanced interfaces to INIS products, new or revised data capturing and processing tools; INIS Atomindex file updates; INIS electronic non-conventional literature collection updates; INIS bibliographic standards and authorities; updated INIS Reference Series; INIS Multilingual Thesaurus and INIS preservation archives.
1.3.4.2 INIS products, services, outreach, capacity building and partnerships ***Duration:*** Recurrent ***Priority:*** 1	INIS Database on the Internet (with on-line full text access); INIS Full-text Database; INIS Database on CD/DVD-ROM; INIS NCL on CD/DVD-ROM; OECD/NEA computer program database; distance learning programme; promotional materials for INIS and nuclear knowledge management; INIS web site; INIS & NKMS Newsletter; trained personnel; enhancement of national INIS centres; joint marketing plan for INIS; user surveys.

Subprogramme 1.3.5 Library and Information Support

Rationale: As cross-functional teams work together more frequently and as partnerships with Member States proliferate, collaborative and synergetic approaches to effective information services are expected to increase in volume inside and outside of the Agency. The exchange of information and knowledge is a pre-requisite for successful cooperation and partnerships. The IAEA Library's mission is to meet these information needs in all areas of the Agency's programmes and to provide library and information services to the Agency staff, members of Permanent Missions located in Austria, official participants of meetings convened by the Agency and Permanent Observers accredited to the Agency, as well as to staff of nuclear research institutions, information centres and libraries in Member States. Of particular importance is the Library's support of nuclear knowledge maintenance. As coordinator of the International Nuclear Library Network, the IAEA Library fosters cooperation and resource sharing between nuclear information centres and libraries worldwide, thus providing access, managing and using an enlarged information pool without generating additional costs to the Agency and its Member States. In order to meet present and future information needs of the Agency and its Member States, the IAEA Library will adopt a client focused culture of service, making available, preserving and promoting relevant, targeted information products and services.

Objective: To enhance the ease of access to relevant and up-to-date in-house and external Library services and products in order to better meet the present and future information needs of the Agency and Member States.	
Outcome	**Performance Indicator**
— Effective and efficient library services and products.	— Extent of meeting user requests for information services and their satisfaction with the services provided.

Programmatic changes and trends: Knowledge acquisition and preservation will be streamlined and strengthened through: the exploitation of synergies with in-house nuclear information resources; enlargement of the information pool available to the Agency and Member States through expanded partnerships with and among nuclear libraries worldwide.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. Efficiency gains are being sought by reviewing subscriptions and similar purchase arrangements.

1.3.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 779 493	2 779 493
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.3.5.1 Development and maintenance of the IAEA Library's information resources ***Duration:*** Recurrent ***Priority:*** 1	Quality, up to date and readily accessible collection of internal and external information resources responding to the present and future information needs of the Agency and Member States.
1.3.5.2 Provision of library services and information support ***Duration:*** Recurrent ***Priority:*** 1	Access to internal and external print, electronic, and audiovisual information resources.

Programme 1.4 Nuclear Science

Rationale: The peaceful uses of nuclear technologies, for both electrical power production and non-power applications, are dependent on a thorough understanding of the principles and application of nuclear science. The recent revival of interest in nuclear power and the continuing widespread application of radioisotopes and ionizing radiation in various fields, emphasize the need for further Agency involvement in nuclear science, especially in the coordination of the world wide efforts.

Research reactors have been the cradle of nuclear science development in most parts of the world and their applications remain important in several areas. Since most are relatively old and suffer from a lack of sustained resources, their utilization has been low in a number of cases. Agency activities in the area of research reactors include inter alia support for developing strategic utilization plans (SUP) consistent with the features of such reactors and fostering regional cooperation. Stronger facilitation of the networking among all stakeholders is essential for better synergy between research reactor operators/service providers and end users. In order to support Member States' efforts being implemented, among others, in the framework of the Reduced Enrichment for Research and Test Reactors (RERTR) programme, or the US Global Threat Reduction Initiative (GTRI), the Agency will continue its support of activities minimizing the use of high enriched uranium (HEU) in research reactors and other experimental facilities, through facilitating the conversion to low enriched uranium (LEU) fuels and the use of LEU targets for molybdenum-99 production. The reliable operation of research reactors with appropriate features is a key factor in fostering the development and testing of new fuels and structural materials.

Applications of particle accelerators will be focused on materials science and networking, and collaborations to facilitate interdisciplinary initiatives (physics, chemistry, biology, medicine). The coordinated research efforts under way on ion beam analysis and pulsed neutron sources will lead to new initiatives in materials research of relevance for both the nuclear and non-nuclear fields. Materials science studies using accelerators, neutron beam techniques and analytical methods are relevant to advanced reactors, nuclear fuel cycle needs and fusion research. Capacity building to meet equipment and instrumentation needs for the effective utilization of accelerator and other related facilities and greater coordination in the area of accelerator-driven systems (ADSs) and in accelerated ageing studies on materials are envisaged. The training and technical information service support to Member States in the area of applications of nuclear spectrometry is a recurrent activity of continuing importance for several developing countries.

The signing in June 2005 of the declaration to start construction of the International Thermonuclear Experimental Reactor (ITER) at Cadarache, France, signalled an important new stage in the development of fusion energy. The Agency will foster the involvement of interested Member States in fusion research and facilitate links with ITER partners, and will also take into account the fusion path to the DEMO facility. Closer linkage of fusion and fission technology development, particularly in the area of materials science, will create synergies benefiting nuclear power. Materials science studies cited earlier are also relevant to fusion research.

The entire range of nuclear applications outlined above is firmly embedded in the development and availability of high quality atomic and nuclear data that need to be readily available and applicable to all users in Member States. Thanks to worldwide cooperative efforts fostered through the Agency, data development, compilation and evaluation to produce the essential data libraries, as well as the provision of database services to users around the world, are being rigorously addressed. By networking with other major international data service providers, the Agency ensures support for needs based data development work related to advanced fuel cycles, transmutation, medical applications, analytical techniques and fusion research. Progress in the planning of ITER and the design of the International Fusion Materials Irradiation Facility (IFMIF) has necessitated a large amount of additional data.

A number of developing Member States seek technical cooperation assistance from the Agency to strengthen their nuclear science capabilities and derive benefits from their applications. The Nuclear Science Programme has accordingly been formulated to respond to such requirements, making use of advice from SAGNE, external experts and the recommendations of the International Nuclear Data Committee and International Fusion Research Council (IFRC).

Objective: To increase Member State capabilities in the development and application of nuclear science as a tool for their technological and economic development.	
Outcomes	**Performance Indicators**
— Increased international cooperation in nuclear sciences for technological advancement.	— The number of institutions and number of Member States participating in the Agency's nuclear science activities and the number of resultant products/documents.
— Greater use of Agency databases on atomic and nuclear data for both nuclear energy systems and non-power applications.	— The extent of demand for the Agency's atomic and nuclear data and related services.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Lessons learned for this programme, as reported in programme performance reports, evaluations and reviews, include the value of holding Agency technical meetings alongside or back-to-back with other international scientific events; the need to address performance limitations shown by UMo/Al dispersed fuel; the greater user friendliness of the newly developed Linux based systems for atomic and nuclear data libraries relative to the old alpha data handling systems; and the advantage, in terms of keeping up with current developments and seeking synergistic benefits, of the involvement of the Agency in major international initiatives in nuclear science without being a direct partner, as is the case with ITER. The Agency's Programme and Budget 2008–2009 includes work to address the performance limitations of UMo/Al dispersed fuel and will continue using the newly developed Linux based systems for atomic and nuclear data libraries.

1.4	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	9 057 720	9 058 283
Extrabudgetary	462 747	327 747
Unfunded	446 309	620 536

Specific criteria for prioritization:

1. First priority is given to activities in support of emerging development needs in nuclear power and non-power applications in the areas of atomic and nuclear data and database services, materials science aspects, interdisciplinary applications of accelerators, and activities to reduce the proliferation risks of using HEU.
2. Second priority is given to activities to strengthen: (a) research reactor management and effective utilization; and (b) advanced training for human resource development in nuclear sciences.
3. Third priority is given to activities fostering international cooperation and information exchange in nuclear fusion research and plasma physics.

Subprogramme 1.4.1 Atomic and Nuclear Data

Rationale: All applications of nuclear technology depend on atomic and nuclear data of high quality to provide accurate descriptions of the underlying processes employed for use in both energy generation and non-energy studies. Necessary data include reaction cross-sections, atomic and nuclear properties of the resulting reaction products, and quantification of the prompt and delayed decay characteristics. While these data are reasonably well defined for some applications, much remains to be done in various areas.

Over the 2008–2009 biennium, work related to advanced fission and fusion reactor design, nuclear medicine and nuclear based analytical techniques will continue to be pursued. The Agency also takes a lead role in coordinating specific international networks and by undertaking in-house studies that assist greatly in the establishment and maintenance of a wide range of libraries dedicated to experimental, theoretical and evaluated atomic, molecular and nuclear data. The Agency also considers and exploits advances of information and computer technology to improve data communications and services to all Member States.

Beneficiaries within Member States are fission and fusion reactor designers and operators, reprocessing facility operators, designers of fuel transport and radioactive waste storage facilities, and physicists and analysts involved in various non-energy applications (e.g. nuclear medicine, materials analysis and environmental monitoring).

Objective: To increase capabilities and expertise of Member States to ensure the safe and economic adoption of all forms of nuclear technologies by providing rapid access to reliable atomic and nuclear data for energy and non-energy applications**.**

Outcome	Performance Indicator
— Adoption by Member States and use of Agency atomic and nuclear data generated from CRPs and other routes, leading to their establishment as internationally accepted databases.	— Extent of use by Member States of Agency recommended sets of atomic and nuclear data.

Programmatic changes and trends: Preparation of a nuclear database quantifying the production of therapeutic radioisotopes through a CRP will be finished in 2006–2007, but further studies are planned to accommodate other data requirements for radiotherapy. Data on tritium inventories in fusion devices and atomic and molecular for plasma modelling will end, but other important work on dust in tokamaks, and producing new data for the atomic and molecular database will be launched. All work on nuclear data for the Th–U fuel cycle will end in 2007, and efforts in 2008 will be re-directed to IFMIF issues (fusion materials interaction), along with the intention to generate nuclear data for advanced nuclear facilities. Studies involving nuclear data for reactor dosimetry will be maintained at previous levels.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. The subprogramme is coming under significant external pressure to create suitable databases for advanced nuclear fission reactors and fusion devices (ITER, IFMIF). Maintaining the 2007 budget levels prevents any adjustments in resources that would satisfy this demand.

1.4.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	2 532 953	2 533 073
Extrabudgetary	15 000	15 000
Unfunded	15 000	15 000

Projects

Title, duration and priority	Main outputs
1.4.1.1 Data services, data networks and user support ***Duration:*** Recurrent ***Priority:*** 1	Improved software based communications with users in Member States; establishment of new and improved atomic and nuclear databases; specialists trained in Member States.
1.4.1.2 Nuclear data standards and evaluation methods ***Duration:*** Recurrent ***Priority:*** 2	New standards databases and scientific publications.
1.4.1.3 Nuclear data for radiotherapy using radioisotopes and external radiation sources ***Duration:*** 2003–2011 ***Priority:*** 3	New nuclear databases and related scientific publications.
1.4.1.4 Atomic and molecular data for fusion experiments ***Duration:*** Recurrent ***Priority:*** 1	New atomic and molecular data products and scientific publications.
1.4.1.5 Nuclear data for reactor dosimetry and analysis ***Duration:*** 2005–2011 ***Priority:*** 3	New nuclear data products and scientific publications.
1.4.1.6 Nuclear data for advanced nuclear facilities ***Duration:*** 2005–2013 ***Priority:*** 2	New nuclear databases and scientific publications.

Subprogramme 1.4.2 Research Reactors

Rationale: Effective management and utilization of research reactors contribute to the continued advances in nuclear research and technology development. They must be safely and reliably operated, adequately utilized, refurbished when necessary, provided with adequate proliferation resistant fuel cycle services and safely decommissioned at the end of life. Among operating research reactors, up to 60% of which are over 30 years old, the priority issues in Member States are ageing core materials and the technology of ageing management.

The focus of the subprogramme has been gradually changing in line with the maturity of activities related to research reactors. The concentration is now on helping research reactor facilities in their strategic planning, to increase their use in more sustainable areas such as isotope production and materials modification, in the refurbishment and replacement of ageing equipment, in the management of increasing spent fuel inventories and in planning decommissioning, in place of the traditional support to research and training. In continuing this approach, regional and interregional thematic collaborations, networking and centres of excellence for enhanced utilization of research reactors will be initiated and supported.

The Agency has been carrying out activities in support of the RERTR programme. The support needed for evolutionary and innovative nuclear power reactors and fuel cycles, especially in connection with the increased interest in nuclear power, requires the role of research reactors; the subprogramme will promote international collaboration to assess projected needs for research reactors.

Objectives:

— To increase the capabilities of interested Member States to safely and reliably carry out scientific research and technology development at research reactors, conduct ageing management, decommissioning, refurbishment and modernization.

— To enhance the potential of interested Member States to plan new facilities when needed, to cope with research reactor fuel cycle issues and reduce proliferation risks by core and target conversion, and to repatriate fuel to the country of origin.

Outcomes	Performance Indicators
— Increased use of the Agency's guidance by Member States to address issues in: research reactor utilization; fuel cycle (including the use of advanced high density fuels); safety and non-proliferation (especially reduction in the number of reactors employing HEU); implementation of strategic plans; and construction of purpose designed facilities for new applications.	— Number of facilities planning utilization strategies and implementing new applications; number of reactors converting from HEU to LEU fuel and/or using advanced high density fuels; successful repatriation of fresh and spent fuel to the country of origin; number of facilities with improved spent fuel storage conditions.
— Increased use by Member States of Agency provided information to manage ageing and refurbishment of research reactor facilities and to plan and implement decommissioning.	— Number of facilities carrying out ageing management programmes, refurbishment or formulation and implementation of decommissioning plans.

Programmatic changes and trends: The subprogramme maintains the focus on the different facets of research reactors for their effective utilization and management. Following the recommendations of an Agency conference on research reactor utilization, safety, decommissioning, fuel and waste management, and to address increasingly important concerns, emphasis will be put on the support of Member States' work in the framework of the RERTR on core conversion from HEU to LEU, target conversion from HEU to LEU, the repatriation of research reactor fuels to the country of origin, and the global clean out of research reactor fissile material, including experimental or exotic fuels and sources.

Following the recommendations of the Standing Advisory Group on Nuclear Energy, regional and interregional thematic collaborations, networking and centres of excellence for enhanced utilization of research reactors will be initiated and supported. To address the issue of research reactor support for evolutionary and innovative nuclear power reactors and fuel cycles, the subprogramme will promote international collaboration to assess projected needs over the long term for research reactors on a global and regional basis. To support the scientific, educational and commercial demands being placed at present on research reactors, a new project on research reactor operation, maintenance, availability and reliability has been included.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. An optimal mix of available financial resources, i.e. regular budget and extrabudgetary, will be used to deliver the work programme.

1.4.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	976 135	976 468
Extrabudgetary	447 747	312 747
Unfunded	209 500	159 500

Projects

Title, duration and priority	Main outputs
1.4.2.1 Enhancement of utilization and applications of research reactors ***Duration:*** Recurrent ***Priority:*** 1	Publication on residual stress; update of the Research Reactor Data Base (RRDB); international conference on research reactors; report on materials testing and development; and a report on the strategies for networking for research reactor utilization.

Title, duration and priority	Main outputs
1.4.2.2 Supporting research reactor modernization and innovation ***Duration:*** 2005–2013 ***Priority:*** 1	Publications containing results of workshops.
1.4.2.3 Addressing research reactor fuel cycle issues ***Duration:*** 2005–2014 ***Priority:*** 1	Publications on: research reactor spent fuel inventories and their problems; shipments of research reactor fuel to its country of origin; interim CRP results; good practices for the management and storage of research reactor spent fuel; and conversion of research reactors from HEU to LEU.
1.4.2.4 Facilitating transfer of know-how on decommissioning of research reactors and irradiated core materials ***Duration:*** 2006–2011 ***Priority:*** 1	Publications on: decommissioning of research reactors under conditions of limited resources; use of samples from the cores of decommissioned or refurbished reactors to improve understanding of ageing irradiated core materials; and pool side inspection of research reactor fuel.
1.4.2.5 Research reactor operation, maintenance, availability and reliability ***Duration:*** 2006–2012 ***Priority:*** 1	Publications containing results of workshops and meetings.

Subprogramme 1.4.3 Accelerators and Nuclear Spectrometry for Materials Science and Analytical Applications

Rationale: Applications of particle accelerators cover a number of areas, from strategic and applied research, materials research and analytical sciences, to radioisotope production and radiation processing. Research and development using accelerators involves a broad spectrum of skills to build a cadre of trained experts in nuclear techniques in Member States, and to generate knowledge for innovative methodologies and tools. The coordinated research efforts under way on accelerator based techniques and pulsed neutron sources is expected to lead to new initiatives in materials research of relevance for both the nuclear and non-nuclear fields. Material science studies with the use of accelerators, neutron beams and other nuclear analytical methods are relevant to the development of advanced reactors, nuclear fuel cycle needs and fusion research. In this regard, a better understanding of the irradiation effects in materials for energy and non-energy applications is needed, and is reflected in a new project on accelerator techniques for modification and analysis of materials for nuclear technologies. The close interdivisional coordination envisaged in the area of ADSs, accelerated ageing studies on materials of interest for the nuclear energy programme, and in nuclear instrumentation for applications in agriculture, health and environment, will strengthen programme implementation. The accelerator related activities under this subprogramme will be focused on networking and collaborations to facilitate a range of interdisciplinary initiatives in order to develop applications as well as foster education and training through the use of accelerators. Training and the provision of technical information services to Member States in the area of applications of nuclear spectrometry for environmental studies, in particular for X ray fluorescence (XRF) laboratories, is a recurrent activity of continuing importance for several developing countries. Capacity building to meet equipment and instrumentation needs for the effective utilization of radiation related facilities will be supported.

Objective: Increased capabilities of Member States to adopt and benefit from the application of particle accelerators, nuclear spectrometry and related instrumentation in materials science and analytical services.	
Outcome	**Performance Indicator**
— Well functioning, sustainable infrastructure and facilities in Member States supporting applications of accelerators, nuclear spectrometry and instrumentation in priority development areas of nuclear science and material research.	— Number of publications/reports resulting from utilization of accelerators, nuclear spectrometry and instrumentation in Member States.

Programmatic changes and trends: Better understanding of irradiation effects on materials for energy and non-energy applications is strongly emphasized and is reflected in a new project on accelerator techniques for modification and analysis of materials for nuclear technologies. New, challenging applications in the use of accelerators and related instrumentation are envisaged. Mature nuclear analytical methods will be supported with respect to capacity building and basic nuclear knowledge education.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget.

1.4.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 644 618	2 644 696
Extrabudgetary	—	—
Unfunded	111 809	309 036

Projects

Title, duration and priority	Main outputs
1.4.3.1 Accelerator techniques for modification and analysis of materials for nuclear technologies ***Duration:*** 2007–2013 ***Priority:*** 1	Publications containing results of technical meetings and Conferences; reports of CRPs on accelerator techniques for materials analysis.
1.4.3.2 Fostering interdisciplinary developments in accelerator applications ***Duration:*** 2008–2012 ***Priority:*** 1	Publications containing results technical meetings; reports of CRPs on accelerator based research for nuclear applications.
1.4.3.3 Nuclear instrumentation for agriculture, health, environment and industrial applications ***Duration:*** Recurrent ***Priority:*** 2	Technical staff trained for operation, calibration and maintenance of nuclear instruments; CD-ROMs on distance learning tools; reports on quality assurance (QA) protocols and procedures and methods for maintenance and modernization of nuclear instruments; calibration laboratory for electric parameters; training facility for basic maintenance and QA of gamma cameras.
1.4.3.4 Nuclear spectrometry for analytical applications ***Duration:*** 2006–2013 ***Priority:*** 2	Publications on new developments and use of nuclear spectrometries, including XRF, and on integration of nuclear spectrometries for better characterization of materials; computer based modules for learning and teaching spectrometry; XRF Newsletter.

Subprogramme 1.4.4 Nuclear Fusion Research

Rationale: The world's total energy needs in the latter part of the 21st century and beyond cannot be met without recourse to a range of energy sources, including fusion energy. Nuclear fusion research has been achieving remarkable progress demonstrating its potential as a clean and lasting source of energy. However, several formidable challenges are still to be overcome, requiring extensive international cooperation. Two main lines of

thermonuclear fusion research are being actively pursued involving a significant R&D effort: inertial confinement; and magnetic confinement. The most visible achievement of fusion research efforts is the international cooperation project for construction of the International Thermonuclear Experimental Reactor (ITER), in Cadarache, France. Recent advances in plasma physics, in materials science and in fusion related technology have provided a solid basis for the construction of large facilities with the goal of achieving 'energetic status', where the output thermal energy produced by fusion exceeds the input energy. Examples of these are ITER and the MegaJoule projects in France, the Fast Ignition Realization Experiment (FIREX) project in Japan and the National Ignition Facility (NIF) project in the USA. These devices aim to establish the physics and technology and develop the materials necessary to build a fusion power plant. The Agency will continue to support worldwide fusion research activities and foster the exchange of scientific results among the different partners. It will provide a forum for knowledge sharing and dissemination through technical meetings, CRPs, the regular series of fusion energy conferences, Abdus Salam International Centre for Theoretical Physics (ICTP) schools on fusion and plasma physics and atomic and molecular data, and cooperation with ITER.

Objective: To strengthen cooperation and increased awareness amongst institutions and researchers of worldwide fusion energy endeavours.	
Outcome	**Performance Indicators**
— Increased collaboration and information exchange in the fusion community.	— Number of cost free participants in Agency sponsored meetings on fusion. — Number of participants in CRP''s and joint experiments.

Programmatic changes and trends: Planning for this subprogramme has incorporated advice given by the IFRC and suggestions by major international fusion organizations. Activities are envisaged to support developing Member States interested in being associated with mainstream fusion research to bolster the science and technology efforts necessary for building a fusion power plant. New technical resources such as databases need to be developed for better knowledge management and activity planning.

Resource changes and trends: The proposed 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. Participation of Member States in activities is often directly supported by institutes and experts willing to collaborate with the Agency.

1.4.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	564 452	564 484
Extrabudgetary	—	—
Unfunded	110 000	137 000

Projects

Title, duration and priority	Main outputs
1.4.4.1 Supporting plasma physics and fusion research ***Duration:*** 2004–2013 ***Priority:*** 1	Proceedings of the 22nd Fusion Energy Conference; publications containing the results of meetings and CRPs.
1.4.4.2 ITER support functions ***Duration:*** Recurrent ***Priority:*** 2	Reports to ITER parties disseminated; reports produced on ITER related activities.

Subprogramme 1.4.5 Support to the Abdus Salam International Centre for Theoretical Physics (ICTP)

Rationale: With the endorsement of the Agency's General Conference and Board of Governors, the Italian Government and the Agency signed in 1953 an agreement "concerning the establishment of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste". In 1970, UNESCO joined the Agency as a full partner in the management of ICTP and, as of 1 January 1996, the primary administrative responsibility for ICTP was transferred from the Agency to UNESCO. The aims of ICTP were and remain to: help in fostering advanced

studies and research in physical and mathematical sciences, especially in developing countries; provide an international forum for scientific contacts between scientists from all countries; and provide facilities to conduct original research to its visitors, associates and fellows, principally from developing countries.

From the three basic fields of high energy physics, mathematics and physics of condensed matter, the programme of ICTP has expanded to cover fields such as solid state physics, atomic and molecular physics, energy systems, nuclear physics and fission, plasma physics and nuclear fusion, medical physics, synchrotron radiation, physics of weather and climate and structure and non-linear dynamics of the earth. Several of these fields are of direct relevance to the Agency's programmes and many scientific events are organized by ICTP on behalf of and with the direct involvement of the Agency. These activities, which cover information exchange, research and training, have involved the participation of more than 4000 scientists per year from developing and developed countries.

In addition, ICTP implements the "Sandwich Training and Education Programme", through the Agency's Technical Cooperation Fund, whereby scientists from developing countries are offered three year fellowships at ICTP in order to prepare a doctoral thesis in one of the fields covered by the Agency's TC programme. The fellows can work with their supervisors at their home institute and a core supervisor at ICTP, strengthening the scientific capabilities of Member States and avoiding the brain drain that has affected so many developing countries.

Objective: To enhance the scientific capability of Member States, particularly developing countries, through training and exchange of knowledge between scientists from developing and developed countries in the nuclear field, as well as fields related to the applications of nuclear science and technology.	
Outcome	**Performance Indicators**
— Scientists from developing and developed Member States making use of knowledge obtained through their participation in the scientific programmes of ICTP.	— Number of scientists benefiting from ICTP programmes in fields related to the Agency programmes and using the information in their home institutions. — Number of publications and degrees awarded to scientists participating in ICTP scientific events.

Programmatic changes and trends: Yearly programme of activities will be approved, as foreseen in the Agreement between the Italian Government, UNESCO and the Agency, by the ICTP Steering Committee upon the recommendation of the Scientific Council. Topics for the workshops, conferences, seminars and training events will cover areas of interest to Agency Member States in nuclear science, nuclear energy, nuclear safety and nuclear applications. In addition, topics for research and studies intended to support the Agency's scientific and technical programmes and which will be carried out by ICTP scientists and associates, will be identified and implemented.

Resource changes and trends: The proposed 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. No increase is foreseen in the scientific events of relevance to the Agency's programmes which would be implemented by ICTP.

1.4.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 339 562	2 339 562
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
1.4.5.1 Support to ICTP ***Duration:*** Recurrent ***Priority:*** 1	Training material on topics covered by workshops and seminars; scientists from developing countries trained; publications in international journals of the results of the research and studies conducted.

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 12

	Project / Subprogramme / Programme	2008			2009		
		Regular Budget at 2008 prices	Extra-budgetary	CAURBs Unfunded	Regular Budget at 2008 prices	Extra-budgetary	CAURBs Unfunded
1.0.0.1	Overall Management, Coordination and Common Activities	901 233	-	-	901 229	-	-
		901 233	**-**	**-**	**901 229**	**-**	**-**
1.1.1.1	Engineering support for design, operation, maintenance, and plant life management for safe long term operation	992 543	30 790	-	989 116	30 790	-
1.1.1.2	Strengthening training and human resources	349 930	30 790	-	365 196	30 790	-
1.1.1.3	Support plant performance improvement by information exchange	271 257	-	-	264 054	-	-
	Subprogramme 1.1.1 - Integrated Support for Operating Nuclear Facilities	**1 613 730**	**61 580**	**-**	**1 618 366**	**61 580**	**-**
1.1.2.1	Preparations for adding nuclear power plants	390 732	30 790	-	390 732	30 790	-
1.1.2.2	Implementation and engineering support for new nuclear power plant projects	364 979	30 790	-	364 979	30 790	-
1.1.2.3	Utilization of advanced technologies for new nuclear power plant projects	162 259	30 790	-	162 259	30 790	-
	Subprogramme 1.1.2 - Support for Expansion of Nuclear Power Plants	**917 970**	**92 370**	**-**	**917 970**	**92 370**	**-**
1.1.3.1	Infrastructure support for Member States interested in nuclear power	276 906	37 162	85 000	270 037	37 162	87 000
1.1.3.2	Planning and support for Member States' first nuclear power project	171 883	37 162	48 000	168 087	37 162	53 000
1.1.3.3	Development of future nuclear infrastructure arrangements	96 845	-	-	102 821	-	-
	Subprogramme 1.1.3 - Infrastructure and Planning for the Introduction of Nuclear Power Programmes	**545 634**	**74 324**	**133 000**	**540 945**	**74 324**	**140 000**
1.1.4.1	Development of requirements and guidance for INSs	190 089	603 572	-	190 089	603 572	-
1.1.4.2	Coordination of international activities for INSs	193 239	645 097	-	193 239	831 097	-
	Subprogramme 1.1.4 - Coordination of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)	**383 328**	**1 248 669**	**-**	**383 328**	**1 434 669**	**-**
1.1.5.1	Technology advances in water cooled reactors for improvements in economics and safety	584 741	291 986	14 000	585 593	291 986	29 000
1.1.5.2	Technology advances in fast reactors and accelerator driven systems	413 573	84 000	23 000	421 208	108 000	120 000
1.1.5.3	Technology advances for gas cooled reactors (GCRs)	301 596	-	-	301 587	-	-
1.1.5.4	Common technologies and issues for small and medium sized reactors (SMRs)	400 303	60 000	16 000	386 613	30 000	52 000
	Subprogramme 1.1.5 - Technology Development for Advanced Reactor Lines	**1 700 213**	**435 986**	**53 000**	**1 695 001**	**429 986**	**201 000**
1.1.6.1	Support for demonstration of nuclear seawater desalination	243 640	-	15 000	251 656	-	15 000
1.1.6.2	Nuclear hydrogen production and other applications	250 998	20 000	-	248 251	20 000	-
	Subprogramme 1.1.6 - Support for Non-electric Applications of Nuclear Power	**494 638**	**20 000**	**15 000**	**499 907**	**20 000**	**15 000**
Programme 1.1 - Nuclear Power		**5 655 513**	**1 932 929**	**201 000**	**5 655 517**	**2 112 929**	**356 000**
1.2.1.1	Updating uranium resources, supply and demand and nuclear fuel cycle databases	493 298	-	-	567 768	-	-
1.2.1.2	Supporting good practices in uranium production	303 501	-	-	252 325	-	-
	Subprogramme 1.2.1 - Uranium Resources and Production and Databases for the Nuclear Fuel Cycle	**796 799**	**-**	**-**	**820 093**	**-**	**-**

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 12

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary	2009 CAURBs Unfunded
1.2.2.1	Supporting the sharing of experience in the development and use of fuel structural materials and water chemistry management in nuclear power plants	161 983	-	-	172 847	-	-
1.2.2.2	Promoting good fuel performance and operating practice for current fuel types in water cooled power reactors	192 694	-	31 500	186 830	-	51 500
1.2.2.3	Promoting best practices in fuel design and manufacturing	211 946	-	-	195 562	-	-
	Subprogramme 1.2.2 - Nuclear Power Reactor Fuel Engineering	**566 623**	**-**	**31 500**	**555 239**	**-**	**51 500**
1.2.3.1	Promoting strategies for spent fuel management	266 093	-	-	285 417	-	-
1.2.3.2	Providing technical guidance on good practices for long term management of spent fuel	288 111	-	-	234 784	-	-
	Subprogramme 1.2.3 - Management of Spent Fuel from Nuclear Power Reactors	**554 204**	**-**	**-**	**520 201**	**-**	**-**
1.2.4.1	Supporting nuclear fuels and fuel cycle activities of fast reactors, HTGRs and SMRs with long core life	358 290	-	75 751	378 716	-	108 751
1.2.4.2	Supporting fissile and fertile materials management and proliferation resistance	267 677	397 177	-	269 225	397 177	-
	Subprogramme 1.2.4 - Topical Issues of Nuclear Fuels and Fuel Cycles for Advanced and Innovative Reactors	**625 967**	**397 177**	**75 751**	**647 941**	**397 177**	**108 751**
	Programme 1.2 - Nuclear Fuel Cycle and Materials Technologies	**2 543 593**	**397 177**	**107 251**	**2 543 474**	**397 177**	**160 251**
1.3.1.1	Energy, electricity and nuclear power economics: Databanks on status and trends	449 009	-	-	449 009	-	-
1.3.1.2	Energy models and capacity building for sustainable energy development	1 095 374	-	-	1 095 375	-	-
	Subprogramme 1.3.1 - Energy Modelling, Data and Capacity Building	**1 544 383**	**-**	**-**	**1 544 384**	**-**	**-**
1.3.2.1	Technoeconomic analysis	680 191	-	-	680 192	-	-
1.3.2.2	Topical issues related to sustainable energy development	505 030	-	-	505 031	-	-
	Subprogramme 1.3.2 - Energy Economy Environment (3E) Analysis	**1 185 221**	**-**	**-**	**1 185 223**	**-**	**-**
1.3.3.1	Methodology and guidance for implementing nuclear knowledge management	514 934	-	-	510 456	-	-
1.3.3.2	Facilitating sustainable education and training in nuclear science and technology	518 337	-	-	564 424	-	-
1.3.3.3	Supporting knowledge maintenance, analysis and integration	790 534	-	-	780 314	-	-
	Subprogramme 1.3.3 - Nuclear Knowledge Management	**1 823 805**	**-**	**-**	**1 855 194**	**-**	**-**
1.3.4.1	INIS policy, planning, development and production	1 970 841	-	-	1 904 340	-	-
1.3.4.2	INIS products, services, outreach, capacity building and partnerships	974 984	-	-	1 010 384	-	-
	Subprogramme 1.3.4 - International Nuclear Information System (INIS)	**2 945 825**	**-**	**-**	**2 914 724**	**-**	**-**
1.3.5.1	Development and maintenance of the IAEA Library's information resources	1 512 540	-	-	1 512 540	-	-
1.3.5.2	Provision of library services and information support	1 266 953	-	-	1 266 953	-	-
	Subprogramme 1.3.5 - Library and Information Support	**2 779 493**	**-**	**-**	**2 779 493**	**-**	**-**

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 12

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary	2009 CAURBs Unfunded
Programme 1.3 - Capacity Building and Nuclear Knowledge Maintenance for Sustainable Energy Development		**10 278 727**	**-**	**-**	**10 279 018**	**-**	**-**
1.4.1.1	Data services, data networks and user support	1 141 732	-	-	1 113 880	-	-
1.4.1.2	Nuclear data standards and evaluation methods	111 838	-	-	114 876	-	-
1.4.1.3	Nuclear data for radiotherapy using radioisotopes and external radiation sources	160 801	-	-	168 007	-	-
1.4.1.4	Atomic and molecular data for fusion experiments	453 661	15 000	-	456 812	15 000	-
1.4.1.5	Nuclear data for reactor dosimetry and analysis	264 447	-	-	274 707	-	-
1.4.1.6	Nuclear data for advanced nuclear facilities	400 474	-	15 000	404 791	-	15 000
	Subprogramme 1.4.1 - Atomic and Nuclear Data	**2 532 953**	**15 000**	**15 000**	**2 533 073**	**15 000**	**15 000**
1.4.2.1	Enhancement of utilization and applications of research reactors	315 154	-	40 000	315 341	-	15 000
1.4.2.2	Supporting research reactor modernization and innovation	144 261	173 947	56 500	123 741	173 947	56 500
1.4.2.3	Addressing research reactor fuel cycle issues	300 247	273 800	-	315 783	138 800	-
1.4.2.4	Facilitating transfer of know-how on decommissioning of research reactors and irradiated core materials	99 233	-	56 500	109 493	-	31 500
1.4.2.5	Research reactor operation, maintenance, availability and reliability	117 240	-	56 500	112 110	-	56 500
	Subprogramme 1.4.2 - Research Reactors	**976 135**	**447 747**	**209 500**	**976 468**	**312 747**	**159 500**
1.4.3.1	Accelerator techniques for modification and analysis of materials for nuclear technologies	427 019	-	-	530 859	-	-
1.4.3.2	Fostering interdisciplinary developments in accelerator applications	440 263	-	69 000	393 096	-	104 000
1.4.3.3	Nuclear instrumentation for agriculture, health, environment and industrial applications	1 002 240	-	42 809	945 612	-	25 036
1.4.3.4	Nuclear spectrometry for analytical applications	775 096	-	-	775 129	-	180 000
	Subprogramme 1.4.3 - Accelerators and Nuclear Spectrometry for Materials Science and Analytical Applications	**2 644 618**	**-**	**111 809**	**2 644 696**	**-**	**309 036**
1.4.4.1	Supporting plasma physics and fusion research	457 185	-	110 000	457 217	-	137 000
1.4.4.2	ITER support functions	107 267	-	-	107 267	-	-
	Subprogramme 1.4.4 - Nuclear Fusion Research	**564 452**	**-**	**110 000**	**564 484**	**-**	**137 000**
1.4.5.1	Support to ICTP	2 339 562	-	-	2 339 562	-	-
	Subprogramme 1.4.5 - Support to ICTP	**2 339 562**	**-**	**-**	**2 339 562**	**-**	**-**
Programme 1.4 - Nuclear Science		**9 057 720**	**462 747**	**446 309**	**9 058 283**	**327 747**	**620 536**
Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science		**28 436 786**	**2 792 853**	**754 560**	**28 437 521**	**2 837 853**	**1 136 787**

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Core Activities Unfunded in the Regular Budget
Table 13

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
1.1.3.1	Infrastructure support for Member States interested in nuclear power		
1.1.3.1/01	*Develop documentation presenting the methodology for and provide implementation of infrastructure review series*	17 000	7 000
1.1.3.1/02	*Develop NE series documents to assess and assist planning of nuclear infrastructure*	17 000	7 000
1.1.3.1/03	*Support development of NE basic principles and objectives documents*	12 000	19 000
1.1.3.1/04	*Organize an International Ministerial Conference on the future application of nuclear power in 2009 (partly unfunded)*		30 000
1.1.3.1/05	*Develop a comprehensive report on international status and prospects of nuclear power*	39 000	24 000
1.1.3.2	Planning and support for Member States' first nuclear power project		
1.1.3.2/01	*Develop NE Series document related to the planning of the first nuclear power project*	48 000	53 000
	Subprogramme 1.1.3 - Infrastructure and Planning for the Introduction of Nuclear Power Programmes	133 000	140 000
1.1.5.1	Technology advances in water cooled reactors for improvements in economics and safety		
1.1.5.1/05	*Prepare an NE series document on HWRs status and projected development*	7 000	7 000
1.1.5.1/07	*Prepare an NE series document on best practices for HWR operational excellence*	-	15 000
1.1.5.1/09	*Prepare an NE series document on technology assessments for new plants for countries introducing additional plants*	7 000	7 000
1.1.5.2	Technology advances in fast reactors and accelerator driven systems		
1.1.5.2/01	*Organize an International Conference on Fast Reactors and Closed Fuel Cycle – Challenges and Opportunities in 2009 (partly unfunded)*	-	22 000
1.1.5.2/06	*Prepare an NE series document on fuel handling systems of sodium cooled fast reactors*	18 000	-
1.1.5.2/07	*Prepare an NE series document on in-service inspection and repair of sodium cooled fast reactors*	-	18 000
1.1.5.2/08	*Prepare an NE series document on advanced sodium heated steam generators and sodium/gas heat exchangers for fast reactors*	-	18 000
1.1.5.2/09	*Prepare an NE series document on negative feedback design features of sodium cooled fast reactors*	-	18 000
1.1.5.2/16	*Coordinate a CRP on "PHENIX End-of-Life Tests and Expertise" (new) (2009-2012)*	-	31 000
1.1.5.2/17	*Coordinate a CRP on development of advanced methodologies for substantiation of passive system performance in innovative reactors (new) (2008 - 2011)*	5 000	13 000
1.1.5.4	Common technologies and issues for small and medium sized reactors (SMRs)		
1.1.5.4/01	*Prepare an NE series document on objectives of design and technology development for innovative SMRs*	6 000	15 000
1.1.5.4/04	*Prepare an NE series document on options to enhance proliferation resistance and security of NPPs with innovative SMRs*	5 000	2 000
1.1.5.4/05	*Develop a 'living' database with structured design descriptions of 56 innovative SMRs*	5 000	5 000
1.1.5.4/06	*Prepare an NE series document on consideration of human factors in design optimization of innovative SMRs*	-	10 000
1.1.5.4/09	*Prepare an NE series document on development status and requirements to advanced computation methodologies using computation fluid dynamics for single- and two-phase coolant flow*	-	20 000
	Subprogramme 1.1.5 - Technology Development for Advanced Reactor Lines	53 000	201 000
1.1.6.1	Support for demonstration of nuclear seawater desalination		
1.1.6.1/10	*Hold a technical meeting on integrated nuclear desalination systems at KANUPP or KAERI in 2008 and 2009*	15 000	15 000
	Subprogramme 1.1.6 - Support for Non-electric Applications of Nuclear Power	15 000	15 000
Programme 1.1 - Nuclear Power		**201 000**	**356 000**
1.2.2.2	Promoting good fuel performance and operating practice for current fuel types in water cooled power reactors		
1.2.2.2/08	*Coordinate a CRP on improvement of computer codes used for fuel behaviour simulation FUMEX-III (2008–2012)*	31 500	51 500
	Subprogramme 1.2.2 - Nuclear Power Reactor Fuel Engineering	31 500	51 500

Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science

Core Activities Unfunded in the Regular Budget
Table 13

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
1.2.4.1	Supporting nuclear fuels and fuel cycle activities of fast reactors, HTGRs and SMRs with long core life		
1.2.4.1/11	*Coordinate a CRP on comparative assessments of the performance of various thorium-based fuel cycle concepts (2008-2011)*	26 500	59 500
1.2.4.1	*Temporary staff*	49 251	49 251
	Subprogramme 1.2.4 - Topical Issues of Nuclear Fuels and Fuel Cycles for Advanced and Innovative Reactors	75 751	108 751
Programme 1.2 - Nuclear Fuel Cycle and Materials Technologies		**107 251**	**160 251**
1.4.1.6	Nuclear data for advanced nuclear facilities		
1.4.1.6/05	*Extend FENDL (Fusion Evaluated Nuclear Data Library) general purpose file to 60 MeV neutron energy*	15 000	15 000
	Subprogramme 1.4.1 - Atomic and Nuclear Data	15 000	15 000
1.4.2.1	Enhancement of utilization and applications of research reactors		
1.4.2.1/11	*Organise TM on specific application of research reactors*	40 000	15 000
1.4.2.2	Supporting research reactor modernization and innovation		
1.4.2.2/04	*Coordinate a CRP on innovative methods in research reactor analysis (2008–2011)*	56 500	56 500
1.4.2.4	Facilitating transfer of know-how on decommissioning of research reactors and irradiated core materials		
1.4.2.4/05	*Coordinate a CRP on ageing of irradiated reactor core materials (2008–2011)*	56 500	31 500
1.4.2.5	Research reactor operation, maintenance, availability and reliability		
1.4.2.5/03	*Coordinate a CRP on on-line monitoring systems for research reactors (2008-2012)*	56 500	56 500
	Subprogramme 1.4.2 - Research Reactors	209 500	159 500
1.4.3.2	Fostering interdisciplinary developments in accelerator applications		
1.4.3.2/03	*Organize a TM on applications of synchrotron radiation in interdisciplinary research*	15 000	-
1.4.3.2/07	*Organize joint IAEA/ICTP workshop on accelerator related issues*	54 000	54 000
1.4.3.2/08	*Organize a training school on utilization of synchrotron X-rays and spallation neutrons*	-	50 000
1.4.3.3	Nuclear instrumentation for agriculture, health, environment and industrial applications		
1.4.3.3	*Lab related: equipment and a seminar on utilization of nuclear instrumentation*	42 809	25 036
1.4.3.4	Nuclear spectrometry for analytical applications		
1.4.3.4	*Lab related: scanning electron microscope and a technical meeting*	-	180 000
	Subprogramme 1.4.3 - Accelerators and Nuclear Spectrometry for Materials Science and Analytical Applications	111 809	309 036
1.4.4.1	Supporting plasma physics and fusion research		
1.4.4.1/04	*Coordinate a CRP on integrated approach to dense plasma applications in nuclear fusion technology (2008-2012)*	60 000	60 000
1.4.4.1/07	*Coordinate a CRP on joint research on small tokamaks*	-	27 000
1.4.4.1/09	*Organize nuclear education schools on plasma physics and fusion*	50 000	50 000
	Subprogramme 1.4.4 - Nuclear Fusion Research	110 000	137 000
Programme 1.4 - Nuclear Science		**446 309**	**620 536**
Major Programme 1 - Nuclear Power, Fuel Cycle and Nuclear Science		**754 560**	**1 136 787**

Major Programme 2
Nuclear Techniques for Development and Environmental Protection

Introduction

The major programme on Nuclear Techniques for Development and Environmental Protection continues to address priority areas identified by the World Summit on Sustainable Development (WSSD), held in Johannesburg, 2002, and those topics relevant to the work of the Agency that are contained in the United Nations Millennium Development Goals. Food and agriculture, human health, water resources, environmental management and industrial development are areas where nuclear and isotopic techniques, on their own or integrated with other technologies, are used to assist Member States in providing cost effective, and often unique, solutions.

The major programme continues to promote the interdependence of the constituent programmes and subprogrammes, ensuring that synergies between them are utilized for more effective and holistic approaches. For example, as in earlier programme cycles, agriculture is recognized as a major user of water, particularly in areas of shortage, and links will be made to the water resources programme for the promotion of water use efficiency. Radiopharmaceutical development and production will draw on inputs from the human health and radiation technology programmes; management of the marine and terrestrial environmental and aquatic environments are related to pollution control and to impacts on coastal zone issues, and understanding of climate change is linked to a better understanding of the water cycle. Opportunities are taken to develop cross-cutting projects and research in these and other areas, as appropriate.

The major programme particularly provides opportunities for developing Member States to participate in Coordinated Research Projects (CRPs) which, in addition to the benefits of the research, promote human capacity building and information exchanges on the use of nuclear and isotopic techniques in various fields. Such participation strengthens the capacities of national scientific and technical institutions and increases the use of internationally recognized procedures and standards for the application of nuclear techniques in national economies.

The Programme of Action for Cancer Therapy (PACT) is brought into Programme 2.2, Human Health as a subprogramme, with core funding provided for resources to implement projects using extrabudgetary funds. The main activities in PACT will be to focus on developing strategies for public–private partnerships, raising extrabudgetary resources and establishing model demonstration sites. Cooperation with WHO will be increased and partnerships with leading cancer control and treatment organizations strengthened.

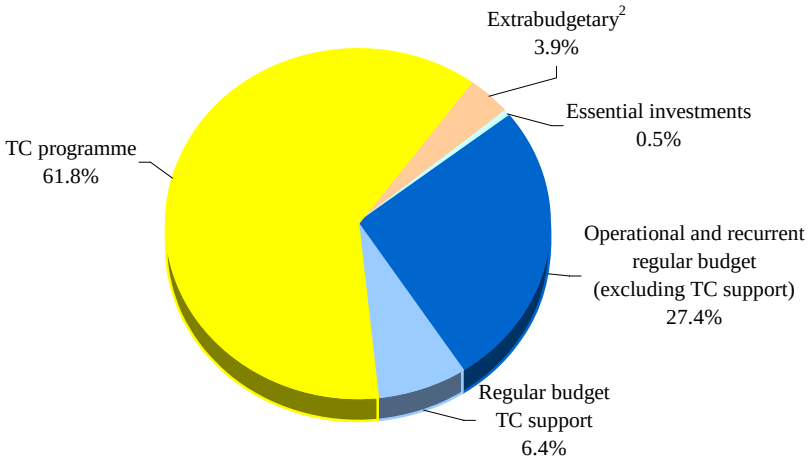
Cooperation with United Nations organizations, particularly FAO, IOC (UNESCO), UNEP, WHO and WMO, will continue and will be strengthened as opportunities allow. Support of and partnerships with other relevant and mandated bodies such as the African Union Pan African Tsetse and Trypanosomosis Eradication Campaign (AU-PATTEC) and the Programme Against African Trypanosomosis (PAAT) will continue. Increased collaboration with the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste will be pursued in areas of mutual interest. Collaboration with non-traditional partners will be sought where this will increase the effectiveness of the major programme.

Scientific and research support to the programmes will be provided by the Agency’s Laboratories at Seibersdorf (the Physics, Chemistry and Instrumentation Laboratory and the Agriculture and Biotechnology Laboratory), the Isotope Hydrology Laboratory in Vienna and the Marine Environment Laboratories in Monaco. The laboratories will increase their collaboration with each other through harmonizing work on reference materials for use in environment and trade.

Objective	Performance Indicators
— To enhance the capacity of Member States to meet basic human needs and to assess and manage the marine and terrestrial environments through the integration of nuclear and isotopic techniques, where they have comparative advantages, into sustainable development programmes.	— Extent of use by Member States of Agency recommended techniques and standards in agricultural production, maintenance of health, diagnosis and treatment of diseases, water resources management, industrial processing and environmental studies. — Extent of use by Member States of new or modified applications of radiation and isotope technologies. — Increase in the numbers of institutions/organizations in Member States that have a sustainable capacity to use radiation and isotope applications.

Outcome	Performance Indicator
— Increased use by Member States of nuclear and isotopic techniques for effecting improvements in food security, human health, water resources management, managing the marine and terrestrial environments and industrial development.	— Extent of use by Member States of Agency recommended techniques and standards in food production, health care, diagnosis and treatment of diseases, water resources management, industrial processing, and marine and terrestrial environmental studies.

2008–2009 Resources for Nuclear Techniques for Development and Environmental Protection[1]



Programmes	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Overall management, coordination and common activities	903 350	900 629	1 803 979
Food and Agriculture	12 199 485	12 202 453	24 401 938
Human Health	8 630 322	8 632 245	17 262 567
Water Resources	3 386 477	3 386 378	6 772 855
Environment	5 405 195	5 404 658	10 809 853
Radioisotope Production and Radiation Technology	1 969 056	1 969 020	3 938 076
Operational and recurrent regular budget	32 493 885	32 495 383	64 989 268
Essential investments	810 000	190 000	1 000 000
Total regular budget	**33 303 885**	**32 685 383**	**65 989 268**
Extrabudgetary	3 717 763	3 867 763	7 585 526
TC programme	59 211 800	59 831 400	119 043 200
Total resources	**96 233 448**	**96 384 546**	**192 617 994**

[1] Excludes unfunded activities of €4 892 434.
[2] Includes funds from other UN organizations.

2.0.0.1 Overall management, coordination and common activities

Description	Main outputs
Coordination and advisory activities within the major programme are necessary to ensure the linkages between the diverse programmes and subprogrammes are effective and efficient. Coordination on technical issues is necessary for the relevant activities in Major Programmes 1, 3 and 6 and for managerial issues in Major Programme 5. Coordination between programmes is also needed for preparation of the Nuclear Technology Review, the Annual Report, programme performance assessment, documents for the Board of Governors and General Conference, and for support to the Standing Advisory Group on Nuclear Applications (SAGNA). Coordination of programmes will ensure that advantage is taken of programme synergies to utilize resources efficiently and ensure that topics and issues are dealt with holistically. CRPs are managed to ensure that activities respond fully to Member State and programmatic needs and to the overall strategy of the Agency.	Preparation of the part for the Nuclear Technology Review relating to nuclear applications; coordination reports; advisory group reports; policy on coordinated research. Decisions and guidance relating to essential investments for activities in Major Programme 2.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 14.7% (€112 410) in 2008 as compared with 2007, and a decrease of 0.3% (€2 564) in 2009 as compared with 2008. The increase in 2008 and 2009 represent the transfer of funds to this area from Major Programme 2 programmes to supplement resources for essential investment equipment.

2.0.0.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	903 350	900 629
Extrabudgetary	—	—
Unfunded	—	—

Programme 2.1 Food and Agriculture

Rationale: The three global goals of the United Nations for sustainable food security are: (i) ensuring access for all people to sufficient, nutritionally adequate and safe food; (ii) the continued and sustainable contribution of agriculture to economic and social progress; and (iii) the conservation and sustainable utilization of natural resources, including land, water and the genetic resource base for food and agriculture. Three thematic areas identified for priority action and considered relevant to the mandate of both the Agency and FAO are: (a) productivity enhancement; (b) plant, animal and consumer protection; and (c) conservation and sustainable use of natural resources.

Agriculture continues to face serious challenges in the 21st century. A projected additional two billion people by the year 2030 will have to be fed from an increasingly fragile natural resource base, and the spread of emerging transboundary animal diseases and plant insect pests is a further challenge to human and animal health. Various constraints to agricultural development related to these thematic areas can be addressed effectively through nuclear techniques and biotechnology. Some of these techniques provide more precise and specific tools for characterizing and monitoring critical constraints and risks to farming systems in developing countries, including those that arise from the genetic make-up of the microorganisms, plants, animals and insects that comprise these systems. Others offer direct and highly effective means of reducing the risks to food chains by improving crop traits in ways that provide agronomic or other benefits. These nuclear techniques may also contribute to the early and rapid diagnosis and control of transboundary animal diseases and plant insect pests.

Nuclear techniques, combined with the application of modern biotechnology, are essential to better understand and manipulate the processes that underpin the production and transformation of biophysical resources into food and agricultural products while conserving and sustainably using natural resources and improving food quality and safety. The effective transfer of existing nuclear techniques to developing countries and the development of new and safe biotechnologies combined with nuclear techniques, can greatly enhance the prospects for sustainably improving agricultural productivity today and in the future.

In this context, the programme has now been structured into four subprogrammes dealing with crops, livestock, food safety and pest control. In addition, the programme responds to several General Conference resolutions specifically in the area of insect pest control — it strengthens activities in relation to the sterile insect technique (SIT) to reflect the increasing demand of Member States. The programme offers a mix of strategic and applied research, technical cooperation and decision support initiatives consistent with the Agency's Statute and FAO's Constitution and in support of their respective medium term strategies. Priorities are based on identified needs, comparative advantages, new challenges and opportunities for incorporating nuclear techniques to improve the technology mixes available for understanding, reducing or removing constraints or risks to food and agricultural production chains in developing countries.

Objective: To enhance capabilities within Member States for alleviating constraints to sustainable food security by the application of nuclear techniques.	
Outcomes	**Performance Indicators**
— Increased use of Agency recommended techniques, guidelines and information products in agricultural research and development programmes.	— Number of Member States using Agency recommended techniques, guidelines and products in their agricultural research and development programmes.
— Approval of Agency recommended norms and procedures by international organizations.	— The number of Agency recommended norms and procedures adopted or approved and promoted by international organizations.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Through reviews and assessment of past activities, it has been possible to identify new challenges that have emerged for which the application of nuclear techniques can provide assistance in finding solutions. The programme has a new focus on rapid response to emergency situations such as emerging diseases, and also a new focus on assessing the detrimental effects of veterinary drug residues and mycotoxins for improved food safety. In the past biennium, several technologies have come to fruition, and it has become possible to transfer these techniques to Member States. Efforts will be made to adopt a more holistic approach, with a strong focus on the integration of soil, plant, nutrient and water activities for the sustainable management of agricultural and food production systems and environmental protection. Greater emphasis will be placed on the sustainable use of natural resources, such as water and soil nutrients.

2.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	12 199 485	12 202 453
Extrabudgetary	2 222 267	2 222 267
Unfunded	813 000	1 232 000

Specific criteria for prioritization:

1. First priority is given to projects which make significant contributions through radiation or isotopes to the creation of new knowledge and technology options for improving the efficiency and safety of food and agricultural production supply chains, while conserving natural and genetic resources.
2. Second priority is given to projects addressing a food and agricultural challenge that is significant globally or regionally to maximize the sharing of benefits among Member States, including issues related to trade.
3. Third priority is given to projects assisting Member States to implement the outcomes of major UN or global conferences and the standards underpinning international agreements.

Subprogramme 2.1.1 Sustainable Intensification of Crop Production Systems

Rationale: In many countries the sustainability of efforts to achieve development goals through agriculture, particularly through intensification and diversification of cropping systems and increased international trade in crop products, is undermined by the lack of suitable plant genetic resources, by low yielding crops which are poorly adapted to harsh environments or produce low quality products, and by various forms of soil degradation. In addition, profound demographic and economic changes (e.g. spreading urbanization and the globalization of food systems) are redrawing both the map and the nutritional profile of hunger and malnutrition, rapidly transforming food systems and the scope and nature of nutritional challenges throughout the developing world.

Understanding the dynamics and identifying the causes of, as well as finding solutions to these constraints requires access to the appropriate diagnostic and monitoring tools and plant production enhancement technologies.

Nuclear techniques provide essential or value added information and technology for defining and alleviating constraints and for providing opportunities for intensifying and diversifying cropping systems and promoting the international trade of agro-products while conserving and using natural resources in a sustainable manner. These techniques include: (a) radioactive and stable isotopes and neutron moisture probes which measure the sources and rates of uptake and losses of major nutrients and water and the dynamics of critical processes within soils such as organic matter turnover and erosion; (b) mutation techniques; and (c) molecular marker techniques and supportive biotechnologies for widening the diversity of plant genetic resources and for the development of new varieties of food and industrial crops with improved yield, value added traits and tolerance to stresses.

Objective: To enhance Member State capabilities to ensure agricultural and environmental sustainability while intensifying and diversifying crop production systems by developing and deploying nuclear techniques that promote the conservation and sustainable use of soil, water and plant genetic resources as well as to increase the biodiversity and productivity of mutant germplasm.

Outcomes	Performance Indicators
— Improved fallout radionuclide methodologies to measure soil redistribution in the landscape and to assess the impact of soil conservation practices on soil loss and sedimentation.	— Number of national agricultural research systems (NARS) using fallout radionuclides to monitor soil loss and quality assured Cs-137, Pb-210 and Be-7 data from national and regional laboratories.
— Increased availability and exchange between Member States of advanced mutant lines with improved and diversified traits.	— Number of improved mutant lines of local crops with agronomic traits and quality characters.
— Increased capacity in Member States to conduct participatory breeding and extension activities in natural resource management and mutation assisted breeding using nuclear techniques and supportive biotechnologies.	— Number of Member State scientific publications related to these fields.
— Better strategies to improve crop water productivity and enhanced nutrient–water use efficiency in water limited environments.	— Number of NARS that have enhanced capacities to increase crop water productivity and water–nutrient use efficiency.
— Availability of food crop (cereal and legume) genotypes tolerant to low soil nitrogen and phosphorus status.	— Number of cereal and legume genotypes evaluated for high nitrogen and phosphorus use efficiency in low fertility soils using isotopic and related techniques.

Programmatic changes and trends: Changes in this subprogramme relate mainly to its increasing focus on the management of natural resources at a watershed/catchment level to enhance crop productivity and environmental sustainability. Agricultural impacts on soil and water resources and the increased competition amongst different sectors for water use emphasize the need for a holistic and integrated soil–water–plant management approach.

A project on Soil Management and Conservation for Sustainable Agriculture and Environment will address sustainable agriculture, conservation of soil and water resources and environmental protection. Two projects: Enhanced competitiveness of high yielding staple crops through improved nutritional and quality traits and Integrated technologies to enhance application and efficiency of mutation induction in crop breeding and genetic research refocus activities related to plant breeding and genetics on concerns related to micronutrient malnutrition, commercial sustainability and crop quality, in addition to food security, and on the promotion of mutation induction and supportive biotechnologies, including advanced molecular techniques.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 5.1% (€249 579) in 2008 as compared with 2007, and a decrease of 2.4% (€112 600) in 2009 as compared with 2008. Partnerships with external institutions and funding will be sought.

2.1.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	4 766 674	4 651 788
Extrabudgetary	772 906	752 906
Unfunded	203 000	627 000

Projects

Title, duration and priority	Main outputs
2.1.1.1 Soil management and conservation for sustainable agriculture and environment ***Duration:*** 2006–2013 ***Priority:*** 2	Quality assured data on long term and short term soil erosion/sedimentation rates using fallout radionuclides, N-15 natural abundance, O-18 and H-2 analyses; data on nutrient and water dynamics in conservation agriculture and in other agricultural ecosystems under rainfed and irrigated conditions; data on the effectiveness of soil conservation practices; publication in peer reviewed journal; bi-annual newsletter; 12 TC projects; training for fellows at Seibersdorf and at other institutions.
2.1.1.2 Technologies and practices for sustainable use and management of water in agriculture ***Duration:*** 2006–2013 ***Priority:*** 1	Guidelines on crop water productivity and methodologies to measure various sources, flow paths and losses of water through crops and soils; data on crop water productivity and water balance for irrigation systems and water saving technologies, crop water transpiration and soil evaporation strategies to improve crop production per unit water used; data inputs for pilot testing and validation of FAO crop water productivity model, simulation models and decision support systems for irrigation scheduling and design of cropping systems to reduce unproductive water losses and prevent land and water degradation; training for ten fellows at the Soil Science Unit, Seibersdorf, and other institutions each year; technical inputs to projects.
2.1.1.3 Increasing competitiveness and nutritional properties of high yielding crops ***Duration:*** 2008–2014 ***Priority:*** 2	Mutant germplasm for integration into breeding schemes, with enhanced quality, nutritional and commercial traits such as modified starch composition, enhanced micronutrient contents and other nutritional factors and/or decreased contents of antinutrients in crops; published guidelines on the production of stable mutants with enhanced yield, quality and nutritional value; training of Member State personnel.
2.1.1.4 Integrated technologies to enhance application and efficiency of mutation induction in crop breeding and genetic research ***Duration:*** 2008–2014 ***Priority:*** 1	Protocols and guidelines for enhancing the efficiency of mutation induction and genetic resources for crop breeding and genetic research; training for 40 scientists from Member States in the applications of mutation induction and molecular markers in plant breeding through two interregional training courses at Seibersdorf; characterized mutant genetic resources available for distribution.
2.1.1.5 Integrated soil–plant approaches to increase crop productivity in harsh environments ***Duration:*** Recurrent ***Priority:*** 2	Evaluation methods based on nuclear techniques (e.g. C-13 isotope discrimination) for crop genotypes with high water and nutrient use efficiency under water limiting conditions; improved mutants with tolerance to environmental stress combined with good fertigation practices to increase productivity of mutant varieties (e.g. yield); improved mutants with tolerance to environmental stress; two newsletters; technical inputs to TC projects; training for fellows at Seibersdorf and other institutions.

Subprogramme 2.1.2 Sustainable Intensification of Livestock Production Systems

Rationale: Systems of livestock production in developing countries are becoming progressively more intensified as producers and traders respond to the increasing demands from consumers within urbanized societies for milk, meat, other livestock products and animals. At the same time, government authorities and their institutions are having to address the risks accompanying this 'livestock revolution' and, in particular, the challenges of how to

increase productivity without degrading the feed and genetic resources upon which production depends, and of ensuring that diseases, particularly those of a transboundary and zoonotic nature and which impact on trade, veterinary and human health, are brought progressively under control or eradicated. To succeed, they need to be able to assess and manage both the risks and the opportunities arising from intensification and control emerging and re-emerging animal diseases to minimize adverse effects on farmers' livelihood. This, in turn, requires capacities to develop, adapt and foster the application of the appropriate production and protection enhancing technologies as well as sound and mutually supportive policies for their use at the national and regional levels. Increasingly, these must be consistent with internationally accepted standards and guidelines.

The activities included in this subprogramme involve a combination of strategic and applied research, targeted to help NARS, veterinary authorities, regulators and the international community. The techniques involved are advanced, involving substantial international harmonization of protocols, standards and policies, and therefore build coalitions within the international community involved in both trade and poverty alleviation aspects of livestock development (e.g. FAO, WHO, AU, PAAT, PATTEC, UNIDO). Also, SAGNA advised increased Agency support for the early and rapid diagnosis and control of transboundary animal diseases, and the continued high level of requests for animal disease projects are evidence of the substantial needs of Member States in this area.

Objective: To enhance Member State capabilities to sustainably intensify livestock production systems and to assess, control and manage risks from transboundary animal diseases (TADs) and those of zoonotic nature, by developing and applying nuclear and related techniques.	
Outcomes	**Performance Indicators**
— Increased use of Agency recommended locally available feed resources and appropriate reproductive management practices that improve livestock productivity in smallholder production systems.	— Number of livestock farms introducing changes in feeding and reproductive management.
— Increased use of quality management systems for managing risks from TADs.	— Number of Member States obtaining World Organization for Animal Health (OIE) recognition of freedom from rinderpest and other TADs, and number of veterinary laboratories having quality management systems in place and meeting international accreditation.
— Increased knowledge base to promote self-reliance in developing countries.	— Number of scientists from developing countries trained and their output in the scientific literature.

Programmatic changes and trends: Emphasis will be placed on the optimal use of local genetic resources and targeted and improved feeding programmes (appropriate nutritional intake to stimulate optimal performance), while controlling and preventing management related diseases. Recent advances in molecular biology now increase the potential of using methods for characterizing any genome, be it of the animal or its associated organisms (commensal or pathogenic), for a wide variety of applications in livestock production and health.

There is a programmatic shift from classical surveillance and diagnosis towards the early and rapid diagnosis of TADs, enabling Member States to respond to the risks posed by such events earlier and with greater effectiveness.

There will also be increased harmonization of approaches among mandated organizations, such as the Consultative Group on International Agricultural Research (CGIAR), FAO and WHO through PAAT, PATTEC and other forums and initiatives.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 10.5% (€210 190) in 2008 as compared with 2007, and a decrease of 2.4% (€53 000) in 2009 as compared with 2008. Partnerships with external institutions and funding will be sought.

2.1.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 273 503	2 219 134
Extrabudgetary	341 973	321 973
Unfunded	430 000	110 000

Projects

Title, duration and priority	Main outputs
2.1.2.1 Integrated management of animal nutrition, reproduction and health ***Duration:*** 2008–2014 ***Priority:*** 2	Publications on strategies for using an integrated approach for improving smallholder market oriented animal production; integrated computer database — Livestock Information Management Application — for recording and evaluating farm and production data; newsletters; technical inputs to national and regional TC projects on methods for evaluating and utilizing alternative feed resources, improving the efficiency and delivery of reproduction services and related management diseases.
2.1.2.2 Reducing risk from transboundary animal diseases (TADs) and those of zoonotic importance ***Duration:*** 2008–2014 ***Priority:*** 1	Publications, guidelines and standard operating procedures on nuclear and related technologies for the diagnosis of TADs and those of zoonotic nature; laboratory network using validated protocols and procedures established; quality management systems in Member State laboratories; harmonized protocols for identification and analysis of TADs to allow better global epidemiological understanding; technical inputs to TC projects; training for veterinary personnel at Seibersdorf.
2.1.2.3 Molecular technologies for improving productivity in smallholder livestock systems ***Duration:*** 2004–2010 ***Priority:*** 1	Tools and methodologies for characterization of animal genetic resources in Member States; monitoring and manipulation of methanogenic and fibre degrading microbes in ruminants; characterization of disease causing pathogens leading to better and confirmed diagnosis and control of livestock diseases; publications and technology transfer of methodologies to improve the efficiency of smallholder livestock systems; training for scientists in the relevant technologies for improving productivity of small holder livestock; technical inputs to TC projects.

Subprogramme 2.1.3 Improving Food and Environmental Safety

Rationale: Ensuring the safety and quality of foods and agricultural commodities is an essential national response to tackle the twin challenges of expanding urbanization and improved public health. Countries can increase their social and development objectives through greater access to international and domestic food commodity markets. This requires agricultural control systems that are designed to ensure food quality and safety throughout the food production chain. In parallel with these developments, legal instruments have been established at the international, national and local levels aimed at improving the environmental management of agricultural systems. These are intended to prevent or reduce environmental degradation through a combination of operations that ensure the efficient and safe use of agricultural production inputs, and have in place emergency action procedures to minimize the risk of pollution or contamination from accidents.

In addition to the continuing use of irradiation for sanitary purposes, Member States have increased their use of irradiation for phytosanitary applications, especially those applications related to quarantine measures. The role of the analytical laboratory in the application of good production practices throughout the food chain, as opposed to the more traditional end-product testing of products, is also being strengthened with a view towards ensuring food safety and reducing at their source hazards arising from chemical, microbiological and radionuclide contamination. These activities entail the development of analytical methods and procedures that enable governments to evaluate the impact of their application of good production practices, including in the identification and use of environmental indicators related to water and soil.

Collaborative efforts between UN organizations and other relevant governmental and non-governmental organizations through current and future joint activities is a critical aspect of these activities.

Emergency planning and response to nuclear emergencies and radiological events are also of growing importance in joint international activities, particularly in regard to liaison with FAO to define and implement agricultural countermeasures in response to such events.

Objective: To enhance Member State capabilities in the use of irradiation for sanitary and phytosanitary purposes and to improve food safety and quality, protection of the environment and international trade through the application of nuclear and related analytical techniques, and preparedness and response to nuclear emergencies.	
Outcomes	**Performance Indicators**
— Increased application of irradiation for sanitary and phytosanitary purposes.	— Number of country approvals for the use of irradiation for sanitary and phytosanitary applications. — Estimated volume of irradiated products traded.
— Enhanced cooperation and collaboration with other international organizations in the application of harmonized administrative arrangements and procedures related to emergency preparedness and response to nuclear or radiological events, including the application of appropriate agricultural countermeasures.	— Criteria established in response to emergency exercises on the basis of the Joint Radiation Emergency Management Plan of the International Organizations (JPlan) and the Cooperative Arrangements Between FAO and IAEA on Information Exchange and Technical Support in Relation to Food and Agriculture in the Case of a Nuclear or Radiological Emergency. — Number of Agency basic safety standards revised (in relation to food and agriculture).
— Use by laboratories in Member States of quality assurance (QA)/quality control (QC) procedures to control residues and contaminants in foods.	— Number of Member State laboratories applying QA and QC procedures related to residues and contaminants in foods. — Number of validated analytical methods and procedures for residues and contaminants in foods transferred to Member States.
— Use by Member States of integrated analytical approaches to monitor, control and comply with maximum limits for residues and contaminants in foods.	— Number of laboratories reporting residue and contaminant data showing an improving trend.

Programmatic changes and trends: A new focus in this subprogramme will be on collaboration with the International Plant Protection Convention (IPPC) secretariat in the completion of international standards on the application of irradiation for phytosanitary measures. This includes the continued maintenance of databases related to irradiation, including the International Database on Insect Disinfestation and Sterilization (IDIDAS).

Renewed emphasis will be directed towards the strengthening of inter-agency efforts towards emergency preparedness and response to nuclear and radiological emergencies affecting agriculture, including in the conduct of emergency exercises and in the revision of basic safety standards related to food and agriculture. There will be an increased focus on problems related to quality control and residues in food and the environment.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 5.6% (€96 437) in 2008 as compared with 2007, and an increase of 19.1% (€312 078) in 2009 as compared with 2008. Since activities related to veterinary drug residues were transferred from the Animal Production and Health subprogramme in 2004, there has been no increase in the resources for the Food and Environmental subprogramme to address these additional activities.

2.1.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 684 308	2 006 054
Extrabudgetary	633 052	693 052
Unfunded	30 000	70 000

Projects

Title, duration and priority	Main outputs
2.1.3.1 Irradiation and agricultural countermeasures for food safety and trade ***Duration:*** 2006–2009 ***Priority:*** 2	Single irradiation doses for specific insect groups through international standards established; databases on irradiation updated; establishment of Incident Command Systems (ICS) related to food and agriculture; guidelines and procedures for functioning of ICS; inputs to the revised Basic Safety Standards.
2.1.3.2 Integrated control of food and environmental hazards ***Duration:*** 2006–2012 ***Priority:*** 2	Trained personnel in sample preparation techniques for instrumental analysis and for the determination of residues/contaminants in foods; validated methods and procedures for food residues/contaminants; laboratory reports on residue/contaminant data.

Subprogramme 2.1.4 Sustainable control of major insect pests

Rationale: Insect pests threaten food security through losses caused to crops and livestock and by reduced opportunities for intensified and trade oriented production systems. These losses can be as high as 40%, but will increase if present trends towards globalization of international trade in agricultural commodities increase, resulting in the increasing movement of important invasive species. Consequently, insecticide use is still growing, and while these compounds are generally highly effective, their toxicity and lack of specificity coupled with residues in food and the environment raise public concerns. Insecticide residues can be a serious barrier to the development of trade in agricultural products. There is therefore a need to develop pest control interventions, which do not impair biodiversity and degrade the environment, but which can facilitate trade and decrease reliance on insecticides. SIT, when part of an area-wide integrated pest management (AW-IPM) approach, can be used for insect suppression, containment, and/or eradication. AW-IPM can be used to establish pest free areas and areas of low pest prevalence, thereby providing better options to address IPPC standards and technical barriers to trade and other phytosanitary issues covered by the WTO. In response to General Conference resolutions specifically in the area of insect pest control and the increasing demand of Member States for the application of SIT, this subprogramme has been re-established as a separate subprogramme. It addresses some major insect pest problems of agriculture, livestock and humans, but also the increasing problem of the spread and establishment of new exotic or invasive pests that represent a major threat to agriculture and the environment. Furthermore, this subprogramme responds to Member State needs to increase trade in agricultural commodities without having to achieve complete elimination of a pest population.

The focus of this subprogramme is on AW-IPM to suppress, contain or eradicate dipteran and lepidopteran primary pests. Through a series of inter-related strategies and activities, it coordinates strategic and applied research for the improvement of, and decision support for, planning and implementation of intervention programmes. Its remit encompasses, inter alia, the development of standards, manuals and guidelines on AW-IPM and the coordination of research on methods for insect mass rearing, sterilization and release. Increased attention will be focused on modern biotechnological methods to improve the effectiveness of AW-IPM programmes.

Objective: To increase Member State capacity in area-wide suppression, containment or eradication of key pests of crops and livestock by developing and integrating SIT with other methods.

Outcome	Performance Indicator
— Increased awareness and use by Member States of improved sterile insect and related techniques and decision support systems.	— Number of Member States using improved technologies, feasibility and decision support studies, guidelines and standard operating procedures (SOPs).

Programmatic changes and trends: There will be a shift in emphasis, particularly in the plant pest areas, from using sterile insects mainly for creating pest-free areas to involving AW-IPM systems for pest suppression, combined with post-harvest treatments and other measures. This shift can be seen in the termination of the project on improved procedures and capacities for risk assessment and management of major trade related insect pests of crops through the integration of the sterile insect technique (SIT) in control programmes. In order to facilitate the establishment of areas of low pest prevalence and systems approaches for trade, the subprogramme will increasingly be involved in providing support to the setting of international phytosanitary standards under the auspices of the IPPC secretariat in FAO. Recognizing the significance of moth pests in agriculture, the

subprogramme will devote increasing resources to these pests in the new biennium, with emphasis on codling moth and other invasive moth species.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 7.5% (€273 308) in 2008 as compared with 2007, and a further decrease of 4.3% (€145 500) in 2009 as compared with 2008.

2.1.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	3 475 000	3 325 477
Extrabudgetary	474 336	454 336
Unfunded	150 000	425 000

Projects

Title, duration and priority	Main outputs
2.1.4.1 SIT to control exotic insect plant pests of agriculture and the environment ***Duration:*** 2006–2014 ***Priority:*** 1	Cost–benefit analysis of codling moth eradication; video on cactus moth control: improved rearing methods for Anastrepha fraterculus and Bactrocera oleae; QC profile for Bactrocera dorsalis sexing strain; reports on radiation biology for Cryptophlebia leucotreta and Cactoblastis cactorum; draft technical and economic model to predict the minimum area for SIT; improved strains for SIT release, evaluation of transgenic fruit fly strains.
2.1.4.2 Area-wide suppression of native insect plant pests to reduce insecticide use and facilitate international trade ***Duration:*** 2008–2015 ***Priority:*** 2	Cost–benefit analysis for olive fly, Mediterranean fruit fly and codling moth; new and revised IPPC standards, technical support; Geographic Information System (GIS) manual for managers of operational SIT programmes; report on improved codling moth shipping procedures; guidelines for codling moth mass rearing and quality control; improved performance of sterile males; mating compatibility studies; manual on the use of stable isotopes; updated and expanded expert database of fruit fly workers; report on availability and economics of radiation sources for insect sterilization.
2.1.4.3 Strengthening capacities to use SIT in area-wide control of tsetse and screwworm populations ***Duration:*** 2006–2012 ***Priority:*** 1	GIS based planning tools and information; guidelines for baseline data collection sampling; SOPs for sex separation and blood processing; harmonized concept amongst key partners; improved QC protocols and strain and blood management; improved population genetic tools for tsetse and screwworm; understanding the role of pathogens and symbionts in tsetse; technical inputs to TC projects; training of tsetse and screwworm personnel at Seibersdorf and other institutions.

Programme 2.2 Human Health

Rationale: The development of public health care and medical services for the prevention and control of infectious and non-infectious diseases, and to combat malnutrition, have followed the improvement in economic conditions in Member States. Many of these significant developments are effectively addressed using nuclear techniques, for which the Agency has unique competence among United Nations organizations. The Agency emphasizes radiation medicine applications and nutrition, but also the use of nuclear techniques in the prevention and control of communicable diseases such as tuberculosis, malaria and HIV/AIDS. In addition, it plays an important role in all human health issues involving the inadvertent or deliberate administration of radiation for medical purposes.

Nuclear medicine imaging procedures with unsealed radioactive sources have become essential in managing the two major groups of non-infectious diseases, cardiovascular disease and cancer, which account for more than half of the deaths worldwide. Biomedical nuclear imaging has shown remarkable developments in the last five–ten years: Single photon emission computed tomography (SPECT) is an already established and widely recognized technique for assessing cardiovascular conditions; proton emission tomography (PET) has more recently been recognized as an excellent tool for the diagnosis of cancer and evaluation of various treatment

modalities, especially in combination with computed tomography (CT) diagnostic radiology procedures (PET/CT). These technologies are being increasingly implemented in many Member States.

Radiotherapy, one of the earliest applications of radiation, remains a major cost-effective modality available for cancer treatment and pain palliation, often in conjunction with diagnostic radiology and nuclear medicine imaging procedures for tumour localization. There are many clinical settings in oncology where palliative radiotherapy, which comprises up to 70% of the clinical cases in many Member States, can either prevent serious side-effects of the disease, or alleviate the existing symptoms produced by the primary tumour or its metastasis. Curative radiotherapy is another established treatment. Many new physical, biological and pharmaceutical tools have become available in recent years that promise to make radiotherapy safer and more effective, and these tools need to be tested in trials in Member States before the improvements seen with the use of particular tools are introduced as improved standard treatments. Fostering and maintaining a QA culture, which includes accurate dosimetry and imaging, patient protection, optimized clinical practice, etc., is of paramount importance to the success of the application of radiation medicine techniques.

The Programme of Action for Cancer Therapy has been established to introduce or improve access to radiation cancer treatment in developing countries in cooperation with national programmes for cancer control and in collaboration with WHO. Using extrabudgetary contributions to implement the programme, this initiative has been further enhanced by the IAEA Nobel Peace Prize Cancer and Nutrition Fund, which was created to use the Agency's share of the 2005 Nobel Peace Prize for capacity building in the priority areas of cancer control and childhood nutrition.

Malnutrition is a global health problem which prevents many countries from achieving the UN Millennium Development Goals. The current global situation, where 170 million children are underweight while more than a billion adults are overweight (a phenomenon termed "the double burden of malnutrition"), results in a very heavy burden on health systems. Undernutrition and communicable diseases are still prevalent in many countries. Infectious diseases such as HIV/AIDS, malaria and tuberculosis and undernutrition often overlap and individuals living in resource poor settings are thus caught in a vicious cycle. The relationship between undernutrition and morbidity is complex as illness often results in undernutrition, increasing susceptibility to disease.

Nuclear based molecular biology plays an effective role in the fight against tuberculosis, malaria and HIV/AIDS, closely supporting the implementation of the Millennium Development Goals. Being robust and sensitive, as well as cost effective, nuclear techniques in molecular biology are used to detect drug resistance to tuberculosis and malaria Plasmodium strains, and also to monitor mutation of the HIV virus to predict drug resistance in order to optimize treatment and care of HIV infected individuals. In the latter case, information on HIV resistance is of utmost importance for the design of vaccine programmes. A number of Member States have already the appropriate infrastructure for carrying out these techniques on a routine basis, while many still lack adequate trained personnel, equipment, reagents and basic infrastructure.

Objective: To enhance capabilities in Member States to address needs related to the prevention, diagnosis and treatment of health problems through the development and application of nuclear techniques within a framework of quality assurance.	
Outcomes	**Performance Indicators**
— Increased use of nuclear techniques in human health as a result of the support provided by the Agency.	— Number of institutions in Member States using nuclear techniques in human health or increase in the frequency of their use.
— Increased application of Agency standards of practice in health programmes.	— Number of institutions in Member States applying Agency standards of practice in health programmes.
— Implementation of QA procedures in health services based on nuclear techniques.	— Number of institutions in Member States implementing QA programmes in health activities based on nuclear techniques.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: The difficulty in making a realistic assessment of outcomes in human health points to the need to find quantifiable indicators, but it is very difficult to quantify the state of health or well-being of a population. The focus will be on the number of institutions adopting nuclear techniques in human health or increasing the frequency of their use as a result of the Agency's support. A major lesson identified was that Member States were frequently not in a position to implement corrective actions or obtain follow-up data on patients. Participants in CRPs will be requested to implement actions in this area prior to the extension of research contracts and agreements.

2.2	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	8 630 322	8 632 245
Extrabudgetary	796 454	946 454
Unfunded	892 258	914 176

Specific criteria for prioritization:

1. First priority is given to those projects related to supporting Member States in the implementation of basic nuclear techniques which are mature or are of a services type. This is the case with most clinical activities in common use and laboratory services for QA in radiation medicine.
2. Second priority is given to those projects that deal with establishing policies for hospital and laboratory activities and implementing emerging or advanced technologies in the various areas of radiation medicine in Member States.
3. Third priority is given to projects generally dedicated to enhancing or improving existing capacities in Member States in implementing advanced techniques, as a support to specific requests from Member States, or research and development in areas of importance.

Subprogramme 2.2.1 Nutrition and Infectious Disease Prevention and Control

Rationale: The central role of nutrition in development has recently been re-emphasized by the World Bank. The importance of investing in nutrition is highlighted by the growing international awareness that the magnitude of malnutrition as a global health problem will prevent many countries from achieving the Millennium Development Goals and evidence that there are solutions to malnutrition. The importance of nutrition activities supported by the Agency has recently been highlighted by the focus on nutrition in particular child nutrition, within the IAEA Nobel Peace Price Cancer and Nutrition Fund.

The urgent need for effective nutrition interventions is clearly indicated by the current global situation where on the one hand 170 million children are underweight and undernutrition is an important factor in more than half of all child deaths worldwide and, on the other hand, more than a billion adults are overweight. This phenomenon results in a very heavy burden on health systems in countries where treatment of diet related non-communicable diseases will be increasingly needed at the same time as undernutrition and communicable diseases are still prevalent.

The importance of development and monitoring of strategies to prevent and control infectious diseases in order to achieve Millennium Development Goal No. 6, “To combat HIV/AIDS, malaria and other diseases”, cannot be underestimated. The magnitude of the global burden of infectious diseases is reflected by the fact that about 40% of the world’s population live in areas where malaria is transmitted and more than 40 million people are HIV positive. To achieve the targets of reversing the spread of HIV/AIDS and malaria by 2015 is a major challenge which calls for urgent action.

The Agency is assisting Member States in their efforts to combat malnutrition and to prevent and control infectious diseases, in particular HIV/AIDS and malaria. In nutrition, it contributes technical expertise in the use of stable isotope techniques in the development and evaluation of nutrition interventions. In the area of infectious disease prevention and control, the Agency provides assistance to Member States in the use of nuclear techniques in malaria control by the development of SIT for malaria vectors, assessment of the influence of the human genetic polymorphism on treatment outcomes for malaria as well as by the application of nuclear techniques in molecular epidemiology and immunology to support HIV vaccine programmes and to monitor mutation of the HIV-virus to predict drug resistance. In nutritional toxicology, a combination of stable isotope techniques for nutritional status assessment is combined with nuclear techniques to evaluate exposure to toxic/potentially toxic elements.

In addition, within this subprogramme, activities related to the safe use of radiation to sterilize human tissue grafts and the health effects of ionizing radiation will also assist Member States. Tissue grafting relies on the use of sterilized bone, skin and other non-viable tissues to help in tissue restructuring or the healing of serious injuries and wounds. Radiation, to sterilize human tissue grafts, reduces the risk of infection and allows the establishment of safe medical facilities for tissue banking. Sterilization procedures are now becoming mature, and this programme provides support to TC projects to improve standardization, QC and access regarding radiosterilization and tissue banking facilities in Member States.

Despite the extensive knowledge of radiation effects, there remain important questions with regard to the human health effects of radiation. Monitoring health effects and investigating mechanisms of ionizing radiation in the

0–1 Sv (elevated environmental dose levels) and 1–10 Sv ranges (accidentally exposed individuals) is an important contribution to a better understanding of the effects of radiation. Knowledge of these effects for exposed individuals, and new treatments for them based on radiobiological mechanisms, have become more important following several different types of unplanned or potential exposure scenarios.

Objectives:

— To enhance Member State capability to combat malnutrition in all its forms and to prevent and control infectious diseases.

— To contribute to a better understanding of the health effects of ionizing radiation and to optimize the safe use of radiation to sterilize human tissue grafts.

Outcomes	Performance Indicators
— Implementation of effective strategies by Member States to combat malnutrition based on nuclear techniques.	— Number of Member States using nuclear techniques in the development, evaluation and implementation of strategies to combat malnutrition.
— Implementation of effective strategies by Member States to prevent and control infectious diseases using nuclear techniques.	— Number of Member States using nuclear techniques in the development, evaluation and implementation of strategies to prevent and control infectious diseases.
— Increased knowledge of the effects of low to medium radiation doses to the whole body, and improved methods for treating accidentally exposed people.	— Number of Member States using improved methods for treating individuals accidentally exposed to radiation.
— Improved standards and QC of irradiated tissue allografts by Member States.	— Number of institutions in Member States using Agency recommendations for irradiated tissue grafts.

Programmatic changes and trends: There will be a stronger emphasis on the Agency's contribution to Member State efforts to achieve the Millennium Development Goals and to combat malnutrition. In addition, an integrated approach to infectious disease prevention and control and a holistic approach to nutrition and health will be developed by including nutritional toxicology in the subprogramme.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 6.0% (€127 632) as compared with 2007, and a further increase of 2.1% (€47 475) in 2009 as compared with 2008. In line with the thematic approach already adopted in the previous biennium, activities on communicable disease prevention and control have been moved from Subprogramme 2.2.2. The increase is thus attributable to the initiation of a new project on nuclear techniques in the prevention and control of HIV/AIDS and other infectious diseases, which addresses the complex area of interactions between nutrition and infectious diseases.

2.2.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 316 233	2 364 907
Extrabudgetary	—	150 000
Unfunded	250 000	150 000

Projects

Title, duration and priority	Main outputs
2.2.1.1 Combating the double burden of malnutrition ***Duration:*** 2005–2011 ***Priority:*** 1	Guidelines and distance learning modules; reports and peer reviewed publications; input to the planning and implementation of national and regional TC projects.

Title, duration and priority	Main outputs
2.2.1.2 Sustainable strategies to combat micronutrient deficiencies ***Duration:*** 2004–2011 ***Priority:*** 1	Guidelines and distance learning modules; reports and peer reviewed publications; input to the planning and implementation of national and regional TC projects.
2.2.1.3 Nuclear techniques in the prevention and control of HIV/AIDS and other infectious diseases ***Duration:*** 2005–2012 ***Priority:*** 1	Guidelines and distance learning modules; reports and peer reviewed publications; input to the planning and implementation of national and regional TC projects.
2.2.1.4 Development of the SIT for the control of malaria transmitting mosquitoes ***Duration:*** 2005–2012 ***Priority:*** 3	Methodologies and guidelines for the production, sexing, handling and sterilization of An. arabiensis; publications and reports on the progress of CRPs; improved strains and radiation protocols; state of the art tools to evaluate mosquito fitness and population effects (semi-field systems); training of staff in Member States.
2.2.1.5 Health effects of environmental and other whole body irradiations ***Duration:*** 2005–2010 ***Priority:*** 3	Reports and articles in scientific journals.
2.2.1.6 Radiation sterilization to improve tissue banking ***Duration:*** 2005–2010 ***Priority:*** 2	Reports on tissue banking and radiosterilization, including revision of the Agency's safety standards relating to the use of radiation sterilized allograft tissues.

Subprogramme 2.2.2 Nuclear Medicine and Diagnostic Imaging

Rationale: The increasing costs of medical care make it essential that any decision on patient management is taken on the basis of sound evidence. This is even more true in developing countries, where shortage of resources require that treatment options are carefully evaluated and balanced. Imaging has therefore become important in managing the two major groups of non-infectious diseases, cardiovascular disease and cancer, which account for more than half of the causes of death worldwide. By 2010, cardiovascular disease is predicted to be the leading cause of death, according to WHO. In both areas, diagnostic imaging is increasingly playing a key role in disease management since it permits precise diagnoses, careful prognostic assessments and appropriate therapeutic decisions, as well as allowing the monitoring of treatment effects.

Within the realm of diagnostic imaging, nuclear medicine molecular imaging has the potential to enhance patient care and improve patient outcomes. Molecular imaging, a technique that targets and photographs biological markers, will one day allow physicians and scientists to detect characteristic molecular events in the human body specific for diseases, leading to the early diagnosis, treatment and even prevention of cancer and disorders of the heart, brain and endocrine system.

Nuclear medicine imaging devices have developed rapidly into sophisticated pieces of equipment. This has resulted in an enormous increase in their cost and in the need for maintaining quality. Also, there is a need to educate the nuclear medicine community about new imaging systems and procedures to keep them abreast with the current trends and applications. Quality management (QM) is fundamental for the safe and efficient practice of medicine. Setting standards and following the auditing cycle is a means to implement QM. Providing the correct framework and tools helps Member States raise their standard of health care delivery. Self appraisals, together with externally audited programmes, are also required for the successful implementation of QM. The scope of activity includes the preparation, compounding, QC, research and distribution of radiopharmaceuticals. Only a few Member States have the appropriate infrastructure for in-house preparation of radiopharmaceuticals for routine clinical applications; the vast majority still lack adequate human resources, knowledge and the appropriate equipment.

Radionuclide therapeutic procedures are effective treatment options when correctly applied. In most instances they are also cost effective. As in any medical specialty, the introduction of new therapeutic protocols using novel radiopharmaceuticals labelled with beta emitters requires specialized knowledge and skills to ensure their correct implementation. The availability to many Member States of therapeutic applications using unsealed radiopharmaceuticals is limited for various reasons, including cost. Only a few possess the appropriate infrastructure, equipment and personnel that would allow these procedures to be used on a routine and safe basis. The Agency continues to address the special needs of Member States by creating local and regional capacities for the production of clinically suitable, cost effective radioisotopes and radiopharmaceuticals to meet medical needs.

Emphasis will also be given to education, through the preparation and provision of teaching material, with the aim of improving nuclear medicine practices in developing Member States. The programme for 2008–2009 will focus on promoting R&D activities on the wider use of nuclear medicine techniques through workshops, training courses, manuals and syllabuses covering evolving trends in nuclear medicine in general and in nuclear cardiology in particular.

Objective: To enhance Member State capability to address important diseases such as cardiac disease and cancer by implementing new nuclear medicine practices and/or updating existing ones.	
Outcomes	**Performance Indicators**
— Enhanced diagnostic capabilities in major clinical conditions such as cardiovascular disease and cancer, by using Agency's standards/guidelines.	— Number of institutions in Member States starting new activities in nuclear cardiology and PET applications.
— Increased use by Member States of standards of clinical practice of nuclear medicine developed by the Agency.	— Number of institutes adopting Agency's documents and procedures related to QM.

Programmatic changes and trends: Emphasis will be given to cardiovascular disease diagnosis in order to provide guidance to Member States on the appropriate implementation of nuclear cardiology techniques in their health care schemes, in particular myocardial SPECT imaging. A new approach will deal with implementing QM in nuclear medicine as a fundamental step for a safe and efficient clinical practice. Guidance on implementing PET programmes, in Member States identifying this technology as a priority, will be strengthened.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 13.7% (€241 511) in 2008 as compared with 2007, and an increase of 1.1% (€17 199) in 2009 as compared with 2008. The decrease results from the redistribution of resources to Subprogramme 2.2.1 due to the restructuring of the project on communicable diseases, and to Project 2.2.3.4 for which a higher level of funding is required in 2008, while the increase in 2009 is mainly attributable to the higher level of funding for CRPs and publications aiming at helping Member States to implement nuclear medicine clinical practices.

2.2.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 570 478	1 588 181
Extrabudgetary	—	—
Unfunded	—	80 000

Projects

Title, duration and priority	Main outputs
2.2.2.1 Strengthening the use of nuclear medicine in the management of cardiovascular and coronary artery disease ***Duration:*** 2006–2010 ***Priority:*** 1	Publications and scientific papers from CRPs; training of physicians and technologists in myocardial SPECT imaging; inputs to the planning and implementation of TC projects on nuclear cardiology will be provided.

Title, duration and priority	Main outputs
2.2.2.2 Application of positron emission tomography (PET) and molecular in vitro techniques for cancer and cardiac diseases management ***Duration:*** 2006–2011 ***Priority:*** 1	Publications and scientific papers from CRPs; training of physicians, radiochemists and technologists in clinical imaging by means of PET and PET-CT; introduction of PET and PET-CT and new clinical protocols and procedures in Member States; technical support to TC projects related to PET clinical practices.
2.2.2.3 Nuclear medicine in non-communicable and communicable diseases including quality assurance of clinical practice ***Duration:*** 2007–2012 ***Priority:*** 3	Publications on the results of completed CRPs; draft recommendations on the use of molecular techniques; study protocol for lymphomas; inputs to the planning and implementation of TC projects on molecular biology and immunodiagnostics.
2.2.2.4 Cost effective radiopharmaceuticals: Clinical applications (complementary project to radioisotope production and radiation technology programme (2.5.1.3) ***Duration:*** 2006–2011 ***Priority:*** 2	Publications on the results of CRPs; standards of practice for galenical services and dispensing of radiopharmaceuticals; recommendations for radioisotope based solutions to specific clinical needs; syllabus for training of chemists and pharmacists involved in PET; support to the planning and implementation of TC projects on nuclear medicine QA; radiopharmacology and hospital radiopharmacy.

Subprogramme 2.2.3 Radiation Oncology and Cancer Treatment

Rationale: The incidence of cancer is increasing dramatically in developing Member States. It is estimated that between 2005 and 2025, approximately 100 million patients will require radiotherapy for cure or palliation, but with present capacity less than a quarter of them will have access to proper treatment. It is important to raise awareness of this growing crisis and provide the means for Member States to establish policy with regard to cost effective cancer therapy in the context of comprehensive national cancer control programmes. If improperly applied, however, radiotherapy can do more harm than good. Therefore, it is also very important to ensure quality. The projects in this subprogramme have been re-designed to cover the technical aspects of palliative treatments, curative treatments and developments in cancer radiotherapy. This new set of projects within the subprogramme, as well as the many activities in partnership with PACT and with other key organizations, e.g. WHO and the International Agency for Research on Cancer (IARC), also respond to SAGNA recommendations.

There are many clinical settings in oncology where palliative radiotherapy can either prevent serious signs and symptoms of the disease or alleviate the existing symptoms produced by the primary tumour or its metastasis. Curative radiotherapy is an established treatment, but there are special considerations in some Member States with regard to guidelines for good practice, and the need for validated economical protocols for many common cancer types. Many new physical, biological and pharmaceutical tools have become available in recent years that promise to make radiotherapy safer and more effective. Unbiased evaluation of their current role and future potential is required before incorporation into routine practice. Imaging of the cancer (e.g. by CT scanning and PET scanning) is a crucial component of accurate radiotherapy. Therefore, studies will be initiated and tools developed for strengthening the capabilities of Member State institutions in image based radiotherapy. Continuing professional development of health care professionals in radiotherapy will be emphasized so that they may use the newer tools appropriately for the benefit of patients.

To increase the Agency's capacity for assisting Member States in providing appropriate cancer treatment, guides to essential practice are needed for many of the common cancers, teaching syllabuses and distance learning material for radiotherapy and associated professionals are required, and research projects are needed to evaluate economical protocols modifications of radiotherapy. The guides and syllabuses/distance learning material will be produced, and research projects undertaken and some of these are expected to be strengthened with PACT extrabudgetary resources.

The maintenance and improvement of the Directory of Radiotherapy Centres (DIRAC) database will continue with the provision of accurate data brought by technical officers from their visits to radiotherapy centres. In addition, participation in the newly started project, the European Union Network for Information on Cancer, will provide an additional opportunity to update this database.

Objective: To enhance Member State capabilities to establish sound policies concerning radiotherapy and cancer treatment, and ensuring the effective and efficient utilization of current and future advanced cancer radiotherapy treatment technologies.

Outcome	Performance Indicators
— Increased and optimized use of radiotherapy techniques for treating cancer patients in Member States, including more trained professionals.	— Number of institutions in Member States using Agency guidance for the palliative, curative or advanced treatment of patients with the most common cancers, or benign diseases. — Number of institutions in Member Sates with qualified health care professionals trained in clinical QA in radiotherapy using methodologies based on Agency standards.

Programmatic changes and trends: This subprogramme is modified to provide technical support in the field of radiotherapy, i.e. for palliative, curative and advanced treatments in coordination with Subprogramme 2.2.5 (PACT). Palliative treatments are being emphasized more for this cycle, as they are the most common in developing countries. Curative treatments will be tailored to the needs of Member States for treatment of their most frequent types of cancer. In addition, high technology radiotherapy activities will be analysed for their possible implementation in the future in Member States. A small additional component of the work will be concerned with benign diseases. Subject to the availability of additional financial and human resources, guidelines and teaching material, including distance learning material, for radiation oncology programmes and management of common cancers in developing countries will be developed.

Resource changes and trends: The proposed resources for 2008 reflect an increase of 1.3% (€21 699) compared with 2007, and a decrease of 3.7% (€64 737) in 2009 over 2008. The increase in 2008 reflects the expansion of activities in the area of palliative radiotherapy, which accounts for 70% of cancer treatments in developing countries. The decrease in 2009 results from the expected completion of some activities in 2008 and a reduced level of funding requirements for meetings. The changes are balanced by the budget of Subprogrammes 2.2.1 and 2.2.2 due to cross-cutting projects/activities. Some activities originally planned to provide further support to PACT and the TC programme have been shifted to CAURBS, such as the development of guidelines for radiation oncology programmes and management of common cancers in developing countries, and teaching material, including distance learning material.

2.2.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 783 586	1 717 281
Extrabudgetary	—	—
Unfunded	202 258	204 176

Projects

Title, duration and priority	Main outputs
2.2.3.1 Palliative cancer management using radiotherapy ***Duration:*** 2007–2014 ***Priority:*** 1	Reports and scientific publications from the results of CRPs developing economical approaches to palliative treatment using radiotherapy; guidelines for the use of radiotherapy in common palliative clinical situations, and for implementing evidence based resource, economical radiotherapy strategies in common clinical situations; guidelines on the role of radiotherapy in benign conditions, e.g. for treating keloids, heterotopic ossification, desmoid tumours, refractory exophthalmus, muscular and joint diseases, and others.

Title, duration and priority	Main outputs
2.2.3.2 Curative cancer management using radiotherapy ***Duration:*** 2003–2015 ***Priority:*** 1	Reports and scientific publications from the results of CRPs on radiotherapy for site specific cancers, e.g. head and neck, gastrointestinal, and genitourinary cancers; publications on clinical meetings; guidelines for the treatment of common cancers in limited resource settings, e.g. gastrointestinal, genitourinary, and brain tumours.
2.2.3.3 Advanced techniques for cancer radiotherapy ***Duration:*** 2006–2012 ***Priority:*** 3	Published results of new CRPs in clinical and applied radiobiological topics; publications on evaluations of new technologies.
2.2.3.4 Therapeutic applications of unsealed radioactive sources in the management of benign and malignant diseases ***Duration:*** 2007–2010 ***Priority:*** 2	Guidelines on clinically relevant and effective therapeutic applications of unsealed radioisotopes for the treatment of benign and malignant conditions; national and regional training courses to promote therapeutic procedures; publications resulting from meetings, review processes and CRP activities.

Subprogramme 2.2.4 Quality Assurance and Metrology in Radiation Medicine

Rationale: In order to use radiation medicine for the safe and effective diagnosis and treatment of patients, hospitals and other medical institutions require QA systems and proper measurements of ionizing radiation. The subprogramme deals with the establishment in Member States of these QA systems, and with the transfer and exchange of knowledge involved in dosimetry and medical radiation physics.

Nuclear applications in radiation oncology, diagnostic radiology and nuclear medicine, and in radiation protection require the accurate measurement of radiation dose. The subprogramme supports the activities of Member States in these areas by ensuring international consistency in physical standards for dosimetry and by monitoring the implementation and dissemination of those standards to end-users. The Agency participates with the international metrology community as a signatory of the Mutual Recognition Arrangement, which establishes the formal framework providing Member States with radiation measurement technology such that their dosimetry measurements are linked to the international measurement system. The calibration of radiation measurement standards for Secondary Standards Dosimetry Laboratories (SSDLs) provides the only independent method for Member States that are not signatories of the Metre Convention to establish this link to the International System of Units (SI). Dosimetry verification services are also provided in regular dosimetry comparisons and audits both for SSDLs and for the end-user institutions engaged in radiotherapy, diagnostic radiology and radiation protection.

The subprogramme monitors the availability of technology, equipment and human resources for the provision of radiotherapy worldwide by contributing to the maintenance of the DIRAC database, and increases scientific and technical capacity in medical radiation physics by fostering R&D and playing a role in the education of medical physicists and other health care workers who deal with ionizing radiation. It assists Member States in preparing their infrastructure and adopting the procedures necessary to enable them to acquire advanced technology for treatment planning and delivery, such as intensity modulated radiotherapy and image guided radiotherapy (IGRT).

Objective: To enhance the capability of Member States to diagnose and treat patients safely and effectively by transferring technology in dosimetry and medical radiation physics through the establishment of a QA culture; and in radiation protection through the use of calibrated standards for accurate and traceable dose records.

Outcomes	Performance Indicators
— Enhanced QA and dosimetry in hospitals of Member States through a dose auditing and verification service.	— Number of facilities in Member States that have dosimetry calibrations for radiotherapy applications audited, verified and any discrepancies corrected.

Outcomes	Performance Indicators
— Increased competence in QA in dosimetry in the IAEA/WHO Network of SSDLs due to the availability of calibrated radiation measurement standards.	— Number of facilities in Member States that use the Agency's calibration services for national measurement standards and/or participate in the Agency's dosimetry comparisons.
— Increased use by Member States of Agency technology for dosimetry and medical radiation physics and for establishing QA systems to optimize patient diagnosis and treatment.	— Number of Member State institutions using Agency QA procedures and dosimetry codes of practice, and following Agency guidelines for medical physics in nuclear medicine, diagnostic radiology and radiation treatment.

Programmatic changes and trends: A new project in medical radiation imaging will combine new initiatives in imaging quality with existing medical physics activities in diagnostic radiology and nuclear medicine to strengthen the technology transfer and QA in medical physics pertinent to these technologies.

To improve the quality of radiation treatments in Member States, a concept called the Quality Assurance Team in Radiation Oncology (QUATRO) was introduced. Moving from its pilot stage to implementation, comprehensive peer review missions will be offered to institutions to assist them to identify gaps in their technologies and procedures, to strengthen their rationale for seeking specific technologies and to establish a baseline to judge the impact of subsequent technology transfer.

There will be an increased effort to assist Member States in educating more medical physicists and to provide them with the methodologies to promote the use of nuclear technology safely and effectively. In particular, guidelines on radiotherapy dose calculations and the suitability of equipment in resource limited settings will be produced. Member State participation in the DIRAC database will be enhanced.

Due to expansion of the laboratory facilities, an increased level of calibration services will be made available in radiation therapy, diagnostic radiology and radiation protection, and of dosimetry auditing services at the end user level.

The measurement of radioactivity standards for use of medical applications will be provided by outsourcing tasks to primary laboratories, using external experts and purchasing commercially available radioactive standards in support of CRPs or TC projects on radioactivity standardization.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 2.7% (€63 234) as compared with 2007, and an increase of 0.1% (€1 650) in 2009 as compared with 2008.

2.2.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 342 803	2 344 648
Extrabudgetary	—	—
Unfunded	—	40 000

Projects

Title, duration and priority	Main outputs
2.2.4.1 Quality audits in dosimetry for radiation medicine ***Duration:*** Recurrent ***Priority:*** 1	IAEA/WHO Thermoluminescent Dosimetry (TLD) postal dose quality audit service in radiotherapy; resolution of any discrepancies in beam calibration uncovered during dosimetry auditing; updated computerized International Dose External Audits database.

Title, duration and priority	Main outputs
2.2.4.2 Radiation metrology supporting the network of secondary standards dosimetry laboratories ***Duration:*** Recurrent ***Priority:*** 1	Agency certificates of calibration for radiation measurement equipment; Agency certificates of comparison and verification services; SSDL Newsletter (including its web version); updated database on the activities of the SSDL network; reports of comparisons of radiation measurement standards conducted with international metrology organizations.
2.2.4.3 Quality assurance and guidelines for medical physics in the optimization of clinical radiation imaging ***Duration:*** 2005–2012 ***Priority:*** 2	Publications on methodologies for improving medical radiation imaging, testing the implementation of the new dosimetry code of practice, and auditing procedures for diagnostic radiology; training material for education programmes in clinical medical radiation physics applied to radiation imaging and associated patient dosimetry; joint organization of a conference on radiation protection of patients in 2009; revision of the Basic Safety Standards in collaboration with Programme 3.3.
2.2.4.4 Quality assurance and medical physics developments in radiotherapy and therapeutic nuclear medicine ***Duration:*** 2007–2012 ***Priority:*** 3	Reports on radiation therapy in resource limited settings and on physical and biological tools used in treatment planning; peer review methodology (QUATRO) to identify gaps in technology and practices; update DIRAC; guidelines and training material for medical physicists.

Subprogramme 2.2.5 Programme of Action for Cancer Therapy (PACT)

Rationale: Cancer is a leading cause of death globally. The WHO estimates that 7.6 million people died of cancer in 2005 and 84 million people will die in the next 10 years if action is not taken. More than 70% of all cancer deaths occur in low and middle income countries, where resources available for prevention, diagnosis and treatment of cancer are limited or non-existent. There is much scope for action. Over 40% of all cancers can be prevented and some of the most common ones — including cervical, breast, head and neck, and colorectal cancers — are curable if detected early. For all patients with advanced cancer, the quality of life can be improved substantially by palliative care. Radiotherapy is a valuable component of treatment and palliative care for over 60% of cancer patients in developing countries. Many countries in Africa, Asia and Latin America have no national cancer control programmes or resources to tackle effectively the evident increase in the incidences of cancers in the next decades.

PACT was created by the Agency in 2004 to enable low and middle income countries to introduce or expand their existing infrastructure and capacity in radiotherapy in a sustainable manner, and to improve or accelerate access to effective radiotherapy services as an essential part of multidisciplinary cancer care. This goal cannot be achieved without mobilizing significant new resources. Nor can it be realized without partnership with other key organizations or in isolation from planning for and investments in other components that comprise a comprehensive and integrated national cancer control system. It also addresses other challenges such as infrastructure gaps and builds capacity and long term support for continuous education and training of cancer care professionals, as well as for community based civil society action to combat cancer. PACT has already succeeded in encouraging the formation of concrete alliances with key multi-sector organizations involved in cancer control, each maintaining its leadership in the cancer care components for which it has a mandate and experience. Such alliances and innovative public–private partnerships are essential in placing cancer on the global health agenda and comprehensively addressing cancer needs in the developing world over the next 10–20 years.

PACT will seek to build upon existing collaborations, which in 2007 include WHO, IARC, International Network for Cancer Treatment and Research, the International Union against Cancer, the American Cancer Society, Oxford University, the US National Cancer Institute, Tata Memorial Centre, the Open Society Institute (OSI), and private companies. PACT will also seek to expand opportunities for further non-traditional donors. The programme will be implemented in overlapping stages which are expected to raise awareness about cancer, assess cancer care capacity needs, develop demonstration projects and attract donors to establish effective new funding mechanisms beyond those currently available from the Agency. To advance this and the objectives described below, PACT will implement four projects which are in line with General Conference resolutions GC(48)/RES/13, GC(49)/RES/12 and GC(50)/RES/13.

Objective: To enable Member States to introduce, expand, and improve their cancer care capacity by integrating radiotherapy into a comprehensive cancer control programme that maximizes its therapeutic effectiveness and public health impact.	
Outcomes	**Performance Indicators**
— Functioning and self-sustaining comprehensive cancer care systems in developing Member States.	— Number of PACT Model Demonstration Sites (MDSs) established and numbers of partner organizations involved in their development.
— Cancer control training networks producing trained staff and training material.	— Number of cancer control training networks in operation.
— Cancer control strategies governing national policies for cancer management and treatment.	— Number of national cancer control strategies and associated action plans in operation.
— Securing of significant funding from non-traditional sources for combined implementation of comprehensive cancer control in the MDSs.	— Number of non-traditional donors providing significant funding resources.

Resource changes and trends: The proposed 2008–2009 regular budget resource requirements are based on estimates of the resources needed to implement this subprogramme.

2.2.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	617 222	617 228
Extrabudgetary	796 454	796 454
Unfunded	440 000	440 000

Projects

Title, duration and priority	Main outputs
2.2.5.1 Developing tools and fielding review missions upon request to assess Member States needs for cancer control planning (imPACT missions) ***Duration:*** Recurrent ***Priority:*** 1	Updated terms of reference for imPACT reviews; imPACT Country Case Study template to identify current cancer needs and control strategies.
2.2.5.2 Establishing, coordinating and evaluating PACT Model Demonstration Sites ***Duration:*** Recurrent ***Priority:*** 1	Operational PACT MDSs running comprehensive cancer control programmes; deployment of funds from non-traditional donors.
2.2.5.3 Developing strategies for public-private partnerships and fundraising for low resource countries ***Duration:*** Recurrent ***Priority:*** 1	Joint funding proposals for each PACT MDS attracting significant donor funds; partnerships and relationships with donors, financial institutions and relevant industry.
2.2.5.4 Developing regional cancer training networks ***Duration:*** Recurrent ***Priority:*** 1	Regional cancer control training networks established to increase the numbers of professionals trained locally or regionally in cancer care; inventories of existing cancer control training programmes and their qualitative and quantitative training capacities in low and middle income countries; lists of mentor centres for a regional training network; lists of upgrades and or investments needed at each centre; 'Virtual Cancer Control University' at the regional level; Cancer Control International Mentorship Network.

Programme 2.3 Water Resources

Rationale: Ministers responsible for water resources from more than 90 countries meeting at the 4th World Water Forum in Mexico City, Mexico, in March 2006 re-affirmed their commitment to "achieve the internationally agreed goals on integrated water resources management (IWRM), access to safe drinking water and basic sanitation, agreed upon in Agenda 21, the Millennium Declaration and the Johannesburg Plan of Implementation (JPOI)."

The world's population is estimated to grow to eight billion by 2030, with more than half living in urban settlements. The water demands of urban areas and ensuring food security to an increasing population place severe constraints on the ability of governments to fully support sustainable resource management and socioeconomic development. In addition, global climate change is expected to have variable impacts on regional climate and on the distribution and availability of water resources. It is important to understand these impacts and to develop appropriate capacity and policies for adaptation.

The integrated use of isotopes and other complementary techniques has become a widely used approach to address many aspects related to the sustainable management of water resources. Isotope techniques can play a crucial role in hydrogeological assessments of catchment basins and/or aquifers worldwide. For example, in Bangladesh, a World Bank–IAEA partnership resulted in the scientifically sound and cost effective mapping of aquifers to develop alternative sources of drinking water in arsenic contaminated areas.

The Water Resources Programme assists Member States in assessing and managing their water resources with isotope hydrology as an integral part of its scientific and institutional strength. Major activities are focused on isotope monitoring networks for use in hydrology, the development and dissemination of global data products, improved or easily accessible analytical facilities for Member States, and effective use of isotope techniques for solving Member State needs in water resources management. Programme scope and implementation strategy are being coordinated with other national and international organizations active in the water sector, as well as with related programmes of the Agency, such as the Marine Environment, Food and Agriculture and Technical Cooperation programmes. In particular, collaborative programmes with funding agencies such as the World Bank and the Global Environment Facility (GEF) have been expanded and are expected to be even stronger in the current cycle. The Agency's continued involvement in extending the use of isotope hydrology has been duly recognized by Member States through a number of General Conference resolutions, the most recent being GC(49)/RES/12. In addition, substantial Member State interest in the programme is indicated by a substantial and increasing number of requests for technical assistance.

Objective: To enable Member States to sustainably use and manage their water resources through the use of isotope technology.

Outcome	Performance Indicator
— Sustainable water resources management and related policy development in Member State based on sound scientific information.	— Extent to which Agency supported activities make available isotope methodologies and global isotope data that are used for watershed and groundwater management in Member States.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Because of the critical nature of water resources problems, increasing emphasis has been placed on strengthening external and internal partnerships for synergistic benefits. Also, to be more responsive to the rapidly growing variety of water resources issues, the programme has been reorganized into three subprogrammes from two.

2.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	3 386 477	3 386 378
Extrabudgetary	—	—
Unfunded	—	—

Specific criteria for prioritization:

1. Linkage with investment priorities of multilateral development assistance organizations.
2. Member State needs expressed in GC resolutions.
3. Comparative advantage of the technology and of the Agency.

Subprogramme 2.3.1 Sustainable Water Use and Services

Rationale: The global per capita availability of renewable water resources declined between 1950 and 2000 by 58% to its current level of approximately 6560 cubic metres per capita per year (m^3/c/a). Between 2000 and 2015, it is expected to drop by an additional 15%, to 5560 m^3/c/a, as world population climbs toward a projected 7.2 billion. Besides population, anthropogenic activities (irrigation, industry, urban settlements) induce pollution and contribute to the declining availability of water resources. Groundwater continues to be a major source of fresh water for drinking and irrigation worldwide. In many cases, groundwater from non-renewable aquifers is being used to increase food production, making both the water supply and food production unsustainable. Planners and managers in Member States need an improved knowledge base of hydrological information to make appropriate decisions for the sustainable management of their surface and groundwater resources, including adaptation for the impacts of climate change. Isotope techniques offer cost effective means for obtaining hydrological information. In addition, Member States need assistance in using this information for resource management strategies and policies, and in strengthening related human and institutional capacity.

Objective: To improve Member State capacity to assess and use water resources in specific regions, ecosystems, and climate regimes.

Outcome	Performance Indicator
— Ability of Member State institutions to effectively utilize isotope techniques in project planning and implementation.	— Extent to which water management and/or other technical institutions participate in and receive Agency assistance for using isotope techniques.

Programmatic changes and trends: This is a new subprogramme to address emerging priorities in sustainable water resources management. One of the projects in the Subprogramme, 2.3.1.1, (Exchange of information training and cooperation with international organizations in isotope hydrology) is on going (previously G.1.01). Project 2.3.1.1 strengthens human resources in isotope hydrology and helps disseminate information. Project 2.3.1.2, Support to Member States for the management of national and transboundary groundwater resources, is new and is designed to leverage the Agency's resources and expertise in partnership with other international organizations, particularly the GEF, to assist Member States in better managing their national and transboundary groundwater resources, as well as developing strategies for coping with the impact of climate change on the hydrological cycle.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 66.3% (€253 905) in 2008 as compared to similar activities conducted in 2007 under other subprogrammes, and a decrease of 1.5% (€9 400) in 2009 as compared with 2008. The subprogramme is achieving efficiency gains by partnering with other agencies on transboundary and global water problems in addition to other areas.

2.3.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	653 852	644 245
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
2.3.1.1 Exchange of information, training and cooperation with international organizations in isotope hydrology ***Duration:*** 2004–2009 ***Priority:*** 1	Newsletters on isotopes in water resources management and updated teaching and training materials on isotope hydrology, including audio-video products; support to Member State scientists in obtaining advanced degrees in isotope hydrology at the UNESCO-IHE in Delft, Netherlands; expanded network of Member State isotope and hydrology professionals and greater cooperation between them.
2.3.1.2 Support to Member States for the management of national and transboundary groundwater resources ***Duration:*** 2008–2011 ***Priority:*** 1	Three national or transboundary groundwater projects on partnerships with other agencies; implementation of TC projects.

Subprogramme 2.3.2 Isotope Methods for the Improved Understanding of the Water Cycle

Rationale: An improved understanding of the time and space distribution of water on Earth, or the water cycle, is imperative for the management of the renewable water resources available in rivers, lakes and shallow aquifers. The JPOI and the G-8 Action Plan for Water have specifically identified understanding of the water cycle as a critical part of global actions required for sustainable development. Isotopes of oxygen, hydrogen and carbon are unique tracers providing unmatched insight into the physical processes responsible for the movement of water in the water cycle. The use and development of isotope applications for understanding the water cycle requires global isotope data. The primary components of the Earth's hydrological cycle are precipitation, river flow, evaporation and transpiration from the land surface. The Agency has initiated and maintained (jointly with WMO) a global network of isotopes in precipitation (GNIP) for the last 40 years which has provided critical data for simulating the water cycle in climate models. Continued isotopic monitoring of precipitation provides an ability to understand the processes influencing the amount and geographical distribution of precipitation. Thirty-five per cent of continental precipitation is discharged into the oceans through river runoff and isotope monitoring of river systems provides reference data for water balance studies and for the analysis of climate and environmental changes in large river basins. Evaporation and transpiration account for a large part of the remaining precipitation losses on the continents and the rest of the precipitation is recharge of shallow groundwater. A global survey of isotope contents of air moisture and leaf water on different types of vegetation would provide an effective tool for improved water balance calculations and assessment of climate change and development impacts. Isotope techniques also provide a means to map renewable and non-renewable groundwater resources, improve irrigation management by optimizing the efficiency of irrigation water use, understand the fate and transport of nutrients and other agricultural contaminants in rivers, lakes and aquifers, as well as to facilitate the management of transboundary rivers and aquifers.

Although critical to the practice of isotope hydrology, these reference data are not collected on a global scale, nor are they disseminated in the public domain by any other institution. The role of the Agency in providing global isotopic data and related methodologies is well recognized by the isotope hydrology community in both developed and the developing Member States. Through General Conference resolutions, Member States have requested the Agency to assist them in strengthening their capacity for isotope measurements.

Coordinated research, while helping to develop, test and adapt isotope techniques under a variety of hydrogeological conditions, also strengthens the capacity of Member State institutions for research and use of these techniques.

Objective: To enable Member States to use isotope techniques for water resources management.	
Outcome	**Performance Indicator**
— Isotope data and methodologies for water cycle components are available and used for research and practical applications in Member States.	— Number of Agency provided or managed isotope databases and networks for precipitation, rivers and groundwater.

Programmatic changes and trends: This subprogramme includes two of the three projects previously in G1 and one project previously in G2 (in the 2006-2007 programme cycle). Both of these projects were scheduled for completion in 2009. The new subprogramme structure is considered to better reflect the objective and outcomes of the water resources programme. As a result, new projects related to data collection and analysis for water cycle studies will be proposed in the 2010-2011 cycle.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 38.7% (€853 469) in 2008 as compared with 2007, and an increase of 0.7% (€9 400) in 2009 as compared with 2008. The subprogramme envisages efficiencies through the use of consultants and experts to help accomplish programme and Member State goals and objectives, and is working with internal partners in the Agency to address water quality and agricultural practice issues.

2.3.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 389 049	1 398 509
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
2.3.2.1 Isotope methods for the assessment of groundwater sustainability ***Duration:*** 2004–2009 ***Priority:*** 1	Report on improved approaches for assessing groundwater sustainability; methods for isotope based groundwater assessments, including maps, atlases and reports; reports on isotopic methods for the age dating of base flow as a means for assessing groundwater sustainability and on relative advantages of different isotopes for quantifying groundwater recharge and age.
2.3.2.2 Development of isotope methodologies for water quality assessment and management ***Duration:*** 2004–2009 ***Priority:*** 1	Reports and guidebooks on the use of isotopes in artificial recharge and storage, pollution assessment and mitigation in river basins; report on the use of isotopes for the assessment of oxygen availability in root zones and surface water bodies.
2.3.2.3 Isotope methods for the study of water and carbon cycle dynamics in the atmosphere and biosphere ***Duration:*** 2004–2009 ***Priority:*** 1	Strengthened global isotope data networks managed by the Agency; improved Member State access to the data through the Internet; statistical tools and methods for better understanding the nature and causes of spatial variations in isotopes.

Subprogramme 2.3.3 Analytical Services for Isotope Hydrology

Rationale: Reliable and accurate isotope measurements are essential for the application of isotope methodologies in the water sector. Member States, through General Conference resolutions, have requested the Agency to strengthen their ability for isotopic analyses and to help establish regional resource units. Improved quality of analysis is achieved through calibration with reference materials and continued comparison of results from different laboratories on a common sample. The Agency is the primary source of reference materials that are used for making precise isotopic measurements. These reference materials are equally necessary for isotope measurements in both developing and developed Member States. They also require the assistance of the Agency to establish and maintain a laboratory network that can provide reliable analytical data and fulfil the analytical needs of national and regional TC projects, as well as to develop local capacity. In addition, new facilities to improve the measurement of isotope data (such as helium isotopes), or facilitate the establishment of laboratories at a much reduced cost need to be continually explored and evaluated.

Objective: To enable Member States to provide analytical services for isotope hydrology at national and regional levels.

Outcome	Performance Indicator
— Improved Member State capacity for the isotope analysis of hydrological samples.	— Extent to which Member States are able to produce high quality isotope data in their own laboratories.

Programmatic changes and trends: The focus of this subprogramme is on increasing Member State ability to produce their own isotope data and to provide those services that facilitate strengthening of their capacity. In addition, the subprogramme focuses on establishing a network of Member State laboratories to support national and regional TC projects.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 65.1% (€514 561) in 2008 as compared with 2007, and no change in 2009 as compared with 2008. Working with experts to initiate development of an improved and standardized sample submission approach will reduce sample and data management efforts and improve quality by ensuring that proper and consistent information is submitted to the Agency and analytical laboratories.

2.3.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 343 576	1 343 624
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
2.3.3.1 Development of Member State capacity for isotope analysis of hydrological samples ***Duration:*** Recurrent ***Priority:*** 1	Expanded network of Member State laboratories providing isotope analysis for national and regional TC projects; guidebooks and measurement protocols for a laser based instrument for the analysis of stable oxygen and hydrogen isotopes; integration of the laser instrument into Member State laboratories through the TC programme and extrabudgetary resources.
2.3.3.2 Development of helium isotope applications for water resources management ***Duration:*** 2004–2009 ***Priority:*** 1	Improved sampling methods for helium isotope analysis; demonstration study to test and validate the use of helium isotopes for groundwater recharge estimation.

Programme 2.4 Environment

Rationale: The United Nations Conference on Environment and Development (UNCED), held in Rio in 1992, produced several agreements, including Agenda 21 and the 27 principles of the Rio Declaration. In 2000, the Millennium Development Goals were published. These initiatives addressed environmental issues and emphasized that in order to achieve sustainable development, environmental protection efforts conducted at the international level should be an integral part of the development process. In 2002, this global commitment to sustainable development was once again addressed at the WSSD in Johannesburg. Here, a comprehensive review and assessment of the progress achieved since Rio was carried out, resulting in recommendations for future actions for the maintenance of a high quality of ecosystems such as ocean and fresh waters, soil, air and other natural resources without compromising industrial and agricultural production.

In the framework of its mandate to encourage and assist practical applications of and research on nuclear techniques for sustainable development and environmental health, and responding to the requests of its Member States through General Conference resolutions, the Agency has over the years demonstrated that nuclear techniques can play an important role in the management of the environment. Within this programme, the behaviour and sink of radionuclides and non-radioactive pollutants in the environment are investigated in order to develop and improve transfer models used for ecological assessments, and to elaborate appropriate remediation strategies for stakeholders while simultaneously providing input for the derivation of nuclear safety standards and radiation protection regulations.

The programme will contribute to the ecological and economic sustainability of clean and healthy environments including the restoration of polluted environments, and to risk assessment studies and thus to overall improved conditions for human well-being in Member States. It will further provide scientific assistance to international organizations such as WHO, IMO, WMO, UNDP, UNEP, UNESCO, UNSCEAR and FAO, and contribute to capacity building in Member States in Eastern Europe, South America, Africa and Asia who are experiencing elevated levels of radiation or pollution, whether natural or anthropogenic in origin.

Objective: To enhance the capabilities of Member States in understanding environmental dynamics and the identification and mitigation of marine and terrestrial environment problems caused by radioactive and non-radioactive pollutants using nuclear techniques.

Outcomes	Performance Indicators
— Improved understanding of environmental processes, impacts and fate of pollutants in marine and terrestrial environments of Member States through the use of nuclear techniques.	— Number of published studies and surveys on the fate of priority and emergent pollutants in the marine and terrestrial environments of Member States.

Outcomes	Performance Indicators
— Increased transfer to Member States of isotopic applications to understand, protect and manage their marine and terrestrial environments.	— Number of fellowships/training conducted in the marine and terrestrial environment. — Number of inter-agency and international collaborations in the marine and terrestrial environment.
— Improved quality of work by Member State analytical laboratories through the use of Agency recommended techniques and processes for monitoring, assessment studies and environmental management, reference materials, and inter-laboratory comparison exercises.	— Number of reference materials provided on request to Member State laboratories.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: This programme was re-configured in 2006 to align with the Medium Term Strategy 2006–2011. The changes in this biennium include a new Project 2.4.4.4 (Reference Material for Environment and Trade) to harmonize the production, characterization and provision of environmental reference materials and interlaboratory comparison exercises conducted in different areas of Major Programme 2.

2.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	5 405 195	5 404 658
Extrabudgetary	699 042	699 042
Unfunded	415 000	530 000

Specific criteria for prioritization:

1. The first priority is given to projects that make significant contributions to understanding and managing radionuclides in the environment, and to the processes that regulate the dispersion and fate of pollutants.
2. The second priority is given to projects that provide quality assured data on radionuclides and other pollutants in order to improve Member State environmental knowledge and management capabilities.
3. The third priority is given to assisting Member States with environmental projects that are under way, or to issues that are identified either by international organizations or as outcomes of major conferences.

Subprogramme 2.4.1 Marine Environmental and Radiological Assessment (MERA)

Rationale: While the resources of the ocean and regulation of the climate are ultimately issues of global concern, the quality and vitality of the marine environment and its living resources are critical strategic priorities for over 75% of the Agency's Member States which have coastlines. Recommendations made at the WSSD in Johannesburg placed the environmental quality of the oceans, land and habitats as central to sustainable economic development. The IAEA Marine Environment Laboratories (IAEA-MEL) in Monaco, as the only marine laboratories in the UN system, have been providing surveys and analytical methods for radionuclides, metals and organic contaminants, as well as scientific and technical support for capacity building, to regional groups of Member States, such as those in the Mediterranean, Black Sea and South East Asia, and to international bodies, such as UNEP Regional Seas, UNDP, International Waters Project, Oslo Paris Commission, Helsinki Commission, Mediterranean Pollution Programme, Regional Organization for the Protection of the Marine Environment, and Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP).

Comprehensive marine environmental assessments require reliable identification and measurements of natural and anthropogenic radionuclides, metals and organic contaminants. Reliable radioactive and non-radioactive contaminant data underpin checks on statutory compliance and on transboundary pollution and track environmental improvement throughout remediation programmes. By combining contaminant surveys with nuclear and isotopic tools, a more rigorous and relevant assessment of sources, fluxes, fates and ultimate impacts of regional and global marine pollution will be undertaken by IAEA-MEL Monaco. This integrated approach uniquely provides the new pollution diagnostics and solution options needed by Member States committed to a sustainable future development of their marine environments. Their implementation requires support for methodological development, quality management, training in low level analyses and new integration products,

including an Internet accessible database on marine radionuclides and tracers, models of radionuclide transfer in the ocean and tracer applications.

Objective: To enable Member States to reliably assess current and future levels of radioactive and chemical contaminants in the marine environment, and to apply radionuclides and isotopes in diagnosing, tracking and abating marine pollution.	
Outcomes	**Performance Indicators**
— Increased application of nuclear and isotopic techniques in the measurement and assessment of non-radioactive pollution in contrasting marine environments.	— Number of projects on marine pollution developed through an integrated approach by IAEA-MEL.
— Improved quality and reliability of radionuclide and contaminant data.	— Number and performance of Member State laboratories taking part in intercomparison exercises and requesting reference materials of marine origin. Number of Member States using reference methods published by IAEA-MEL.

Programmatic changes and trends: Integration of radioactive and non-radioactive pollution assessments will be improved.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 7.0% (€102 163) in 2008 as compared with 2007, and a decrease of 1.5% (€23 000) in 2009 as compared with 2008.

2.4.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 612 418	1 588 639
Extrabudgetary	534 846	534 846
Unfunded	415 000	—

Projects

Title, duration and priority	Main outputs
2.4.1.1 Measurement and assessment of natural and anthropogenic radionuclides in the marine environment ***Duration:*** Recurrent ***Priority:*** 1	New data on radionuclide distributions, time trends and impact in the marine environment made available to Member States through publications and an Internet accessible database; reports and peer reviewed scientific papers on the assessment of natural and anthropogenic radionuclides and their applications as tracers in the marine environment.
2.4.1.2 Diagnosing contaminant sources and fates using nuclear and isotopic techniques ***Duration:*** Recurrent ***Priority:*** 1	Regional assessments of the state of the marine environment based on marine contaminant screening programmes; analyses of pollutants in marine biota, especially seafood; training courses in sampling techniques.
2.4.1.3 Quality management for monitoring marine contaminants and toxins ***Duration:*** Recurrent ***Priority:*** 1	Marine reference materials; global and regional interlaboratory studies; reports and publications on the results of the interlaboratory studies; assistance to capacity building programmes, encompassing recommendations for the selection of instruments and the provision of training courses in the analysis of radioactive and non-radioactive contaminants in marine matrices.
2.4.1.4 Novel methods for measuring low level radionuclide concentrations in marine samples ***Duration:*** Recurrent ***Priority:*** 3	Development of methods for low level and non-destructive analyses of radionuclides, including the development of guidelines for sampling, sample pre-treatment, radiochemical separation, spectrometric analyses and interpretation of results; CRP on benchmarking calibration of low level gamma spectrometric measurements of environmental samples; collaboration with large scale analytical facilities to analyse small samples with state of the art technologies.

Subprogramme 2.4.2 Radioecological and Isotopic Solutions for Coastal Marine Problems (RISCMAR)

Rationale: Problems of erosion and sedimentation, freshwater losses, desalination and contaminant ecotoxicity are increasingly affecting the ecology and capacity for sustainable development in coastal marine environments. Nuclear and isotopic techniques provide unique and cost effective tools to quantify coastal transport processes and track the bioaccumulation, toxicity and fate of the huge surge in diversity and quantities of synthetic and other contaminants entering marine ecosystems from land based sources.

Rivers and groundwaters carry unique natural radiochemical and stable isotopic fingerprints (e.g. Rn, U, Th, C-13, N-15) which enable these inputs to be quantitatively distinguished and followed in time within the mixing zones of estuaries, coastal and shelf waters. Sediment sources, transport, mobility, accretion and deposition can also be assessed and dated from their ambient radionuclide and isotopic signatures, or tracked by novel adsorbed and neutron activatable tracers in natural sediments.

Robust laboratory and field based radioecological and radiotracer studies are invaluable in making reliable predictions of the behaviour, uptake and transfer of radionuclides, in order to make credible marine radiological, toxicological and food chain risk assessments of local nuclear releases. Moreover, numerous land based industrial, mining, domestic and agricultural activities result in substantial input of other potentially toxic compounds, including metals, nutrients and organic pollutants, into coastal marine waters. These contaminants are not only bioaccumulated by marine organisms and transferred along the food chain, but they can also cause detriment to the biodiversity and biomass of marine ecosystems. For example, increased incidence of harmful algal blooms (HABs) of saxitoxin-containing species, which bioaccumulate in shellfish and affect humans, are triggered by excess nutrients and organic waste products from intensive agriculture and aquaculture.

Research on specific marine processes is required to enhance capabilities of Member States in the effective management and protection of their coastal zones. This subprogramme develops and uses nuclear and isotopic techniques to obtain critical information and provides advice to Member States on the following: coastal hydrodynamics, processes involved in the bioaccumulation, biodistribution and transfer of radionuclides, metal and organic contaminants and HAB biotoxins, and assessment of candidate International Commission on Radiological Protection (ICRP) Marine Reference Organisms and other organisms relevant to the assessment process.

Objective: To enhance capabilities of Member States to understand key marine physical processes governing the transport and fate of contaminants and other elements in coastal environments, and to help Member States to develop and apply laboratory and field based experimental radiotracer techniques for assessing the behaviour of chemical contaminants in marine biota.	
Outcomes	**Performance Indicators**
— Acquisition of new knowledge on hydrodynamics and sedimentology of coastal marine environments, based on the application of nuclear and isotopic techniques. Identification of applications of these nuclear based technologies for contaminant assessment in the coastal environments of Member States.	— Number of case studies in Member States using nuclear applications to study the transfer and behaviour of natural and artificial radionuclides and other contaminants in environmental media of their coastal zones.
— Enhanced capability of Member States to apply nuclear techniques for assessing impacts of natural and artificial radionuclides, and other contaminants, including HABS, in the coastal environment and to obtain information on bioaccumulation of contaminants required for improving health and environmental risk assessment models.	— Number of Member States using radiotracer techniques to assess and interpret impacts of land based anthropogenic activities and of varying environmental factors on contaminant transfer and fate in marine coastal zones. — Number of international and Agency publications jointly by Agency and Member State scientists.
— Increased knowledge of contaminant pathways and fate of contaminants in marine organisms; enhanced knowledge of the mechanisms of human exposure to chemical contaminants and HAB toxins through seafood consumption.	— Number of scientific communications presented at internationals conferences and scientific papers on experimentally derived data on toxic metals, organic compounds and HAB toxins in marine organisms and seafood, and on radioecological data in coastal zones.

Programmatic changes and trends: This is a continuation and evolution of the former Subprogramme 2.4.2 (2006-2007) and its four component projects. The project on "Nuclear and Isotopic Studies of Coastal Zone Dynamics" is the continuation of the previous project on submarine groundwater discharges, expanded to include isotopic hydrodynamics of marine sediments. The project "Bioaccumulation and Transfer of Radionuclides in Coastal Environments" will give more emphasis to more sensitive life-stages of marine biota. Studies on candidate Marine Reference Organisms as global radioecological bio-monitors will be continued. The project "Tracing HABs Toxins and Contaminants in Seafood with Nuclear-Based Techniques" is a further development of experimental radiotracer and radioassay work to assess bio-availability, transfer pathways and behaviour of HAB toxins and of organo-metals, that was expanded with additional human resources allocated in the previous cycle. The project "Investigations of Marine Ecotoxicological Impacts Using Nuclear-Based Techniques" extends activities carried out in the previous cycle in a related project. It will focus on marine ecotoxicity of land-based contaminants (mining, sewage and detergents) on coastal bio-indicator organisms with more application of nuclear imaging technologies to enhance understanding of contaminants distributions in marine biota.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 16.9% (€188 351) in 2008 as compared with 2007, and a further increase of 4.6% (€60 329) in 2009 as compared with 2008.

2.4.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 341 355	1 403 021
Extrabudgetary	37 103	37 103
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
2.4.2.1 Nuclear and isotopic studies of marine coastal zone dynamics ***Duration:*** Recurrent ***Priority:*** 2	Data on seawater-groundwater interactions in coastal zones; transport of contaminants from land based sources and sediment dynamics using radioactive and stable isotopes tracers; novel adsorbed and neutron activatable tracers; new methods for in situ monitoring of contaminants, and their transfer to Member States; support for the provision of in service training in using nuclear and isotopic techniques for assessing impacts of radioactive and non-radioactive contaminants in coastal environment and for improving environmental risk assessment models.
2.4.2.2 Bioaccumulation and transfer of radionuclides in coastal environments ***Duration:*** Recurrent ***Priority:*** 1	Data on of transfer, fluxes, behaviour and fate of natural and artificial radionuclides and analogue elements in coastal food chains and ecosystems, and transfer to Member States through reports and scientific publications; data relevant to the estimation of radiation exposures of candidate marine reference and other organisms; training in measuring natural and artificial radionuclides to assess environmental contamination.
2.4.2.3 Tracing HAB toxins and contaminants in seafood with nuclear-based techniques ***Duration:*** 2006–2011 ***Priority:*** 1	Member States scientists trained in using radiotracer and other nuclear based techniques to obtain information on transfer pathways and bioaccumulation rates of HAB toxins and chemical contaminants required for improving risk assessment for fisheries, aquaculture products and natural food chains; information on seafood safety exchange.
2.4.2.4 Investigations of marine ecotoxicological impacts using nuclear based techniques ***Duration:*** 2008–2011 ***Priority:*** 2	Data on contamination pathways, bioconcentration factors, transfer rates and possible detoxification/metabolization of inorganic and organic contaminants originating from land based mining and domestic activities, and their transfer to Member States through reports and scientific publications; training in the use of radiotracers to assess contamination pathways, fluxes and fate of marine inorganic and organic contaminants.

Subprogramme 2.4.3 Ocean Climate Coupling and Carbon Cycling (OC4)

Rationale: The Intergovernmental Panel on Climate Change (2001) has assembled compelling scientific evidence that links the global warming of 0.6°C recorded since the mid-19th century due to the build up of atmospheric CO_2 originating from the combustion of fossil fuels. Consequences of this 'greenhouse' warming include: (1) changes in the frequency and magnitude of the Monsoon, El Niño Pacific and North Atlantic oscillation weather regimes, which will alter regional climate, rainfall, fisheries and crop yields; and (2) a sea level rise of 1-2 cm/decade which threaten floods in coral islands and low lying deltas and widespread erosion in coastal regions.

The ocean exerts a control on the Earth's climate and is a major sink for atmospheric CO_2: it moderates the greenhouse trend to higher temperatures. Marine photosynthesis by phytoplankton in the surface waters converts CO_2 into organic material which then fuels marine food chains; ultimately this organic material sinks to be deposited in marine sediments. Thus, sediments record past changes in the Earth's climate. Ocean nutrients, especially nitrate and phosphate, ultimately regulate the biological removal of carbon from the upper ocean and the carbon flux to the seafloor. In coastal regions, rivers can discharge high concentrations of nutrients from soils, domestic waste and agricultural fertilizers. High nutrient concentrations stimulate excess phytoplankton blooms, leading to 'eutrophication', which is characterized by oxygen depletion and fish kills in coastal regimes. Nutrient eutrophication events are increasingly frequent and widespread and have been identified by GESAMP as a major concern to coastal Member States.

Objectives:

— To enable Member States to apply nuclear and isotopic techniques to investigate coastal and oceanographic processes of carbon and nutrient cycling of relevance to ocean climate change.

— To improve the understanding of nutrients dynamics and blooms that increasingly impact coastal and oceanic waters.

Outcomes	Performance Indicators
— Improved isotopic capability and understanding by Member States of nutrient impacts, fates and algal blooms in contrasting marine environments.	— Number of Member States using isotopic techniques to assess nutrient impacts, fates and blooms in their marine environment.
— Enhanced use of isotopic tools to improve the understanding of the biogeochemical cycling of carbon and organic material in the marine environment and its effects on climate.	— Number of international peer reviewed publications and Member State laboratories using isotopic techniques to study carbon cycling and to reconstruct past climate records.

Programmatic changes and trends: This is the continuation of Subprogramme H.3 in 2006–2007. The main changes foreseen for 2008-2009 in this subprogramme will be: (1) to initiate a CRP on isotopic applications in biological oceanography and marine biodiversity; (2) to compare U/Th versus Pb/Po disequilibria methods for ocean carbon sinks; (3) to extend the CRP on "El Niño tracers" to other sea areas; and (4) to develop isotope calibrated ocean circulation climate models. More emphasis will be placed on assessment and cross-validation of the U/Th disequilibria technique to quantify carbon flux. This will be undertaken by direct measurements using particle traps, other radioisotopic disequilibria like Pb/Po and the localization of these radioisotopic tracers in different types of marine particles, in collaboration with ICTP. These approaches will further improve the understanding of particle and carbon flux in the oceans.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 34.8% (€335 510) in 2008 as compared with 2007, and a further decrease of 5.9% (€37 329) in 2009 as compared with 2008.

2.4.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	647 994	609 491
Extrabudgetary	127 093	127 093
Unfunded	—	380 000

Projects

Title, duration and priority	Main outputs
2.4.3.1 Isotopic studies of nutrient dynamics and algal blooms ***Duration:*** Recurrent ***Priority:*** 2	Improved methodology for studying biological productivity in oceanic waters, and water quality with respect to nutrients and eutrophication in the coastal marine environments of Member States; tracking nutrient dynamics in sea water; development, validation and transfer to Member States of nutrient isotope studies; publications on nutrient dynamics; CRP on isotopic applications in biological oceanography, fertility and biodiversity.
2.4.3.2 Nuclear and isotopic applications to quantify ocean carbon cycling ***Duration:*** 2006–2009 ***Priority:*** 2	Improved isotope methodologies for studying sources of organic materials (C-13 biomarkers) and carbon fluxes (U/Th and Pb/Po profiles) in oceanic waters and the coastal marine environments of Member States; in-service training in the application of natural radionuclides techniques to establish transfer pathways of carbon in the marine environment; publications on carbon cycling.
2.4.3.3 Marine isotopic records and models to assess climate change ***Duration:*** 2006–2011 ***Priority:*** 2	Isotopic tools for environmental change investigations based on model case studies carried out during the project; CRP on nuclear and isotopic studies of the El Niño phenomenon in the ocean, to collect sea temperature records over the past few hundred years and information on past climate changes; Oceanic Global Circulation Model for computer modelling of the distribution of isotopes in the oceans; atmosphere-ocean coupling and climate change studies developed in collaboration with ICTP; training on climate change studies in the marine environment.

Subprogramme 2.4.4 Supporting Analytical Laboratory Performance

Rationale: Reliable and comparable results are an essential requirement for any decision based on analytical measurements. In addition they form the basis for international trade as well as for assessments and actions related to mitigation of incidents and sustainable development. When related to environmental assessment, management and development two important additional components need to be considered, namely sampling and modelling. A large number of environmental parameters need to be taken into account, in addition to available analytical methods for determination of the analytes of interest, which requires that laboratories demonstrate the quality of their measurement capacities and results. This is especially important for 'global assessments', when decisions are made on the basis of results produced by different laboratories. A harmonized approach in statistical evaluation, reporting, quantification of measurement uncertainty and metrological traceability is required internally to the different laboratory activities of the Agency as well as in the case of laboratory networks.

The following are among the most important tools for supporting and demonstrating quality in measurement results: (i) an established quality system; (ii) the regular use of reference materials; and (iii) frequent participation in proficiency tests and laboratory intercomparisons. These three tools are all supported in relation to the use of nuclear techniques and radiological assessment in this subprogramme.

A well established and operational laboratory network can contribute to meeting these requirements. The Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) network is coordinated within this subprogramme. The major objective of ALMERA is to provide support to laboratories nominated by their Member States for environmental monitoring, and provide assistance in situations requiring a speedy response in the case of any releases of radionuclides into the environment.

Objective: To have high performance quality systems operating in Member State analytical laboratories (especially members of the ALMERA network) according to international standards.

Outcome	Performance Indicators
— Improved and formally demonstrated quality of laboratory activities, including sampling, measurement results and other laboratory products allowing mutual acceptance of measurement results.	— Number of Member State scientists trained in analytical methodology and quality systems. — Number of reference materials provided on request to Member State laboratories — Number of ALMERA laboratories participating in Agency interlaboratory comparison exercises.

Programmatic changes and trends: A new project is been introduced on the harmonization of the production, characterization and provision of the Agency's reference materials.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 6.5% (€62 612) in 2008 as compared with 2007, and no change in 2009 as compared with 2008. Increasing interest in and membership of the ALMERA network requires greater resources to be directed in this area; these are being made available as the improved quality management activities reach implementation and are phased out.

2.4.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 051 496	1 051 543
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
2.4.4.1 Laboratory quality management activities and metrology ***Duration:*** 2006–2011 ***Priority:*** 2	An operational quality system according to ISO Guides 34, 43 and 17025 in selected activities of the Agency's Laboratories; training of staff from Member State laboratories in the implementation and maintenance of appropriate quality systems; coordination of a working group of Member State laboratories collaborating on characterization of terrestrial reference materials; cooperation with other international organizations with respect to quality and metrology.
2.4.4.2 Reference materials for terrestrial environments ***Duration:*** Recurrent ***Priority:*** 1	Reference materials provided to Member States; new terrestrial environment reference materials; proficiency tests and advice to Member State laboratories regarding their analytical performance; contribution to the Agency's reference materials catalogue; database of Agency recommended analytical procedures for the analysis of terrestrial environment samples; personnel trained.
2.4.4.3 Agency network of laboratories for measuring radionuclides in the environment (ALMERA) ***Duration:*** Recurrent ***Priority:*** 1	Operational Agency network of laboratories for rapid response in measuring radionuclides in environmental samples; standardized methods for assessing radionuclide concentrations in environmental samples; reliable and consistent information on environmental radionuclide concentrations; advice to international or national governing bodies in respect of assessment of environmental radioactivity.
2.4.4.4 IAEA reference materials for environment and trade ***Duration:*** Recurrent ***Priority:*** 1	Guidelines for reference material production and certification; consolidated Agency reference material catalogue; consolidated Agency website for customer interaction.

Subprogramme 2.4.5 Sustainable Management of the Terrestrial Environment

Rationale: Industrial and mining activities, including energy production by using fossil fuels and nuclear power plants, often result in the release of radionuclides and other pollutants into the environment. This has an impact on humans and biota, with consequences for health and sustainability. The fate and impact of contamination therefore needs to be studied to provide effective preventive, diagnostic and remediation measures for different terrestrial ecosystems. Thus, proper management of the terrestrial environment requires (in addition to monitoring and analytical capacities) an assessment of the contamination, i.e. identification of the relevant pathways and driving parameters and, based on those, the development of site specific prediction models and environmental decision support tools. These can be used for local and regional assessments and remediation strategies, if needed, and need to be cost effective and socially acceptable.

In addition to radiological impact applications, radioisotopes can be used as tracers of ecological processes with the goal of understanding these processes. Examples include the use of radon-222 and beryllium-7 as tracers of air mass movements in the atmosphere, and the use of fallout lead-210 and caesium-137 for sedimentation studies in fields, lakes and rivers.

Objective: To enhance the capabilities of Member States to understand key processes in terrestrial environments, and to adopt and assess suitable and sustainable remediation strategies.	
Outcome	**Performance Indicator**
— Use of radioisotope tracers, and nuclear and related analytical techniques, for understanding and investigating the transport and fate of radionuclides and non-radioactive pollutants in terrestrial environments, and to apply feasible remediation strategies.	— Number of reports and papers published in collaboration with Member State institutions.

Programmatic changes and trends: Increased emphasis is given to the use of radionuclides and isotopes in the study of environmental processes, particularly related to air quality. CRPs on the development of methodologies for radon surveys and on the impact of radioactive particles on human and non-human species in the environment will be initiated.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 0.9% (€6 502) in 2008 as compared with 2007, and no change in 2009 as compared with 2008.

2.4.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	751 932	751 964
Extrabudgetary	—	—
Unfunded	—	150 000

Projects

Title, duration and priority	Main outputs
2.4.5.1 Terrestrial radioecology ***Duration:*** Recurrent ***Priority:*** 1	Data for radionuclide transfer parameters; personnel trained; reports, publications and conference proceedings.
2.4.5.2 Ecotoxicology ***Duration:*** Recurrent ***Priority:*** 2	Publications on the use of radioisotope techniques in ecotoxicology; personnel trained in the use of nuclear techniques for assessing impacts of radioactive and non-radioactive contaminants in the terrestrial environment; improved environmental risk assessment models.
2.4.5.3 Remediation strategies ***Duration:*** Recurrent ***Priority:*** 2	New and improved methods for remediation measures; data from site specific cases; guidelines for remediation efficiency assessment; personnel trained.

Programme 2.5 Radioisotope Production and Radiation Technology

Rationale: Radioisotopes and radiation techniques are widely applied in such fields as medicine, industry, agriculture and the environment, contributing significantly towards sustainable development and improving the quality of life in developed as well as in a number of developing countries. The potential for expansion of radioisotope products and their applications and the resultant benefits to developing countries continues to be high. The Agency's support has enabled Member States to benefit from the use of radioisotope products and techniques in developing their science and technology base, as well as contributing to the national economy. Additional fields of application as well as improved techniques continue to evolve.

Among the radioisotope products in demand for medical imaging, positron emitters grew significantly due to the superior information content available from such imaging studies, particularly the ability to advance evidence based decision making for therapy of cancer patients. Consequently, interest in establishing medical cyclotrons for radioisotope production is growing. Support to interested Member States is needed to enhance the utilization of medical cyclotron and national radioisotope processing facilities.

In close coordination with Subprogramme 1.4.2, Research Reactors, this programme will support development of methods for the production of molybdenum-99 using low enriched uranium (LEU) targets, required due to the phasing out of highly enriched uranium (HEU) from international commerce. Reliable, assured availability of

molybdenum-99 is essential for the preparation of technetium-99m generators used extensively in diagnostic imaging.

Radiation processing has shown promise for tackling a number of pollutants. In view of the hazards of known organic pollutants and the difficulties in conventional treatment methods, exploration of the applicability of radiation based techniques is needed. Continuing support in combating other environmental pollutants, for example flue gases from the burning of fossil fuels and wastewaters, are of high utility to many Member States.

Radiation processing is also a promising method for the development of novel advanced materials such as polymeric nano composite coatings and synthesis of nano gels. Enhanced surface-mechanical properties of the former (transparent, scratch and abrasion resistant), and potential applications of the latter in health care and biotechnology are of significant value. Support for the synthesis/modification of advanced materials would be of value to many Member States.

Radiotracer and sealed source techniques continue to be widely used in various industries to achieve better control of production processes; improve process efficiency; enhance product quality; and raise productivity. Low cost digital radiography systems and the SPECT technique (the latter adopted from nuclear medicine), are useful in the diagnosis of malfunctioning industrial processing systems. Research activities to refine industrial processes and raise productivity merit support, while in the areas of industrial applications (e.g. radiotracer and sealed source techniques, non-destructive testing (NDT)), developing Member States need standardized procedures/protocols as guidelines and training materials.

Many Member States embarking on new development plans continue to seek the Agency's support in capacity building and strengthening their national infrastructure to benefit from the technologies mentioned above, as evident from the consistently large number of requests for TC support. There is also a need to support new development efforts and catalyse those which are promising for timely deployment. This programme would therefore respond to Member State requests for supporting development as well as adaptation of appropriate technology for emerging radioisotope products in medical and industrial applications.

Objective: To contribute to improved health care and safe and clean industrial development in Member States through the use of radioisotopes and radiation technology, and to strengthen national capabilities for producing radioisotope products and utilizing radiation technology for socioeconomic development.	
Outcome	**Performance Indicator**
— Enhanced Member State capability in the application of radioisotope products and radiation technology as tools for sustainable development.	— Number of Member State laboratories interested in the methodologies developed/improved for various techniques and applications.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: The need for stronger coordination of activities related to radiopharmaceuticals in this programme with the Human Health programme is addressed by 'complementary projects' on the developmental aspects of radioisotopes and radiopharmaceuticals. The preference for outcome oriented formulation of projects in place of technology based projects is reflected in the phasing out of projects dealing with radioanalytical techniques and industrial radiography, but two other projects under 2.5.2 are now enlarged in scope to include the tasks to be completed.

2.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 969 056	1 969 020
Extrabudgetary	—	—
Unfunded	—	96 000

Specific criteria for prioritization:

1. Projects which contribute to new and emerging areas of radioisotopes and radiation technology applications, where these techniques have a distinct advantage in meeting the needs and interests of Member States.
2. Projects which support or enhance the Agency's role in accelerating the adoption of radioisotopes and radiation technology and result in services, the transfer of know-how and the demand for new TC projects from developing Member States.
3. Activities in selected areas purely for the transfer of knowledge and to increase academic capabilities, and are of benefit to Member States in the long term.

Subprogramme 2.5.1 Development of Radioisotope Products for Medical and Industrial Applications

Rationale: Radioisotope products are basic to several applications. The potential for the expansion of radioisotope applications and of increasing the benefits to developing countries continues to be high. Interest in establishing medical cyclotrons for radioisotope production is growing in many developing countries. For centres which do not have cyclotrons, the use of generator systems can be a method of deriving the benefits of PET in clinical practice. For centres which do have a cyclotron devoted to PET radioisotope production, other interesting diagnostic agents can be produced with low/medium energy cyclotrons. While the use of the popular product F-18 fluorodeoxyglucose (FDG) covers most of the PET applications, efforts to develop and introduce other PET tracers, including the development and use of Ge-68–Ga-68 and other generator systems for metabolic and molecular imaging, are being actively pursued. There is a need for the development of cost effective process modules for the more important radionuclides and their labelled compounds. Support is needed to enhance the utilization of cyclotron and national radioisotope processing facilities, particularly for R&D activities driven by the needs of the medical sector.

In the area of radionuclide therapy, the emphasis will be on the products of lutetium-177, following on the Agency's efforts in recent years in evaluating a number of products and, in collaboration with the Human Health programme, for their possible deployment for clinical use. Development support for the reliable production of therapeutic radionuclides of adequate specific activity and high purity and carrier molecules for targeted therapy is essential. Activities to foster the development of practical therapeutic radiopharmaceutical products will be pursued and one new project on cost effective radiopharmaceutical development will complement a project in the Human Health programme on clinical applications.

In collaboration with the subprogramme on research reactors support is envisaged for the development of methods for the local production of molybdenum-99 using LEU targets for chromatographic Technetium-99m generators and neutron activation of molybdenum oxide targets for technetium-99m gel generators.

The Agency's role in capacity building in the utilization of radioisotope products is well known, and most developing Member States and emerging market countries look forward to the guidance and recommendations resulting from Agency's contributions. It would be therefore appropriate to foster the development of promising radioisotope products and techniques in selected areas to enhance the capability for development of radioisotopes and radiopharmaceuticals using indigenous resources, while continuing to support technology transfer of established ones through TC projects.

Objective: To enable Member States to benefit from radioisotope products by strengthening national capability to establish the necessary infrastructure and qualified personnel.

Outcome	Performance Indicator
— Local availability and use of radioisotope products and radiopharmaceuticals for medical, industrial and other applications in interested Member States.	— Number of Member State laboratories utilizing the methodologies developed or improved for radioisotopes and radiopharmaceuticals.

Programmatic changes and trends: QA/QC activities based on ISO 17025 standards were implemented in nuclear analytical laboratories and several Member States have obtained national accreditation. These activities will be phased out of regular budget activities. Support to TC projects will continue to be available.

Activities to foster the development of diagnostic radiopharmaceutical products will be pursued in close collaboration with the Human Health programme. Also, a complementary project with the programme on developing cost effective therapeutic radiopharmaceuticals is planned.

Activities related to radioanalytical techniques are merged into Project 2.5.2.4 on strengthening capabilities for detection of explosives and illicit materials and compositional analysis.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect a decrease of 12.1% (€109 049) in 2008 as compared with 2007, and an increase of 1.8% (€14 000) in 2009 as compared with 2008. The decrease in 2008 results mainly from the transfer of the remaining activities related to radioanalytical techniques to Project 2.5.2.4.

2.5.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	813 134	827 539
Extrabudgetary	—	—
Unfunded	—	36 000

Projects

Title, duration and priority	Main outputs
2.5.1.1 Fostering the development of emerging radioisotopes and generators for medical and industrial applications. ***Duration:*** 2004–2013 ***Priority:*** 1	Technical report covering methodologies and standard procedures for the production and QC of radioisotopes and radionuclide generators from nuclear reactors and cyclotrons; better targetry for liquid and gas irradiation in cyclotrons.
2.5.1.2 Development, production and quality control of emerging diagnostic radiopharmaceuticals ***Duration:*** 2007–2013 ***Priority:*** 1	Methodologies and protocols for the development and production of F-18 labelled products; report on specific radiopharmaceuticals for imaging cancer and movement disorder; guidelines for QA and good manufacturing practices; publication of CRP results/findings.
2.5.1.3 Cost-effective radiopharmaceuticals: development (complementary project to Human Health project 2.2.2.4) ***Duration:*** 2006–2012 ***Priority:*** 1	Guidebook and methodologies for the development and production of therapeutic radiopharmaceuticals for clinical practice; publication of CRP results/findings.

Subprogramme 2.5.2 Radiation technology support for cleaner industrial processes and material analysis and development

Rationale: The application of radioisotopes and radiation techniques in many areas of industrial process management and in dealing with environmental pollutants is vital for sustainable development, both in developed and developing countries. In particular, industrial growth in emerging economies and in many developing Member States can be assisted by the use of radiation technologies to monitor/improve performance quality and minimize the environmental effects of emissions and effluents from industries.

Radiation technology utilizing gamma or X ray sources and electron accelerators is one of the cleaner and more reliable processes for material modification. There are over 160 gamma industrial irradiators and more than 1200 electron industrial accelerators in operation worldwide. These facilities are being widely used for sterilization, food irradiation and polymer/rubber processing. More than 40 pilot and industrial scale Co-60 gamma irradiators, as well as several electron accelerators, have been established in developing Member States with the cooperation of the Agency.

Radiation processing has shown promise in dealing with a number of pollutants. In view of the hazards of known organic pollutants and the difficulties in conventional treatment methods, interest is growing in the applicability of radiation based techniques.

For example, the radiation treatment of low value and/or waste agricultural by-products based on natural polymers remains an active area of development to produce useful products. Radiation processing is also a promising method for the development of novel advanced materials such as polymeric nano-composite coatings with enhanced surface mechanical properties with greater transparency, scratch and abrasion resistance.

Many industrial processes can achieve better control of production, improve efficiency, and enhance product quality and yield by using radiotracer and sealed source techniques. These techniques can also be used by other users and service providers if they are available as user friendly systems. In addition, research activities in areas not dominated by industrial ventures and which enhance the capabilities for the development of products and services using indigenous resources are strongly needed. In the area of well established industrial applications, including NDT, developing Member States require guidelines and training materials on standardized procedures/protocols.

The development of nuclear techniques, particularly those based on neutrons, and making use of multi-technique devices for the detection of explosives and other illicit material will strengthen measures for ensuring the safety and security of people and places.

The emphasis in this subprogramme will be on strengthening national capabilities and assisting national institutions to achieve self-sustainability in radiation technologies. This includes assistance in building up infrastructure, expertise and the knowledge base utilizing and expanding radiation technology applications in developing Member States.

Objective: To strengthen national capabilities of Member States to benefit from radiation technology and radioisotope applications in tackling pollutants, development of value added products, better control of production processes and industrial safety, and detection of hazardous materials.	
Outcome	**Performance Indicator**
— Knowledge base and expertise of interested Member States enriched in the application of radiation technology and nuclear techniques in tackling pollutants, processing value added materials, compositional analysis and improvement of industrial process safety and efficiency.	— Number of Member State laboratories utilizing the methodologies developed/improved for radiation processing, compositional analysis and industrial applications of radioisotope techniques.

Programmatic changes and trends: In the area of radiation processing, the programme will be focused more on new developments in such areas as remediation of environmental pollutants, value addition to local natural materials and synthesis of nanomaterials. Activities related to radioanalytical techniques have been merged into "Project 2.5.2.4, Strengthening Capabilities for Detection of Explosives and Illicit Materials and Compositional Analysis". Continuing NDT activities have been merged into the project on supporting industrial process management using radioisotope and radiation techniques.

Resource changes and trends: The proposed regular budget resource requirements, in real terms, reflect an increase of 3.2% (€34 831) in 2008 as compared with 2007, and a decrease of 1.2% (€14 000) in 2009 as compared with 2008. The increase in 2008 reflects the strengthening of activities in the area of radiation processing for advanced materials development, remediation of pollutants and transfer of activities related to radioanalytical techniques to Project 2.5.2.4.

Efficiency gains have been achieved as a result of focusing research activities on areas where the comparative advantages of radiation technology can make a significant difference in Member States, such as radiation processing of advanced materials and remediation of organic pollutants.

2.5.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 155 922	1 141 481
Extrabudgetary	—	—
Unfunded	—	60 000

Projects

Title, duration and priority	Main outputs
2.5.2.1 Support to improve industrial process management using radioisotope and radiation techniques ***Duration:*** 2004–2013 ***Priority:*** 2	Manuals, training materials and procedures for radioisotope and radiation applications in industrial process management in developing Member States.
2.5.2.2 Radiation technology for advanced materials development ***Duration:*** 2007–2013 ***Priority:*** 1	Methodologies and standard procedures for the application radiation processing techniques in the development of value added products and nanomaterials; publication of CRP results/findings.

Title, duration and priority	Main outputs
2.5.2.3 Remediation of pollutants using radiation technology ***Duration:*** 2005–2013 ***Priority:*** 1	Procedures on the application of radiation processing techniques in the treatment of pollutants; personnel trained for radiation technology; publication of CRP results/finding.
2.5.2.4 Strengthening capabilities for detection of explosives and illicit materials and for compositional analysis. ***Duration:*** 2004–2012 ***Priority:*** 2	Publications on utilization of nuclear techniques for the detection of explosives and illicit materials; and non-destructive examination of valuable artefacts or other materials.

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 14

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
2.0.0.1	Overall Management, Coordination and Common Activities	903 350	-	-	900 629	-	-
		903 350	-	-	**900 629**	-	-
2.1.1.1	Soil Management and Conservation for Sustainable Agriculture and Environment	696 512	143 145	123 000	678 582	123 145	158 000
2.1.1.2	Technologies and practices for sustainable use and management of water in agriculture	1 275 646	90 392	-	1 208 976	90 392	70 000
2.1.1.3	Increasing Competitiveness and Nutritional Properties of High Yielding Crops	947 070	137 828	-	951 813	137 828	70 000
2.1.1.4	Integrated Technologies to Enhance Application and Efficiency of Mutation Induction in Crop Breeding and Genetic Research	708 276	256 498	50 000	657 076	256 498	105 000
2.1.1.5	Integrated Soil-Plant Approaches to Increase Crop Productivity in Harsh Environments	1 139 170	145 043	30 000	1 155 341	145 043	224 000
	Subprogramme 2.1.1 - Sustainable Intensification of Crop Production Systems	**4 766 674**	**772 906**	**203 000**	**4 651 788**	**752 906**	**627 000**
2.1.2.1	Integrated management of animal nutrition, reproduction and health	313 307	91 309	130 000	264 031	71 309	90 000
2.1.2.2	Reducing risk from transboundary animal diseases (TADs) and those of zoonotic importance	981 410	146 693	85 000	849 130	146 693	20 000
2.1.2.3	Molecular technologies for improving productivity in small-holder livestock systems	978 786	103 971	215 000	1 105 973	103 971	-
	Subprogramme 2.1.2 - Sustainable Intensification of Livestock Production Systems	**2 273 503**	**341 973**	**430 000**	**2 219 134**	**321 973**	**110 000**
2.1.3.1	Irradiation and Agricultural Countermeasures for Food Safety and Trade	360 850	241 102	-	577 271	221 102	-
2.1.3.2	Integrated Control of Food and Environmental Hazards	1 323 458	391 950	30 000	1 428 783	471 950	70 000
	Subprogramme 2.1.3 - Improving Food and Environmental Safety	**1 684 308**	**633 052**	**30 000**	**2 006 054**	**693 052**	**70 000**
2.1.4.1	SIT to control exotic insect plant pests of agriculture and the environment	1 037 287	205 419	-	1 089 948	185 419	40 000
2.1.4.2	Area-wide suppression of native insect plant pests to reduce insecticide use and facilitate international trade	968 831	122 426	150 000	870 240	122 426	55 000
2.1.4.3	Strengthening capacities to use SIT in area-wide control of tsetse and screwworm populations	1 468 882	146 491	-	1 365 289	146 491	330 000
	Subprogramme 2.1.4 - Sustainable control of major insect pests	**3 475 000**	**474 336**	**150 000**	**3 325 477**	**454 336**	**425 000**
Programme 2.1 - Food and Agriculture		**12 199 485**	**2 222 267**	**813 000**	**12 202 453**	**2 222 267**	**1 232 000**
2.2.1.1	Combating the double burden of malnutrition	775 417	-	-	780 082	-	-
2.2.1.2	Sustainable strategies to combat micronutrient deficiencies	429 658	-	-	416 008	-	-
2.2.1.3	Nuclear Techniques in the Prevention and Control of HIV/AIDS and other Infectious Diseases	590 509	-	-	648 156	-	-
2.2.1.4	Development of the Sterile Insect Technique (SIT) for the Control of Malaria Transmitting Mosquitoes	482 633	-	250 000	482 645	150 000	150 000
2.2.1.5	Health Effects of Environmental and Other Whole-Body Irradiations	15 381	-	-	15 381	-	-

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Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 14

	Project / Subprogramme / Programme	2008			2009		
		Regular Budget at 2008 prices	Extra-budgetary a_/	CAURBs Unfunded	Regular Budget at 2008 prices	Extra-budgetary a_/	CAURBs Unfunded
2.2.1.6	Radiation Sterilisation to Improve Tissue Banking	22 635	-	-	22 635	-	-
	Subprogramme 2.2.1 - Nutrition and Infectious Disease Prevention and Control	**2 316 233**	**-**	**250 000**	**2 364 907**	**150 000**	**150 000**
2.2.2.1	Strengthening the use of Nuclear Medicine in the Management of Cardiovascular and Coronary Artery Disease	428 415	-	-	388 916	-	-
2.2.2.2	Application of Positron Emission Tomography (PET) and Molecular in vitro Techniques for Cancer and Cardiac Diseases Management	475 524	-	-	463 911	-	-
2.2.2.3	Nuclear Medicine in Non-communicable and Communicable Diseases including Quality Assurance of Clinical Practice	263 286	-	-	351 220	-	80 000
2.2.2.4	Cost-Effective Radiopharmaceuticals: Clinical Applications (complementary project to Radioisotope Production and Radiation Technology Programme 2.5.1.3)	403 253	-	-	384 134	-	-
	Subprogramme 2.2.2 - Nuclear Medicine and Diagnostic Imaging	**1 570 478**	**-**	**-**	**1 588 181**	**-**	**80 000**
2.2.3.1	Palliative Cancer Management Using Radiotherapy	524 741	-	30 352	578 600	-	34 836
2.2.3.2	Curative Cancer Management Using Radiotherapy	655 227	-	60 703	609 861	-	69 670
2.2.3.3	Advanced techniques for cancer radiotherapy	398 125	-	111 203	389 847	-	99 670
2.2.3.4	Therapeutic Applications of Unsealed radioactive Sources in the Management of Benign and Malignant Diseases	205 493	-	-	138 973	-	-
	Subprogramme 2.2.3 - Radiation Oncology and Cancer Treatment	**1 783 586**	**-**	**202 258**	**1 717 281**	**-**	**204 176**
2.2.4.1	Quality Audits in Dosimetry for Radiation Medicine	471 509	-	-	479 131	-	40 000
2.2.4.2	Radiation Metrology Supporting the Network of Secondary Standards Dosimetry Laboratories	678 725	-	-	667 448	-	-
2.2.4.3	Quality Assurance and Guidelines for Medical Physics in the Optimization of Clinical Radiation Imaging	562 219	-	-	596 282	-	-
2.2.4.4	Quality Assurance and Medical Physics Developments in Radiotherapy and Therapeutic Nuclear Medicine	630 350	-	-	601 787	-	-
	Subprogramme 2.2.4 - Quality Assurance and Metrology in Radiation Medicine	**2 342 803**	**-**	**-**	**2 344 648**	**-**	**40 000**
2.2.5.1	Developing tools and fielding review missions upon request to assess Member States needs for cancer control planning (imPACT Missions)	117 435	182 557	87 500	116 972	182 557	87 500
2.2.5.2	Establishing, coordinating and evaluating PACT Model Demonstration Sites	117 635	280 924	125 000	117 836	280 924	125 000
2.2.5.3	Developing strategies for public-private partnerships and fundraising for low resource countries	266 119	224 091	125 000	266 387	224 091	125 000
2.2.5.4	Developing Regional Cancer Training Networks	116 033	108 882	102 500	116 033	108 882	102 500
	Subprogramme 2.2.5 - Programme of Action for Cancer Therapy (PACT)	**617 222**	**796 454**	**440 000**	**617 228**	**796 454**	**440 000**
Programme 2.2 - Human Health		**8 630 322**	**796 454**	**892 258**	**8 632 245**	**946 454**	**914 176**
2.3.1.1	Exchange of information, training and cooperation with international organizations in isotope hydrology	308 638	-	-	286 779	-	-

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 14

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
2.3.1.2	Support to Member States for the management of national and transboundary groundwater resources	345 214	-	-	357 466	-	-
	Subprogramme 2.3.1 - Sustainable Water Use and Services	**653 852**	**-**	**-**	**644 245**	**-**	**-**
2.3.2.1	Isotope Methods for the Assessment of Groundwater Sustainability	675 225	-	-	678 720	-	-
2.3.2.2	Development of isotope methodologies for water quality assessment and management	390 179	-	-	400 247	-	-
2.3.2.3	Isotope Methods for the Study of Water and Carbon Cycle Dynamics in the Atmosphere and Biosphere	323 645	-	-	319 542	-	-
	Subprogramme 2.3.2 - Isotope Methods for the Improved Understanding of the Water Cycle	**1 389 049**	**-**	**-**	**1 398 509**	**-**	**-**
2.3.3.1	Development of member State capacity for isotope analysis of hydrological samples	1 022 042	-	-	1 022 082	-	-
2.3.3.2	Development of helium isotope applications for water resources management	321 534	-	-	321 542	-	-
	Subprogramme 2.3.3 - Analytical Services for Isotope Hydrology	**1 343 576**	**-**	**-**	**1 343 624**	**-**	**-**
Programme 2.3 - Water Resources		**3 386 477**	**-**	**-**	**3 386 378**	**-**	**-**
2.4.1.1	Measurement and Assessment of Natural and Anthropogenic Radionuclides in the Marine Environment	679 350	47 196	-	679 349	47 196	-
2.4.1.2	Diagnosing Contaminant Sources and Fates Using Nuclear and Isotopic Techniques	237 780	428 596	415 000	222 290	428 596	-
2.4.1.3	Quality Management for Monitoring Marine Contaminants and Toxins	285 924	36 150	-	282 816	36 150	-
2.4.1.4	Novel Methods for Measuring Low Level Radionuclide Concentrations in Marine Samples	409 364	22 904	-	404 184	22 904	-
	Subprogramme 2.4.1 - Marine Environmental and Radiological Assessment (MERA)	**1 612 418**	**534 846**	**415 000**	**1 588 639**	**534 846**	**-**
2.4.2.1	Nuclear and Isotopic Studies of Marine Coastal Zone Dynamics	286 372	-	-	283 264	-	-
2.4.2.2	Bioaccumulation and Transfer of Radionuclides in Coastal Environments	237 127	7 420	-	237 127	7 420	-
2.4.2.3	Tracing Harmful Algal Blooms (HAB) Toxins and Contaminants in Seafood with Nuclear-Based Techniques	589 178	22 263	-	657 755	22 263	-
2.4.2.4	Investigations of Marine Ecotoxicological Impacts Using Nuclear-Based Techniques	228 678	7 420	-	224 875	7 420	-
	Subprogramme 2.4.2 - Radioecological and Isotopic Solutions for Coastal Marine Problems (RISCMAR)	**1 341 355**	**37 103**	**-**	**1 403 021**	**37 103**	**-**
2.4.3.1	Isotopic Studies of Nutrient Dynamics and Algal Blooms	132 217	90 943	-	116 677	90 943	-
2.4.3.2	Nuclear and Isotopic Applications to Quantify Ocean Carbon Cycling	232 852	36 150	-	232 852	36 150	380 000
2.4.3.3	Marine Isotopic Records and Models to Assess Climate Change	282 925	-	-	259 962	-	-
	Subprogramme 2.4.3 - Ocean Climate Coupling and Carbon Cycling (OC4)	**647 994**	**127 093**	**-**	**609 491**	**127 093**	**380 000**

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 14

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
2.4.4.1	Laboratory Quality Management Activities and Metrology	438 068	-	-	438 081	-	-
2.4.4.2	Reference Materials for Terrestrial Environments	311 587	-	-	311 604	-	-
2.4.4.3	Agency Network of Laboratories for Measuring Radionuclides in the Environment (ALMERA)	213 878	-	-	213 890	-	-
2.4.4.4	IAEA Reference Materials for Environment and Trade	87 963	-	-	87 968	-	-
	Subprogramme 2.4.4 - Supporting Analytical Laboratory Performance	**1 051 496**	**-**	**-**	**1 051 543**	**-**	**-**
2.4.5.1	Terrestrial Radioecology	359 620	-	-	359 630	-	150 000
2.4.5.2	Ecotoxicology	204 748	-	-	204 760	-	-
2.4.5.3	Remediation strategies	187 564	-	-	187 574	-	-
	Subprogramme 2.4.5 - Sustainable Management of the Terrestrial Environment	**751 932**	**-**	**-**	**751 964**	**-**	**150 000**
Programme 2.4 - Environment		**5 405 195**	**699 042**	**415 000**	**5 404 658**	**699 042**	**530 000**
2.5.1.1	Fostering the development of emerging radioisotopes and generators for medical and industrial applications.	261 976	-	-	291 756	-	-
2.5.1.2	Development, Production and Quality Control of Emerging Diagnostic Radiopharmaceuticals	238 945	-	-	282 036	-	36 000
2.5.1.3	Cost-Effective Radiopharmaceuticals: Development (Complementary project to Human Health project 2.2.2.4)	312 213	-	-	253 747	-	-
	Subprogramme 2.5.1 - Development of Radioisotope Products for Medical and Industrial Applications	**813 134**	**-**	**-**	**827 539**	**-**	**36 000**
2.5.2.1	Support to improve industrial process management using radioisotope and radiation techniques.	340 822	-	-	307 950	-	60 000
2.5.2.2	Radiation technology for advanced materials development	371 152	-	-	389 619	-	-
2.5.2.3	Remediation of pollutants using radiation technology	227 141	-	-	264 237	-	-
2.5.2.4	Strengthening capabilities for detection of explosives and illicit materials and for compositional analysis.	216 807	-	-	179 675	-	-
	Subprogramme 2.5.2 - Radiation technology support for cleaner industrial processes and material analysis and development	**1 155 922**	**-**	**-**	**1 141 481**	**-**	**60 000**
Programme 2.5 - Radioisotope Production and Radiation Technology		**1 969 056**	**-**	**-**	**1 969 020**	**-**	**96 000**
Major Programme 2 - Nuclear Techniques for Development and Environmental Protection		**32 493 885**	**3 717 763**	**2 120 258**	**32 495 383**	**3 867 763**	**2 772 176**

a_/ Includes funds from other UN organizations - see Tables 3A and 3B for details.

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Core Activities Unfunded in the Regular Budget

Table 15

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
2.1.1.1	Soil Management and Conservation for Sustainable Agriculture and Environment		
2.1.1.1/05	*Plan and coordinate a CRP on evaluation of no-till and conventional conservation practices on the production of maize- and sorghum-based cropping systems in Africa (2009-2013).*	-	120 000
2.1.1.1/07	*Assess the effects of soil pollution on crop production in greenhouses and the use of recycled organic wastes for increased vegetable production (2008-2009).*	38 000	38 000
2.1.1.1	*Updated laboratory equipment for more efficient project implementation.*	85 000	-
2.1.1.2	Technologies and practices for sustainable use and management of water in agriculture		
2.1.1.2	*Updated laboratory equipment for more efficient project implementation.*	-	70 000
2.1.1.3	Increasing Competitiveness and Nutritional Properties of High Yielding Crops		
2.1.1.3	*Updated laboratory equipment for more efficient project implementation.*	-	70 000
2.1.1.4	Integrated Technologies to Enhance Application and Efficiency of Mutation Induction in Crop Breeding and Genetic Research		
2.1.1.4/05	*Develop resources for banana and cassava improvement and genetics research.*	25 000	25 000
2.1.1.4	*Updated laboratory equipment for more efficient project implementation.*	25 000	80 000
2.1.1.5	Integrated Soil-Plant Approaches to Increase Crop Productivity in Harsh Environments		
2.1.1.5/11	*Coordinate a research project on Sustainable Productivity and Quality Enhancement of Mutant Crop Varieties as Affected by Soil Quality (2008-2014).*	-	129 000
2.1.1.5/15	*Organize regional working group meetings on integrated nuclear techniques, mutation induction and supportive biotechnologies for food production.*	30 000	30 000
2.1.1.5	*Updated laboratory equipment for more efficient project implementation.*	-	65 000
	Subprogramme 2.1.1 - Sustainable Intensification of Crop Production Systems	203 000	627 000
2.1.2.1	Integrated management of animal nutrition, reproduction and health		
2.1.2.1/05	*Coordinate a CRP on a holistic method to optimize the usage of available soil nutrients and water resources and to select and improve, through mutational breeding and molecular biology, the nutritional value of animal feed (2008 – 2013).*	130 000	90 000
2.1.2.2	Reducing risk from transboundary animal diseases (TADs) and those of zoonotic importance		
2.1.2.2	*Updated laboratory equipment for more efficient project implementation.*	85 000	20 000
2.1.2.3	Molecular technologies for improving productivity in small-holder livestock systems		
2.1.2.3	*Updated laboratory equipment for more efficient project implementation.*	215 000	-
	Subprogramme 2.1.2 - Sustainable Intensification of Livestock Production Systems	430 000	110 000
2.1.3.2	Integrated Control of Food and Environmental Hazards		
2.1.3.2	*Updated laboratory equipment for more efficient project implementation.*	30 000	70 000
	Subprogramme 2.1.3 - Improving Food and Environmental Safety	30 000	70 000
2.1.4.1	SIT to control exotic insect plant pests of agriculture and the environment		
2.1.4.1	*Updated laboratory equipment for more efficient project implementation.*	-	40 000

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Core Activities Unfunded in the Regular Budget

Table 15

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
2.1.4.2	Area-wide suppression of native insect plant pests to reduce insecticide use and facilitate international trade		
2.1.4.2	*Updated laboratory equipment for more efficient project implementation.*	150 000	55 000
2.1.4.3	Strengthening capacities to use SIT in area-wide control of tsetse and screwworm populations		
2.1.4.3	*Updated laboratory equipment for more efficient project implementation.*	-	330 000
	Subprogramme 2.1.4 - Sustainable control of major insect pests	150 000	425 000
Programme 2.1 - Food and Agriculture		**813 000**	**1 232 000**
2.2.1.4	Development of the Sterile Insect Technique (SIT) for the Control of Malaria Transmitting Mosquitoes		
2.2.1.4/09	*Coordinate a CRP on post-release biology of An. arabiensis (2008-2012).*	50 000	-
2.2.1.4	*Updated laboratory equipment for more efficient project implementation.*	200 000	150 000
	Subprogramme 2.2.1 - Nutrition and Infectious Disease Prevention and Control	250 000	150 000
2.2.2.3	Nuclear Medicine in Non-communicable and Communicable Diseases including Quality Assurance of Clinical Practice		
2.2.2.3/06	*Coordinate a CRP on the role of nuclear medicine in the early diagnosis of movement disorders (2009-2012) (in conjunction with 2.5.1.2 for development).*	-	80 000
	Subprogramme 2.2.2 - Nuclear Medicine and Diagnostic Imaging	-	80 000
2.2.3.1	Palliative Cancer Management Using Radiotherapy		
2.2.3.1	Additional human resources needed for TC programme support	30 352	34 836
2.2.3.2	Curative Cancer Management Using Radiotherapy		
2.2.3.2	Additional human resources needed for TC programme support	60 703	69 670
2.2.3.3	Advanced techniques for cancer radiotherapy		
2.2.3.3/07	*Coordinate a CRP on Improving outcomes in radiotherapy using novel biotechnologies: modification of tissue reactions and the use of stem cell therapeutics (2008-2011).*	50 500	30 000
2.2.3.3	Additional human resources needed for TC programme support	60 703	69 670
	Subprogramme 2.2.3 - Radiation Oncology and Cancer Treatment	202 258	204 176
2.2.4.1	Quality Audits in Dosimetry for Radiation Medicine		
2.2.4.1/07	*Coordinate a CRP on development of quality audits for radiotherapy dosimetry for complex treatment techniques (2009-2011) (in conjunction with 2.2.3.2).*	-	40 000
	Subprogramme 2.2.4 - Quality Assurance and Metrology in Radiation Medicine	-	40 000
2.2.5.1	Developing tools and fielding review missions upon request to assess Member States needs for cancer control planning (imPACT Missions)		
2.2.5.1	*Expertise and travel costs associated with field visits to review existing infrastructure for country case studies.*	87 500	87 500
2.2.5.2	Establishing, coordinating and evaluating PACT Model Demonstration Sites		
2.2.5.2	Expertise and related travel costs to execute the six Model Demonstration Sites.	125 000	125 000
2.2.5.3	Developing strategies for public-private partnerships and fundraising in low resource countries		
2.2.5.3	*Develop a joint strategy and joint funding proposals together with PACT inter Agency partners for each PACT model demonstration site.*	125 000	125 000

Major Programme 2 - Nuclear Techniques for Development and Environmental Protection

Core Activities Unfunded in the Regular Budget

Table 15

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
2.2.5.4	Developing Regional Cancer Training Networks		
2.2.5.4/4	*Develop a global guide, starting with Africa, for evaluating and improving existing training programs in low and middle income countries.*	102 500	102 500
	Subprogramme 2.2.5 - Programme of Action for Cancer Therapy (PACT)	440 000	440 000
Programme 2.2 - Human Health		**892 258**	**914 176**
2.4.1.2	Diagnosing Contaminant Sources and Fates Using Nuclear and Isotopic Techniques		
2.4.1.2/05	*Updated laboratory equipment for organometallic speciation .*	415 000	-
	Subprogramme 2.4.1 - Marine Environmental and Radiological Assessment (MERA)	415 000	-
2.4.3.2	Nuclear and Isotopic Applications to Quantify Ocean Carbon Cycling		
2.4.3.2/03	*Updated laboratory equipment for characterizing sinking particulate organic carbon in coastal regions.*	-	380 000
	Subprogramme 2.4.3 - Ocean Climate Coupling and Carbon Cycling (OC4)	-	380 000
2.4.5.1	Terrestrial Radioecology		
2.4.5.1	*Updated laboratory equipment for more efficient project implementation.*	-	150 000
	Subprogramme 2.4.5 - Sustainable Management of the Terrestrial Environment	-	150 000
Programme 2.4 - Environment		**415 000**	**530 000**
2.5.1.2	Development, Production and Quality Control of Emerging Diagnostic Radiopharmaceuticals		
2.5.1.2/03	*Coordinate a CRP on development of F-18 labelled radiopharmaceuticals other than FDG, (such as F-DOPA, Fluorothymidine, Flourotyrosine) (2009-2013).*	-	36 000
	Subprogramme 2.5.1 - Development of Radioisotope Products for Medical and Industrial Applications	-	36 000
2.5.2.1	Support to improve industrial process management using radioisotope and radiation techniques.		
2.5.2.1/06	*Coordinate a CRP on radiometric methods for measuring and modeling multiphase systems towards process management (2009-2013).*	-	60 000
	Subprogramme 2.5.2 - Radiation technology support for cleaner industrial processes and material analysis and development	-	60 000
Programme 2.5 - Radioisotope Production and Radiation Technology		**-**	**96 000**
Major Programme 2 - Nuclear Techniques for Development and Environmental Protection		**2 120 258**	**2 772 176**

Major Programme 3
Nuclear Safety and Security

Introduction

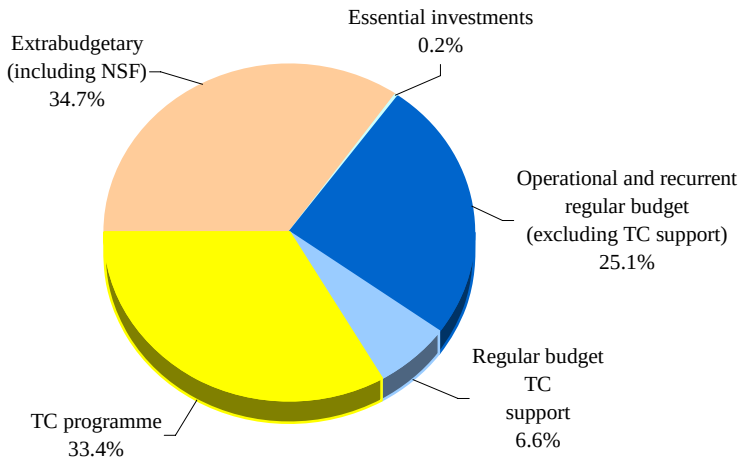
The Agency, through this major programme, represents the core of an international effort to establish a strong, sustainable and visible global safety and security regime that contributes to protecting people and the environment from the harmful effects of ionizing radiation by minimizing the likelihood of accidents, protecting against malicious acts and mitigating the effects of any such events should they occur. Elements of the major programme reflect the Agency's statutory functions of establishing standards of safety and providing for their application to both its own operations and to the activities of States, upon request. The security elements of the programme respond to the requests of Member States for support of their measures to combat the threat of nuclear terrorism. Major Programme 3 is the Agency's programmatic response to Goal B of the Medium Term Strategy 2006–2011, with its three objectives and strategic actions.

The primary driving forces for change are: the impact of globalization; the potential expansion of nuclear power; the long term operation of existing nuclear power plants; the increased emphasis on "leadership" for safety; the increasing and advanced use of nuclear techniques in medical diagnostics and treatment; the increased attention to the protection of the environment; the safe management of radioactive waste; and the continuous threat of nuclear terrorism. Particular emphasis will be placed on those activities relating to the integrated safety approach to identify Member State needs and to identify synergies and ensure that gaps and overlaps in the programmes are avoided. As a principal element of the integrated safety approach, the effectiveness and relevance of regional safety knowledge networks will be assessed. Additional efforts will be oriented to the integration of regional networks into a global nuclear safety knowledge network.

Objectives	Performance Indicators
— To achieve wide subscription of Member States to existing and new international nuclear safety and security instruments.	— Additional number of countries subscribing to legally binding and non-binding international instruments.
— To achieve global acceptance and utilization of the Agency's safety standards and security guidance as a common reference point for the high level of safety and security required in nuclear activities.	— Number of Member States with national regulations making reference to, and are consistent with, the safety standards and security guidelines. — Number of Member States using safety standards and security guidelines as reference material to demonstrate the safety level reported in the relevant conventions and Codes of Conduct.
— To continuously improve nuclear safety and security through elimination of weak links, increase international cooperation, and facilitate the establishment of sustainable knowledge networks.	— Improved capability in Member States to identify and correct safety and security deficiencies. — Increase in the rate of implementation of recommendations of Agency peer reviews. — Number of Member States creating and sharing safety and security knowledge using networks in a sustainable manner.

Outcome	Performance Indicator
— A strengthened global safety and security regime.	— Effective programme delivery as evidenced by Member State statements at the Board of Governors and by General Conference resolutions.

2008–2009 Resources for Nuclear Safety and Security[1]



Programmes	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Overall management, coordination and common activities	913 158	914 176	1 827 334
Incident and Emergency Preparedness and Response	1 429 642	1 410 003	2 839 645
Safety of Nuclear Installations	8 378 811	8 398 312	16 777 123
Radiation and Transport Safety	5 359 314	5 359 052	10 718 366
Management of Radioactive Waste	6 327 422	6 327 751	12 655 173
Nuclear Security	1 107 381	1 107 380	2 214 761
Operational and recurrent regular budget	23 515 728	23 516 674	47 032 402
Essential investments	210 000	110 000	320 000
Total regular budget	**23 725 728**	**23 626 674**	**47 352 402**
Extrabudgetary including NSF	26 239 150	25 422 532	51 661 682
TC programme	24 010 900	25 649 900	49 660 800
Total resources	**73 975 778**	**74 699 106**	**148 674 884**

[1] Excludes unfunded activities of €513 000.

3.0.0.1 Overall management, coordination and common activities

Description	Main outputs
Through this project support and coordination are provided for the programmes, ensuring that the Agency's standards constitute a comprehensive, coherent and authoritative suite of internationally accepted safety standards of excellence; supporting integrated approaches to their application; and promoting the networking of information and knowledge. The synergies of the safety and security aspects of the programmes will also be enhanced.	Efficient and effective programme delivery; publication of safety standards and security guidelines; establishment of sustainable networks for sharing safety knowledge within the Agency and with Member States.

3.0.0.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	913 158	914 176
Extrabudgetary	2 621 943	2 621 943
Unfunded	—	—

Programme 3.1 Incident and Emergency Preparedness and Response

Rationale: Effective national and global response capabilities are essential to minimize the impacts from nuclear and radiological incidents and emergencies, and to build public trust in the safety and security of nuclear technology. The often discussed expansion in the use of nuclear energy cannot occur without enhanced national, regional and international capabilities to respond to an incident or emergency. Moreover, increased concern over the use of nuclear or radioactive materials for malicious purposes increases the need to broaden response capabilities. The Agency's Incident and Emergency Centre (IEC) can help Member States obtain support in dealing with both accidents and security incidents (e.g. seizures at borders, thefts and attempts of or actual sabotage).

While there have been no major nuclear emergencies in the past decade, incidents continue to occur, though most are not well known. In the past five years, the Agency has responded to and coordinated assistance to 113 formally notified events.

Adequate preparedness to respond to nuclear and radiological (radiation) incidents and emergencies is not a capability shared by everyone. The provision of technical assistance, sharing information from past events, development of effective international arrangements for sharing official, technical and public information, as well as frequent exercises, will benefit authorities, planners and responders at the national, regional and international levels. An effective response to incidents and emergencies requires a coherent initial assessment followed by crisis and consequence management, all of which can only be achieved through coordinated and effective preparedness and response arrangements involving all relevant authorities and response organizations.

Objective: To establish effective and compatible national, regional and international capabilities and arrangements for preparedness, early warning, timely response to actual, potential or perceived nuclear or radiological incidents and emergencies independent of whether incident or emergency arises from an accident, negligence or a deliberate act, and for sharing official, technical and public information among Member States and relevant international organizations.

Outcomes	Performance Indicators
— Adequate preparedness and response programmes at national, regional and international level.	— Timeliness of response to radiation incidents or emergencies.
— Effective provision/sharing of information.	— Increase in the level of information shared on incidents and emergencies.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: This programme is based on the role assigned to the Agency by the Convention on Early Notification of a Nuclear Accident (the Early Notification Convention), the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention), the emergency response role for the Agency identified in the revised Convention on the Physical Protection of Nuclear Material as well as relevant General Conference resolutions, oversight authority recommendations, and the Board approved Nuclear Security Plan for 2006–2009.

3.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 429 642	1 410 003
Extrabudgetary	1 226 389	1 262 225
Unfunded	230 000	130 000

Specific criteria for prioritization:

1. First priority is given to activities necessary to fulfil the Early Notification and Assistance Conventions.
2. Second priority is given to activities enhancing preparedness for responding to radiation incidents and emergencies.
3. Third priority is given to activities enhancing arrangements with other relevant international organizations.

Subprogramme 3.1.1 Enhancing Member State Preparedness and Response Capabilities

Rationale: The Early Notification and the Assistance Conventions place specific functions on the Agency with regard to assisting Member States with the development, strengthening and harmonization of preparedness arrangements and capabilities. There is a continuing trend to make the Agency's operational standards, practical guidance and tools (including training material and services), and arrangements for communications and assistance coherent across all types of actual and potential nuclear/radiological incidents and emergencies — independent of their cause. There is also a need to achieve adequate and uniform communication standards for incidents and emergencies worldwide, including information exchange for incidents that have little consequence but that may have safety or security implications or can attract considerable media and public interest.

Objective: To strengthen incident and emergency preparedness and response arrangements and capabilities including harmonized communication system in States and regions together with arrangements for feedback and continuous improvement.

Outcomes	**Performance Indicators**
— Improved and harmonized national and regional preparedness and response arrangements and capabilities.	— Level of preparedness for response in Member States and regions.
— Effective communications and sharing of information/experience in preparedness and response.	— Extent of increase in global communications and sharing of information/experience.

Programmatic changes and trends: This is a new subprogramme developed on the basis of lessons learned and needs identified through the assessment and evaluation of global emergency preparedness and response activities performed in the framework of the International Action Plan for Strengthening the International Emergency Preparedness and Response System for Nuclear and Radiological Emergencies.

Resource changes and trends: The proposed resources, in real terms, reflect an increase of 34.6% (€178 799) in 2008 as compared to similar activities conducted in 2007 under other subprogrammes and a slight increase in 2009 as compared with 2008. To build a sustainable incident and emergency system that fully meets the needs of Member States, investment in additional human resources, equipment and maintenance is required. An increase in the regular budget is needed in order to decrease dependence on extrabudgetary contributions. Additional funds have been requested as essential investments to improve the infrastructure of the IEC, for which details can be found in the Overview.

3.1.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	714 915	729 900
Extrabudgetary	663 186	663 186
Unfunded	34 485	28 000

Projects

Title, duration and priority	Main outputs
3.1.1.1 Enhancing national and regional preparedness for responding to radiation incidents and emergencies ***Duration:*** 2008–2009 ***Priority:*** 1	Operational standards, guidelines and tools; advice and appraisal services (EPREV missions); training in emergency preparedness and response.
3.1.1.2 Enhancing arrangements for incident and emergency reporting and knowledge sharing ***Duration:*** 2008–2009 ***Priority:*** 1	Internationally harmonized communication capabilities and arrangements; relevant information on radiation incidents and emergencies made globally available; knowledge management tools and networks for exchange/sharing lessons learned and trends identified; INES Manual, 2008 edition; INES leaflet, 2008 edition.

Subprogramme 3.1.2 Enhancing Preparedness and Response Capabilities of International Organizations

Rationale: The responsibility for responding to radiation incidents and emergencies and for protecting the public, property and the environment remains within the affected State at the local and national level. However, the Early Notification and Assistance Conventions and the Convention on Physical Protection of Nuclear Material, in addition to specific obligations placed on their States Parties, also confer obligations for a response on the Agency. In incidents and emergencies, the Agency has functions related to: (1) the international exchange of real-time information; (2) the prompt provision of advice and assistance; and (3) the timely provision of relevant, accurate and coherent information to the media and public. In order to carry out these functions appropriately, efficiently and promptly, the Secretariat must be adequately prepared. In addition, it should be able to respond with urgency to radiation safety and/or security related requests from Member States, relevant intergovernmental organizations and the media and public.

Although the Conventions assign specific response functions and responsibilities to the Agency and the Parties, various international organizations have — by virtue of their statutory functions or of related legal instruments — general functions and responsibilities that encompass aspects of preparedness and response. The Inter-Agency Committee on Response to Nuclear Accidents (IACRNA), for which the Agency provides the Secretariat, coordinates the preparedness arrangements of the relevant international intergovernmental organizations. Part of this subprogramme covers these obligations and activities.

Objectives:

— To have in place adequate preparedness and response capabilities and arrangements whereby Member States and international organizations can confidently obtain relevant information and assistance and sustainable process for their further and continuous improvement.

— To have in place adequate preparedness and response capabilities and arrangements at the intergovernmental and interagency level and sustainable process for their further and continuous improvement.

Outcomes	Performance Indicators
— Efficient and sustainable emergency management system at the Secretariat level.	— Proficiency of the Secretariat's response to a radiation incident or emergency.
— Efficient and sustainable emergency management system at the intergovernmental and interagency level.	— Level of international preparedness for efficient response to any emergency.

Programmatic changes and trends: This subprogramme represents continuation and consolidation of relevant activities from the preceding two year cycle taking into account global trends and new organizational structure and position of the IEC.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 17% (€101 051) in 2008 as compared with 2007 and a decrease of 4.9% (€33 790) in 2009 as compared with 2008. To build a sustainable emergency management system that fully meets the needs of Member States and relevant international organizations, investment in additional human resources, equipment and maintenance should be made. An increase in the regular budget is needed in order to decrease dependence on extrabudgetary contributions. Additional funds have been requested as essential investments to improve the infrastructure of the IEC, for which details can be found in the Overview. The amounts of €195 515 for 2008 and €102 000 for 2009 for equipment for the IEC remain unfunded as shown in Table 17.

3.1.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	714 727	680 103
Extrabudgetary	563 203	599 039
Unfunded	195 515	102 000

Projects

Title, duration and priority	Main outputs
3.1.2.1 Operating and enhancing the Secretariat's incident and emergency system ***Duration:*** 2008–2009 ***Priority:*** 1	Up to date Secretariat preparedness and response plan and arrangements; Emergency Notification and Assistance Technical Operations Manual (ENATOM), 2008 edition; regular ConvEx-1 and 2 exercise reports; information, advice and assistance in the case of radiation incident or emergency; ConvEx-3 (2008) exercise — internal evaluation report; communication and IT systems with higher performance and reliability; trained Agency staff.
3.1.2.2 Strengthening and enhancing interagency/intergovernmental arrangements ***Duration:*** 2008–2009 ***Priority:*** 1	Joint Plan, 2008 edition; RANET, 2008 edition; report of the meeting of competent authorities identified under the Early Notification and the Assistance Conventions in 2009; two IACRNA meetings reports; report on international exercise ConvEx-3 (2008); scenarios for exercises in Member States and for interagency exercises; international emergency management system.
3.1.2.3 Increasing and sustaining awareness of IEC capabilities, services and products - Strengthening IEC Outreach ***Duration:*** 2008–2009 ***Priority:*** 2	Promotional materials (informational brochures, flyers and posters, presentations, videos, CDs etc.); up to date incident and emergency website; IEC Newsletters; information to media; promulgation of project proposals for extrabudgetary funding.

Programme 3.2 Safety of Nuclear Installations

Rationale: The development of a global safety regime has continued to evolve and mature. The entire nuclear community has recognized the need to share information freely, and thereby ensure that lessons learned at any installation or by any regulatory body can benefit all other members of the community. The much discussed expansion of nuclear power production involves challenges in bringing national codes and licensing processes into convergence. Just as importantly, many countries with nuclear power capabilities have decided that the current fleet of nuclear power plants can be safely and efficiently operated beyond their original design lifetimes. The activities to monitor and ensure the operability of the necessary systems and components have been undertaken by operators, regulatory authorities and vendors.

During this biennium, the Agency will continue to develop and maintain a comprehensive set of safety standards for nuclear installations that can be used by Member States with mature nuclear programmes as well as those beginning to pursue an expanding nuclear power option. Emphasis will be placed on increasing the efficiency of the system and the usability of the standards. Key points to achieving these goals will include:

- Ensuring that they reflect the optimal levels of safety for all types of nuclear installations;
- Integrating risk informed considerations into all aspects of the safety standards;
- Continuing to tailor review services to the individual needs of Member States;
- Emphasizing the use of self-assessments by Member States and operating organizations;
- Addressing the challenges from the changes in operating parameters (plant lifetimes, power uprates) for the current generation of nuclear installations.

Objectives:

— To enable Member States to ensure appropriate levels of safety during the design, construction and operations throughout their total life cycle of all types of nuclear installations through the availability of a set of safety standards and assistance in their applications.

— To enable Member States seeking to embark on nuclear power production programmes to develop appropriate safety infrastructures through the availability of Agency guidance and assistance.

Outcomes	Performance Indicators
— A current and complete set of safety standards, as demonstrated by the promulgation of international standards that reflect the best levels of safety.	— Safety standards promulgated for all types of nuclear installations in accordance with the Safety Standards Action Plan.
— Effectiveness and worldwide application of safety standards as assessed through safety review services and safety assessment missions.	— Percentage of issues associated with safety review services recommendations adequately addressed by Member States. — Number of safety review services completed.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Two principal responses to the review and assessment of this programme are the establishment of the Agency-wide Nuclear Power Support Group, and joint projects which were created for strengthening coordination activities between Major Programme 1, Nuclear Power, Fuel Cycle and Nuclear Science, and this major programme relating to both the safety and technical aspects of nuclear power plant operations with a focus on PLiM/LTO, and management systems and management for safety in 2008–2009.

3.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	8 378 811	8 398 312
Extrabudgetary	3 336 793	2 495 339
Unfunded	—	—

Specific criteria for prioritization:

1. First priority is given to projects establishing standards and servicing conventions.
2. Second priority is given to the projects related to the application of standards.
3. Third priority is given to projects dealing with the strengthening of information exchange.

Subprogramme 3.2.1 National Regulatory Framework and Approaches to Enhance Regulatory Effectiveness

Rationale: The Agency promotes and supports the establishment of a global safety regulatory regime. One objective of this regime is to strengthen the transparency, openness, independence, technical competence and effectiveness of regulatory bodies in Member States. Central to establishing the global safety regulatory regime are the Agency's regulatory safety standards, their application and their review.

The regulatory framework and its associated activities are essential to guarantee a high level of safety of all nuclear facilities and activities under national responsibility. The regulatory bodies are facing new challenges and regulatory and policy issues, and are striving to improve the regulatory infrastructure to adequately control, using a graded approach, all types of nuclear installations. The Agency's new Integrated Regulatory Review Service (IRRS) considers all regulatory aspects in the nuclear facilities and practices and provides a review of regulatory and policy issues facing Member State regulatory bodies.

The importance of international regulatory peer review, and the opportunity it provides to share knowledge and experience of regulatory issues and good practices to improve regulatory effectiveness, was acknowledged and supported by Member States at the Review Meetings of the Contracting Parties to the Convention on Nuclear Safety (CNS) and at the Agency's international conference on Effective Nuclear Regulatory Systems, held in Moscow in 2006. Member State recommendations are the basis for this subprogramme.

Objectives:

— To have transparent, open, independent, technically competent and effective regulatory authorities in place in the Member States, including those planning to develop nuclear programs.

— To enhance capability of Member States to perform self-assessments of the regulatory body and identify regulatory and policy issues as well as the collection and dissemination of regulatory information, regulatory and policy issues, and trends and lessons learned from regulatory bodies by Member States.

Outcomes	Performance Indicators
— Adequate and sustainable regulatory infrastructures in Member States in accordance with Agency safety standards based on the implementation of recommendations and suggestions of Integrated Regulatory Review Services (IRRS).	— Number of IRRS missions requested and percentage of Agency recommendations and suggestions on regulatory improvements adequately addressed by Member States.
— Improved regulatory effectiveness and transparency in Member States through high quality self-assessment in accordance with Agency safety standards.	— Number of documented regulatory body self-assessments and percentage of identified needs for improvements adequately addressed prior to IRRS missions.

Programmatic changes and trends: It is expected that during 2008 and 2009, Member States will carry out more self-assessments of the effectiveness of their regulatory infrastructure, and request peer review of their regulatory infrastructure utilizing IRRS and follow-up missions. The feedback from these services will continue to serve to share best practices among Member States. This feedback will also be used as a basis to begin revision of the safety standards on legal and governmental infrastructure. The integration of the relevant safety standards will provide improved guidance to Member States regarding the implementation of legal and governmental infrastructure requirements. The revised safety standards, in conjunction with the revised IRRS guidelines, will provide for more effective peer reviews of regulatory infrastructures in accordance with Member State requests.

An International Regulatory Experience Sharing Centre will be established to collect, analyse and make available, in a systematic way, regulatory related information, experience, lessons learned, as well as a synopsis of international regulatory issues and trends. The centre will provide essential and effective international regulatory information and provide the opportunity for continuous improvement of regulatory bodies.

Resource changes and trends: The proposed resources reflect a decrease of 7.1% (€62 690) in 2008 as compared with 2007 and an increase of 3.3% (€27 100) in 2009 as compared with 2008 due to the transfer of the Incident Reporting System (IRS) into the operating experience feedback area of Subprogramme 3.2.5, Operational Safety and Effective International Operating Experience Feedback. Data processing requirements as well as general operating expenditures for this purpose were shifted from this subprogramme to Subprogramme 3.2.5.

3.2.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	842 254	869 976
Extrabudgetary	430 460	430 460
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.1.1 Enhancing regulatory effectiveness and independence in Member States ***Duration:*** Recurrent ***Priority:*** 1	Safety Standards: GS-R-1 and related Safety Guides IRRS mission reports as requested by Member States.
3.2.1.2 International Regulatory Experience Sharing Centre ***Duration:*** Recurrent ***Priority:*** 3	Regulatory country profiles.

Subprogramme 3.2.2 National and Global Nuclear Safety Programme Enhancements

Rationale: The global nuclear safety regime is the framework for achieving the worldwide implementation of a high level of nuclear safety at nuclear installations. At its core are the activities undertaken by each Member State to ensure the safety and security of its nuclear installations. However, this must be augmented by the activities of international organizations that facilitate nuclear safety. It includes the development and sustainability of the necessary infrastructure to support a nuclear programme. It is also based on the Agency's safety standards and on international conventions, and is highly dependent on regulatory effectiveness, international information sharing and the promotion of a safety culture.

Objective: To enhance the global nuclear safety regime.

Outcomes	Performance Indicators
— Increased use of the Agency safety standards.	— Percentage of safety standards documents being used by Member States.
— Increased effectiveness of the CNS, and the outreach of the International Nuclear Safety Group (INSAG).	— Results of the meetings of INSAG and CNS.
— Effective implementation of recommendations from safety review services and assistance in the area of management systems.	— Number of recommendations successfully implemented as measured in follow-up missions.
— Effective nuclear safety infrastructure and training.	— Number of enhancements in the area of nuclear safety infrastructure and training.

Programmatic changes and trends: The safety standards will be streamlined in accordance with a new structure decided by the Commission on Safety Standards. The safety review services will be better integrated, providing more comprehensive assessment and assistance to Member States. The integrated safety assessment programme will provide the Agency with a systematic tool by which it can more effectively evaluate the expenditure of resources in support of Member State requests. The management systems programme, including management for safety and safety culture, operated jointly by the Department of Nuclear Safety and Security and the Department of Nuclear Energy, will be coordinated through this subprogramme. Finally, based on an integrated, coordinated Agency effort, a new infrastructure project focused on training in nuclear safety will assist Member States with emerging and mature nuclear programmes.

Resource changes and trends: The proposed resources reflect a decrease of 8.5% (€193 430) in 2008 as compared with 2007 and a 3.7% decrease (€76 880) in 2009 as compared with 2008. The decrease is caused by recording Professional and General Service staff who work on the CNS and education and training in the respective technical areas rather than in Subprogramme 3.2.2, which is a policy and programme support area. Efficiency gains in funding and human resources were achieved by combining safety management and safety culture activities of the Departments of Nuclear Energy and Nuclear Safety and Security under the coordination of Subprogramme 3.2.2. Some short-term professional support staff are now funded from extrabudgetary resources. Efficiency gains due to close cooperation and co-funding with the Department of Nuclear Energy are

also expected for the organization of the Conference on Topical Issues in Nuclear Safety, which will also tie in with the conference on Opportunities and Challenges for Water Reactors in the 21st Century.

3.2.2	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	2 126 122	2 048 457
Extrabudgetary	445 435	430 435
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.2.1 Maintaining and enhancing the quality of the Agency safety standards for the safety of nuclear installations ***Duration:*** Recurrent ***Priority:*** 1	Revised Safety Requirements and Guides covering nuclear installation safety according to the new structure.
3.2.2.2 Providing support to the CNS, INSAG, and coordinating with other international organizations ***Duration:*** Recurrent ***Priority:*** 1	CNS website; report of the review meeting of the CNS; INSAG reports; joint activities with NEA.
3.2.2.3 Enhancing Member States capabilities in nuclear safety by promoting an integrated approach to safety as well as standards and services in the area of management systems ***Duration:*** Recurrent ***Priority:*** 1	Safety standards in the area of management systems; reports from integrated nuclear safety services and assessments; guidance documents and mission reports in the area of management systems.
3.2.2.4 Supporting Member States in developing and maintaining nuclear safety infrastructure ***Duration:*** Recurrent ***Priority:*** 2	Trained Member State staff in developing and maintaining safety infrastructure; network for the exchange of information on nuclear safety infrastructure established.

Subprogramme 3.2.3 Development and Use of Advanced Safety Assessment: Methods and Applications

Rationale: Safety assessment is the systematic process that is carried out throughout the design and operation of nuclear installations to ensure that all relevant safety requirements are met. In recent years a number of developments have taken place which require a close examination of its impact on the safety of nuclear power plants. Examples of such developments are: the use of advanced computer codes and analysis methodologies (i.e. best estimate methods, advanced computational tools); increasing need for safety analysis for the long term operation of existing nuclear power plants and innovative designs; greater interest in utilizing existing safety margins and higher operational flexibility (advanced fuel design and operation with high burnup fuel); probabilistic safety assessment (PSA) applications (i.e. risk informed decision making); integration of deterministic and probabilistic safety approach; development and implementation of severe accident management programmes; and regulatory trends on advanced safety assessments. Advanced tools for safety assessment are needed to enhance nuclear safety, and also to reduce operating costs by making better use of existing safety margins. The experience in using advanced methodologies needs to be exchanged and shared at the international level.

Objectives:

— To achieve harmonized, effective and transparent safety assessment capabilities among Member States.
— To use integrated deterministic and probabilistic safety assessment methods in Member States for risk informed and performance based assessment of safety.

Outcome	Performance Indicator
— Enhanced capability in Member States for nuclear safety design and operation using advanced methodologies allowing reduction of safety assessment uncertainties and better use of existing safety margins.	— Number of Member States using the guidance developed by the Agency and number of Member States exchanging and sharing related experience.

Programmatic changes and trends: Safety assessment methods need to be capable of addressing innovative design as Member States explore the deployment of new reactors with higher efficiency, different coolants and fuels. Along with safety issues, security assessment capabilities must be addressed, particularly since some security objectives may contradict safety objectives. Also, many of the analytical techniques developed for the safety evaluations of nuclear power plants are, in principle, applicable for security assessments. These techniques need to be explored, modified accordingly for security, and a comprehensive integrated approach to safety/security evaluation needs to be developed. In response to these challenges, Subprogramme 3.2.3 has been readjusted for this biennium, with improved focus on critical issues and enhanced service capability to Member States.

Resource changes and trends: The proposed resources reflect an increase of 27.2% (€315 236) in 2008 as compared with 2007, and a slight decrease in 2009 as compared with 2008, due to the fact that activities and the corresponding resources were shifted from Subprogramme 3.2.2 National and Global Nuclear Safety Programme Enhancements in order to properly reflect increased emphasis on safety assessment, including specialized training and the preparation of additional safety standards.

3.2.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 513 521	1 496 869
Extrabudgetary	738 396	467 852
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.3.1 Assist in harmonizing the use of advanced safety analysis methods for existing nuclear installations and for future designs ***Duration:*** Recurrent ***Priority:*** 1	Safety standards; advanced safety assessment tools (CASAT); deterministic assessment; training; information exchange.
3.2.3.2 Probabilistic safety analysis and risk informed applications for existing nuclear installations and for new build facilities ***Duration:*** Recurrent ***Priority:*** 1	Safety standards; advanced safety assessment tools; probabilistic assessment; information exchange.
3.2.3.3 Fostering technical developments and trends in safety analyses ***Duration:*** Recurrent ***Priority:*** 1	Technical working papers on high temperature gas cooled reactors, accident analysis; safety goals, risk estimates and Level 3 PSA; high burnup fuel safety issues; methods for assessing the performance of passive safety systems.

Subprogramme 3.2.4 Engineering Safety for Site Evaluation, Design and Long Term Operation

Rationale: Since the entire process of site safety evaluation covers the site selection, assessment, pre-operational and operational stages, Member States need to either evaluate in detail a new nuclear facility site as part of the siting process, or re-evaluate an existing operational site as one of the components of the periodic safety reviews, as well as conducting a full environmental impact assessment. The continuing evolution of codes and standards that apply new requirements, evidence of external hazards due to new or additional available data that are greater than the design basis, the identification of new technical findings in response to recent experiences with natural phenomena and the increasing trend to apply probabilistic methodologies, all contribute to the need to conduct such re-evaluations.

There is considerable activity around the world in the area of evolutionary and innovative reactors. Moreover, there is an increasing trend for plants to be built in countries different from that of the original design. Consequently, there is a need to define a strategy to achieve an internationally agreed, safety driven design process and procedure to deal with these situations. The Agency has been the focal point for achieving consensus on the safety approach to evolutionary reactors, preparing safety standards and providing safety review services to check compliance with those standards. In particular, the results of safety review missions will continue to provide input for the revision of design safety standards. The Agency's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) has developed a methodology for the assessment of innovative nuclear reactors to be built in the coming decades, and the Generation IV project is carrying out extensive research programmes for the development of several promising innovative concepts. In this regard, the Agency has already prepared a proposal for a suitable safety approach and anticipates continuing to provide a forum to achieve international consensus in this regard.

Objectives:

— Member States adequately monitor their nuclear facilities with respect to site safety related aspects and external/internal hazards, including seismic assessment utilizing PSA and the design aspects related to protection against sabotage.

— Member States strengthen their capabilities in the achievement of a high level of safety in existing nuclear power plants and in the design of evolutionary and innovative power reactors covering all related engineering aspects.

Outcome	Performance Indicators
— Compliance of Member States with the requirements and recommendations of the Agency's safety standards in the area of engineering safety for site evaluation, design and long term operation	— Number of Member States that, integrally or partially, apply or use the Agency's safety standards in the area of engineering safety for site evaluation, design and long term operation — Number of engineering safety review services requested by Member States — Progress in the resolution of identified safety issues during engineering safety review services due to the implementation measures taken by Member States

Programmatic changes and trends: The emphasis in the subprogramme will shift towards safety services to Member States starting a nuclear power programme. The long term operation of nuclear facilities will also receive emphasis as a result of emerging Member State demand in this area. Design re-evaluation and safety upgrades to operating nuclear power plants will decrease in the regular budget activities. These will be funded by extra budgetary programmes.

Resource changes and trends: The 2008–2009 proposed regular budget resources, in real terms, are consistent with 2007.

3.2.4	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	1 160 008	1 186 027
Extrabudgetary	1 081 225	525 315
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.4.1 Providing for the site safety and the evaluation of external and internal hazards for nuclear facilities ***Duration:*** Recurrent ***Priority:*** 1	New and updated safety standards and related technical supporting documents corresponding to site selection and evaluation and external and internal hazards; mission reports which identify issues to Member States related to the conducted site evaluation reviews, assess their current resolution status, and provide recommendations for resolving the remaining issues; reports to Member States which identify lessons learnt or good practices; publications on the results from completed CRPs.
3.2.4.2 Providing for safe design of evolutionary and innovative nuclear power plants ***Duration:*** Recurrent ***Priority:*** 1	New and updated safety standards; related technical supporting documents corresponding to the set of standards for design aspects, and updated tools for preparation and review of safety analysis reports; mission reports to identify issues to Member States related to the conducted design reviews; assessment of their current resolution status, and provision of recommendations for resolving the remaining issues; reports to Member States providing lessons learnt or good practices; publications on the results from completed CRPs.

Subprogramme 3.2.5 Operational Safety and Effective International Operating Experience Feedback

Rationale: The background and basis for this subprogramme takes into consideration Member State recommendations made during the 2004 Agency conference on topical issues in nuclear safety, the 2005 conference on operational safety performance in nuclear installations, and the 2006 OECD/NEA — IAEA international conference on improving nuclear safety through operating experience feedback.

The 3rd review meeting of the CNS emphasizes the need to improve the sharing and use of international operating experience and the international assessment of operational performance by Operational Safety Review Team (OSART) missions. In addition, General Conference resolution GC(50)/RES/10 encourages Member States to continue requesting Agency safety review services and encourages the Secretariat to continue assisting Member States to apply the safety standards. Operational safety services are fully based on the safety standards, and they represent a unique set of tools that are used for the harmonization and integrated assessment of operational safety in nuclear power plants around the world. In addition, the results are being used to provide issues and trends for dissemination to Member States and for strengthening operational safety services within the global nuclear safety regime.

The Agency will continue to support Member States in enhancing their capabilities to manage and improve a high level of safety in the operation of nuclear power plants. This subprogramme will also manage the Incident Report System (IRS) and will also be responsive to special event assessment service requests by Member States.

Objectives:

— Enhanced Member State capabilities to manage and improve a high level of safety in the operation and maintenance of nuclear power plants through the application of Agency safety standards and operational safety review services.

— Enhanced Member States capabilities to perform self-assessment of operational safety in nuclear power plants and effective use of international operating experience.

Outcomes	Performance Indicators
— Operational safety improvements in Member States based on the implementation of recommendations and suggestions of operational safety review services.	— Number of OSART/Peer Review of Operational Safety Performance Experience (PROSPER) missions requested by Member States, and the percentage of Agency recommendations and suggestions on operational safety improvements adequately addressed in nuclear power plants in Member States.
— Improved capability by Member States to manage and improve a high level of safety in the operation and maintenance of nuclear power plants through high quality self-assessment and through the application of Agency safety standards.	— Number of nuclear power plant documented self-assessments of the improvements made to operational safety prior to the mission and as a result of the actions taken to address Agency recommendations and suggestions.

Programmatic changes and trends: The strategic direction will be focused on keeping the high quality of operational safety services, improving knowledge and expertise of experts from the Agency and Member States. The feedback from services will be used for their further improvement, and for review and revision of Agency safety standards for operation and the transition period from operation to decommissioning. New development will include the analysis and evaluation of operating experience feedback, promotion of proactive management of operational safety, support of operational aspects of extended operation and assessment of readiness of operating organizations to operate new nuclear power plants. The subprogramme will broaden the capability to collect, evaluate and analyse operational safety events, by providing a quality database (IRS), development issues and trends for dissemination to Member States, and for strengthening operational safety services within the global nuclear safety regime.

Resource changes and trends: The proposed resources, in real terms, reflect a decrease of 2.7% (€43 879) in 2008 as compared with 2007 and a 1.8% increase (€28 980) in 2009 as compared with 2008. The overall decrease compared with 2007 is due to the net result of an increase in data processing and general operating costs for event reporting and analysis (IRS), which was transferred here from Subprogramme 3.2.1, National Regulatory Framework and Approaches to Enhance Regulatory Effectiveness, and more than an offsetting decrease due to staff cost savings from efficiency gains, mostly in the general services area, and a reduction in travel costs due to a higher rate of TC and extrabudgetary programme support.

3.2.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 641 674	1 671 424
Extrabudgetary	262 401	262 401
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.5.1 Enhancing the operational safety performance of nuclear power plants ***Duration:*** Recurrent ***Priority:*** 1	Mission reports on safety review (OSART) services to strengthen operational safety in specific areas in the management of safety in nuclear installations; revision of safety standards on the safety of nuclear power plant operation; publications on OSART recommendations and highlights; CD-ROM containing the OSART Mission Results Database; mission results providing input on issues and trends for Member State use in preparing country specific reports for the CNS; report on the evaluation of the effectiveness of Agency operational safety services; new Agency concepts for cross-cutting activities such as training, operating experience, management systems, long term operation, commissioning PSA applications, accident management; preparations for integration of decommissioning activities into safety reviews; results of safety review services for safe extended operations; and preparation of commissioning, operation and transition to decommissioning.

Title, duration and priority	Main outputs
3.2.5.2 Strengthening the exchange and utilization of international operating experience feedback ***Duration:*** Recurrent ***Priority:*** 1	Mission reports on safety review (PROSPER) services provided to strengthen operational experience feedback programmes; publications covering all aspects of the management and conduct of an effective operational experience feedback programme; database of results from PROSPER missions and the OSART Operational Experience Module; development of a harmonized, web based system covering all types of nuclear installations and containing lessons learned; report containing events information (IRS); training materials and information for Member State personnel on the latest techniques in operating experience feedback.

Subprogramme 3.2.6 Safety of Research Reactors and Fuel Cycle Facilities

Rationale: General Conference Resolution GC(45)/RES/10 endorsed a Board of Governors decision to request the Secretariat to develop and implement, in conjunction with Member States, an international research reactor safety enhancement plan. The main elements of this plan were the preparation and promulgation of a Code of Conduct on the Safety of Research Reactors, and the surveying and subsequent strengthening of the monitoring of research reactor safety in Member States. The implementation of this plan continues with the promulgation of the Code of Conduct, the coordination of assistance and safety review services to Member States, and the completion of new, and a revision of existing, standards. The effective implementation of this plan makes use of synergies with other Agency activities such as security and utilization of research reactors and utilizes web based communication facilities.

A coordinated approach to the development of safety performance indicators for fuel cycle facilities (FCFs) is being adopted. In parallel, the Agency will continue to improve the safety services offered in the area of Safety Evaluation During Operation (SEDO) missions that commenced in 2006 looking at uranium fuel fabrication facilities. During the period 2008–2009, the scope of SEDO missions will widen to cover other types of fuel facilities. The development and updating of the set of safety standards specific to the FCFs will be continued, together with the promotion of their use by Member States. The Agency will assist Member States in reviewing and improving the safety related documentation of their FCFs in accordance with the requirements of the standards, as well as in the area of regulatory supervision. The Fuel Incident Notification and Analysis System will continue to be developed to make it available through the IRS internet platform, facilitating the analysis and exchange of lessons learned from operating experience.

Objective: To achieve enhanced safety of research reactors and fuel cycle installations in Member States through: dissemination and application of the Code of Conduct on the Safety of Research Reactors; developing and applying safety standards and conducting integrated safety assessment missions and other safety review services for research reactors and fuel cycle facilities according to the needs, expectations and priorities of Member States; sharing information, lessons learned and feedback on the safety of research reactors and fuel cycle facilities; monitoring the safety of research reactor under Project and Supply Agreements.

Outcomes	Performance Indicators
— Improvements of the safety of research reactors in Member States due to the effective application of the Code of Conduct on the Safety of Research Reactors.	— Number of Member States applying the Code of Conduct.
— Enhanced operational safety of research reactors and fuel cycle facilities in Member States based upon the Agency safety standards and implementation of recommendations and suggestions from Agency safety review services.	— Number of Integrated Safety Assessment of Research Reactors (INSARR) and SEDO mission requests from Member States and percentage of Agency recommendations and/or suggestions implemented by Member States.
— Enhanced safety status of research reactors subject to Project and Supply agreements.	— Percentage of reactors subject to Project and Supply Agreements meeting their obligations.

Outcomes	Performance Indicators
— International consensus achieved on the development of safety standards for research reactors and fuel cycle facilities.	— Safety standards for research reactors and fuel cycle facilities approved in accordance with the action/work plan established by the safety standards committees.
— Enhanced information system related to safety of research reactors and fuel cycle facilities.	— Number of Member States contributing timely information to the upgraded databases for research reactors and fuel cycle facilities

Programmatic changes and trends: The Code of Conduct on the Safety of Research Reactors will provide an important tool to secure political commitment to improve the overall safety of research reactors. It will also promote the use of the Agency's safety standards. The web based Incident Reporting System for Research Reactors (IRSRR) will continue receiving more attention from Member States and better cooperation among participating members will be established. The focus will be the application of the Code of Conduct and the Agency's safety standards and the use of a follow-up system for research reactors under Project and Supply Agreement.

As for fuel cycle facilities, the primary objective of this programme is the completion of the set of facility specific safety standards to address all types of fuel cycle facilities. During 2008–2009, the Agency's involvement will be increased to support Member States in the application of these standards and related documents through various services to Member States. The web based Fuel Incident Notification and Analysis System will continue receiving more attention from Member States and better cooperation among the participating members will be established. The global safety of fuel cycle facilities will be improved through the application of safety standards and the exchange of information on operational experience.

Resource changes and trends: The proposed resources, in real terms, reflect a decrease of 12.6% (€153 144) in 2008 as compared with 2007 and an increase of 2.8% (€29 600) in 2009 as compared with 2008, due to the transfer of one post into the safety assessment area and efficiency gains achieved with respect to CRPs by reducing travel and research contract expenditure and increasing the use of video conferencing. Some short term professional support will be funded from extrabudgetary resources.

3.2.6	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 095 232	1 125 559
Extrabudgetary	378 876	378 876
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.2.6.1 Enhancing the safety of research reactors ***Duration:*** Recurrent ***Priority:*** 1	Training material and mission reports on the application of the Code of Conduct on the Safety of Research Reactors; self-assessment on safety aspects of research reactors and technical advice from safety review missions and expert missions; mission reports with recommendations and suggestions on core management, including core conversion; safety of experiments; ageing management; safety analysis reports; safety management; decommissioning plan; publication on progress reports and recommendations from CRPs and the data accumulated.
3.2.6.2 Monitoring and safety enhancement of research reactors under agreement ***Duration:*** Recurrent ***Priority:*** 2	Mission reports with suggestions and recommendations for safety improvements; reports on safety review of the facilities to verify actions to comply with the requirements of the Agency safety standards; summary reports on safety performance indicators, generic problems and trends.

Title, duration and priority	Main outputs
3.2.6.3 Fostering international exchange of information on research reactor safety aspects ***Duration:*** Recurrent ***Priority:*** 3	Research Reactor Information Networks (RRIN) to allow experts from the research reactor community to communicate and exchange information on safety issues and operational experience feedback.
3.2.6.4 Enhancing the safety of Fuel Cycle Facilities (FCF) ***Duration:*** 2008–2009 ***Priority:*** 1	Complete set of safety guides for FCFs; on request of Member States, implementation of operational safety review missions with production of mission reports, containing recommendations and suggestions; collection and dissemination of FCF operating experience feedback; development of training material and delivery of training courses/workshops.

Programme 3.3 Radiation and Transport Safety

Rationale: This programme is concerned with the protection of people — workers, patients and members of the public — and the environment from the detrimental effects of radiation exposure. It covers the Agency's statutory functions of establishment of safety standards relating to radiation sources, including radioactive materials, and providing for the application of those standards. All security activities related to safety are included in this programme; the prevention and detection of, and response to malicious acts involving radioactive materials, however, are covered by the programme on nuclear security.

There is considerable benefit associated with reaching international consensus on the content of radiation and transport safety standards and the Agency is in a unique position to do this through the creation and maintenance of a set of harmonized safety standards that takes account of recent trends and developments. Strengthening the application of the Agency's safety standards also contributes to a harmonized safety regime in the radiation and transport areas.

During the period covered, emphasis will be given to the thorough review and revision of the International Basic Safety Standards for the Protection Against Ionizing Radiation and for the Safety of Radiation Sources (BSS) and associated safety standards, as well as the ongoing review and revision of the Regulations for the Safe Transport of Radioactive Material. Support to Member States in their development of appropriate infrastructures to implement those standards will also continue, covering integrated safety evaluations, sustainable education and training, a harmonized approach to technical cooperation and assistance, and strengthened information and communication networks.

Objective: To establish global radiation and transport safety policies, criteria and standards, and to achieve a global harmonization of their application for the safety and security of radiation sources and thereby to raise the levels of protection of people, including Agency staff, against radiation exposure.

Outcome	Performance Indicators
— Increased use by Member States of Agency radiation and transport safety standards for improved protection against ionizing radiation and improved safety of radiation sources.	— Number of countries applying the Agency radiation safety standards in all thematic safety areas.
— Radiation and transport safety standards approved in accordance with the timelines set out in the Document Preparation Profile	— Number and nature of radiation and transport safety standards approved.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: Feedback from the Agency's Safety Standards Committees indicates that publications in the Safety Standards Series are of great benefit to Member States. Further, Member States have expressed a strong desire for stability in international standards. These recommendations have been taken into account in planning the preparation of safety standards. Programme evaluations and feedback received from Member States indicate that the programme needs to continue the efforts to strengthen national regulatory infrastructures so that there is full and continuous implementation of the radiation safety standards and international undertakings. Further, harmonized application of the radiation safety standards is required to ensure an effective and efficient use in all forms of exposure

(occupational, public and medical) and all types of facilities, practices and activities. These aspects have been included in the programmatic activities outlined below.

In addition, as recommended at recent conferences and conventions, a consolidated methodology has been developed to collect and analyse, in a systematic way, feedback from the experience of all Member States in the application of Agency radiation safety standards and to then utilize this information to improve the development of future, and revision of existing, radiation safety standards.

3.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	5 359 314	5 359 052
Extrabudgetary	2 240 114	2 214 114
Unfunded	—	—

Specific criteria for prioritization:

1. First priority is given to projects establishing standards and servicing conventions.
2. Second priority is given to the projects related to the application of standards.
3. Third priority is given to projects dealing with the strengthening of information exchange.

Subprogramme 3.3.1 Developing Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources

Rationale: Safety standards should be reviewed every five to six years to determine whether they need to be revised. On this basis there are a number of radiation safety related standards and associated documents which will require review in 2008–2009. Several factors influence the decision for a revision, such as new recommendations by the ICRP.

The Agency's Statute requires the Agency to consult with and, where appropriate, collaborate with the competent organs of the UN and other concerned specialized agencies in the establishment or adoption of safety standards. Such consultation or collaboration is very important to avoid duplication of requirements or a situation where there is a lack of harmonization among different regulatory authorities in Member States. This cooperation is maintained through the Inter-Agency Committee on Radiation Safety, in which the Secretariat plays a leading role.

Objective: To achieve global acceptance of international safety standards that protect people against ionizing radiation and foster a sustainable global system of control of radiation sources.

Outcome	Performance Indicator
— International consensus achieved on Agency radiation safety standards.	— Published international safety requirements, safety guides and other guidance documents, and progress towards reviewing, revising and developing international safety requirements, safety guides and other guidance documents. — Increase in number of Member States adopting the Agency's radiation safety standards.

Programmatic changes and trends: While this is an ongoing programme for continual improvement in radiation safety standards, the need to complete the revision of the BSS will redirect the emphasis from development of additional guidance to achieving international consensus on the new BSS. Further, during this cycle the focus will be on revision of existing publications rather than generation of new ones.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect a decrease of 6.0% (€113 992) in 2008 as compared with 2007 and no change in 2009 as compared with 2008, as stronger emphasis will be placed on the application of standards and on promoting their effective implementation in Member States.

3.3.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	1 835 315	1 835 271
Extrabudgetary	45 261	45 261
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.3.1.1 Developing and maintaining radiation safety standards in general radiation protection, including a revision of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) ***Duration:*** 2006–2011 ***Priority:*** 1	Revised Safety Requirements on: the BSS; Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety; Safety Guides on justification of practices involving the use of ionizing radiation; Safety Guide on management systems for regulatory bodies.
3.3.1.2 Developing and maintaining safety standards and guidance for public exposure and emergency exposure situations ***Duration:*** 2006–2011 ***Priority:*** 1	Safety Guide on public exposure to natural sources of radiation; technical basis for safety standards and guidance, including emergency preparedness; input to the revised BSS; publications to support the implementation of the safety standards.
3.3.1.3 Developing and maintaining standards, guidance and international undertakings related to the control of radiation sources ***Duration:*** Recurrent ***Priority:*** 1	Safety guides on radiation safety in practices in industry, medicine, research and education; maintained and updated web site for the Code of Conduct; meeting reports.
3.3.1.4 Developing and maintaining safety standards and guidance for occupational exposures ***Duration:*** 2006–2011 ***Priority:*** 1	Safety guide and guidance documents on occupational exposures.

Subprogramme 3.3.2 Strengthening Regulatory Infrastructure and Harmonizing the Application of the Radiation Safety Standards

Rationale: Member States need to have an adequate and sustainable national radiation safety infrastructure to adequately use and control radiation sources. In order to achieve this, it is fundamental to strengthen their regulatory infrastructure and ensure its maintenance. However, many countries still lack the expertise and resources to establish and operate effective and sustainable regulatory programmes. The IRRS and the related self-assessment tool will be used as an effective means to assist Member States, both developing and developed, to assess and then strengthen their regulatory infrastructures.

Harmonization of the application of the radiation safety standards and the Code of Conduct for the Safety and Security of Radioactive Sources is needed to ensure an effective and efficient application across all forms of exposure (occupational, public and medical) and all types of facilities, practices and activities. The harmonized application is based on identifying Member State needs, through a robust quantitative assessment scheme, and the ensuing action plans for the Member States to implement.

In order to better decide how much effort should be dedicated to the application of safety standards and the Code, there is a need to develop and consolidate a methodology to collect and analyse, in a systematic way, feedback from the experience of all Member States in the application of Agency radiation safety standards and

the Code and to then utilize this information to improve the development of future, and revision of existing, radiation safety standards and related documents.

Objective: To achieve effective and sustainable national regulatory infrastructures in Member States for the control of radiation sources by means of a harmonized application of the Agency's radiation safety standards and international undertakings through integrated review and appraisal services, the provision of technical assistance, education and training, and networking.	
Outcome	**Performance Indicators**
— Increased compliance with the international standards for radiation safety.	— Number of countries having an effective and sustainable regulatory infrastructure for the control of radiation sources in accordance with international standards and the Code of Conduct on the Safety and Security of Radioactive Sources. — Number of IRRS missions requested by Member States and percentage of recommendations and suggestions on regulatory improvements adequately addressed. — Number of self-assessments provided to the Agency.

Programmatic changes and trends: This new subprogramme is the result of more emphasis being placed on national regulatory infrastructures and the harmonized application of the radiation safety standards across all radiation exposures (occupational, public and medical) and all facilities, practices and activities (medical, industry, research, waste facilities, decommissioning and remediation).

The IRRS, a new regulatory service of the Agency, was set up to utilize the knowledge and experience gained, over many years, in the performance of several specialized peer reviews and appraisals of specific aspects of national radiation safety infrastructures. These previous services included: the International Regulatory Review Team programme; the Radiation Safety and Security Infrastructure Appraisal; the Transport Safety Appraisal Service; and the Emergency Preparedness Review that is conducted to review both the preparedness in the case of nuclear accidents and radiological emergencies and the appropriate legislation. The IRRS is more than just the simple integration of these previous services — there have been gains in effectiveness and consistency, there is flexibility in defining the scope of the review, and both the technical and policy aspects of regulating are considered.

In parallel with IRRS, the use of a self-assessment tool by Member States is being introduced and promoted. Based on the same approach as the IRRS, self-assessment allows a Member State to continually assess its own progress towards compliance with the radiation safety standards.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 2.2% (€43 500) in 2008 as compared with 2007 and no change in 2009 compared with 2008, due to more emphasis being placed on the work of this subprogramme.

3.3.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 064 527	2 064 458
Extrabudgetary	1 447 853	1 462 853
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.3.2.1 Strengthening national regulatory infrastructure ***Duration:*** 2008–2009 ***Priority:*** 1	IRRS reports, with their recommendations, suggestions and identified good practices, for Member States requesting these services; self-assessment tool; RaSaReN newsletter; standardized training packages.

Title, duration and priority	Main outputs
3.3.2.2 Implementing a strategy for sustainable education and training ***Duration:*** 2008–2009 ***Priority:*** 1	EduTA reports and the ensuing action plans; specialized training packages from all Agency sources, translated into all official Agency languages; e-learning systems; guidance document for self-assessment on the effectiveness of a training programme.
3.3.2.3 Promoting and implementing a harmonized application of the radiation safety standards ***Duration:*** 2008–2009 ***Priority:*** 1	Internal strategy for the integrated and harmonized application of the radiation safety standards, including policy documents; integrated methodology for collecting, analysing and utilizing feedback from Member States on the application of the radiation safety standards; Radiation and Waste Safety Infrastructure Profiles (RaWaSIP) and action plans based on the Quantitative Assessment Scheme (QAS); Integrated Information Management System to manage the harmonizing methodology and the feedback methodology.
3.3.2.4 Promoting and facilitating the implementation of international undertakings for the control of radiation sources ***Duration:*** 2008–2009 ***Priority:*** 1	National registers of radiation sources in most Member and non-Member States.
3.3.2.5 Rendering radiation protection and monitoring services to the Agency's own operations ***Duration:*** Recurrent ***Priority:*** 1	Reports of regulatory monitoring services; individual dose assessment reports; QMS procedures for technical services; reports on operational radiation protection programmes; advice on radiation protection issues for the Agency's Laboratories; results of the review of safety reports and training for Agency staff members.

Subprogramme 3.3.3 Radiological Protection of Patients

Rationale: The exposure of patients is by far the largest type of exposure to the world's population from human made radiation sources. For example, the exposure of the world's population from diagnostic examinations is about 150 times higher than all occupational exposure from all radiation sources. In addition, some types of exposure are so high that radiation injuries occur and accidental exposure from therapeutic applications can be very severe, as shown by the information collected by the Agency.

Consistent with its statutory functions for the establishment of safety standards and provision for their application, the Agency developed the International Action Plan for the Radiological Protection of Patients, which was approved by the Board of Governors in 2002 (GOV/2002/36-GC(46)/12) and endorsed by the General Conference in resolution GC(46)/RES/9.

A steering committee involving other UN bodies and international organizations and professional societies concerned with patient protection was established for the follow-up of the subprogramme. One of the important recommendations was that absolute priority should be given to make accessible practical, concise and useful information on patient protection to health professionals and of the general public through a dedicated web site.

Objective: To achieve global acceptance of radiological protection of patients in medical practices at the level of end users (hospitals).

Outcome	Performance Indicators
— Improved radiological protection of patients in diagnostic, interventional and radiotherapy procedures.	— Reduction of unnecessary exposure in diagnostic examinations. — Reduction of radiation injuries in interventional procedures. — Reduction of accidental exposure in radiotherapy.

Programmatic changes and trends: Based on data from the global medical community, the number of diagnostic, interventional and therapeutic procedures continues to increase. There is a need for more assistance in the area of patient protection. As a result the steering committee has assigned the greatest priority to the dedicated information web site.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 15.0% (€85 330) in 2008 as compared with 2007 and no change in 2009 as compared with 2008. As a result of the increasing demand for assistance by Member States, and the challenges posed by new technologies, it is necessary to increase staffing levels. Savings from other areas of the programme have been redeployed to strengthen the activities in this subprogramme.

3.3.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	673 712	673 654
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.3.3.1 Optimizing radiological protection of patients in diagnostic and interventional procedures using X rays ***Duration:*** 2006–2011 ***Priority:*** 1	Guidance documents on requirements for experts in radiation protection in medical practices; web site containing patient and medical information on dose reduction in diagnostic, interventional and therapeutic procedures; reports and publications on assistance to Member States in the application of the safety standards.
3.3.3.2 Optimizing radiological protection of patients in nuclear medicine and avoiding accidental exposure in radiotherapy ***Duration:*** 2006–2011 ***Priority:*** 1	Guidance on reduction of dose to public and caregivers from medical procedures; new material for web site on radiological protection of patients; revised training publication on radiological protection of patients.

Subprogramme 3.3.4 Safety of the Transport of Radioactive Material

Rationale: The Regulations for the Safe Transport of Radioactive Material (the Transport Regulations) have been developed in consultation and collaboration with the UN modal transport organizations and are recognized as the international authoritative standards for national, international and regional agreements on the safe transport of radioactive material. The Secretariat has a statutory responsibility to provide for the application of Agency safety standards, specifically in the context of the transport of radioactive material, and has been encouraged by the General Conference to provide appropriate appraisal services. Later resolutions including, inter alia, GC(48)/RES/10C, encourage Member States to avail themselves of the Transport Safety Appraisal Service (TranSAS). Such services are aimed at enhancing Member State capabilities and infrastructure in both safety and security. This has the additional advantage of facilitating the harmonized implementation of the Transport Regulations throughout the world. The General Conference has also requested that the Agency implement a Board approved Action Plan that, inter alia, addresses application issues related to training, denial of shipments, transport emergency response, quality and compliance assurance and the safe transport of naturally occurring radioactive material (NORM).

Objective: To ensure the safe, secure and expeditious transport of radioactive material world wide and achieve global harmonisation and optimisation of radiation protection during transport.

Outcome	Performance Indicator
— International consensus achieved in Agency transport safety standards and consensus on standards for the safe transport of radioactive material by all modes of transport.	— Transport safety standards approved according to the General Conference resolutions.

Programmatic changes and trends: The technical scope of this subprogramme remains largely unchanged from the 2006–2007 programme. One project has been divided into two and account has been taken of the findings of the 2003 conference on the Safety of Transport of Radioactive Material and the Action Plan that was approved by the Board of Governors in March 2004. The maintenance of the Agency's Transport Regulations and provision for their application through appraisal services will remain central to this subprogramme. The Agency attaches considerable importance to the harmonization of all the international regulations for the safe transport of radioactive material. Consideration will continue to be given to the security of materials in transport and the problems posed by the denial of shipments and transport of NORM.

Resource changes and trends: The proposed resources reflect a decrease of 7.5% (€62 260) in 2008 as compared with 2007, and no change in 2009 as compared with 2008, as savings in this subprogramme have been redeployed to strengthen activities and fund the additional costs required under Subprogrammes 3.3.2, Strengthening Regulatory Infrastructure and Harmonizing the Application of the Radiation Safety Standards, and 3.3.3, Radiation Protection of Patients.

3.3.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	785 760	785 669
Extrabudgetary	747 000	706 000
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.3.4.1 Reviewing and revising the international regulations for the safe transport of radioactive materials and associated guidance ***Duration:*** 2006–2011 ***Priority:*** 1	Revised regulations (TS-R-1) consistent with the Basic Safety Standards; guides on the application of radiological protection programmes in transport activities consistent with the Basic Safety Standards.
3.3.4.2 Incorporating regulations for the safe transport of radioactive material into the UN Recommendations for Safe Transport of Dangerous Goods and the Modal Regulatory Requirements of ICAO and IMO ***Duration:*** 2006–2011 ***Priority:*** 1	Updated cross-mapping of the different international instruments governing the safe transport of radioactive material; deviations in the different international instruments identified and addressed.
3.3.4.3 Appraising compliance with the safety standards for the transport of radioactive materials ***Duration:*** 2006–2011 ***Priority:*** 1	Reports of transport safety appraisals (TranSAS) providing documented independent expert appraisal of Member States' implementation of the Transport Regulations; appraisals of Member State application of requirements for security in transport of radioactive material – assisting Member States in understanding areas for improvement in security in the transport of radioactive material; Member State experts trained in transport safety and security (providing a cadre of experts for support of regional training courses).

Programme 3.4 Management of Radioactive Waste

Rationale: Nuclear fuel cycle facilities and other activities and facilities handling, using and processing radioactive material inevitably generate radioactive waste whose management also often gives rise to effluent discharge to the environment. As with all radiation material, such waste is potentially hazardous to health and the environment and must be carefully managed, discharges controlled and facilities carefully decommissioned, which may also require restoration of affected environments. Radioactive waste must be immobilized and safely stored or placed in disposal facilities isolated from the human habitat. These facilities and activities require safety standards and appropriate technologies. In addition, several international agreements place obligations on the Agency, namely the Joint Convention on the Safety of Spent Fuel Management and on the Safety of

Radioactive Waste Management (the Joint Convention), the Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Materials (the London Convention), the UN Conference on Environment and Development (UNCED or Rio Declaration), and the UN Global Plan of Action for Protection of the Marine Environment from Land-based Activities. Other regional undertakings also apply to radioactive wastes and the environment and also involve the Agency, e.g. the Oslo and Paris Convention for the Protection of the Marine Environment of the North–East Atlantic (the OSPAR Convention).

The amount and types of waste generated by different countries varies considerably. Nevertheless it is of primary importance that the Agency's programme on radioactive waste management sets up and promotes a universally applicable global waste safety regime for use by the Member States in their own programmes and to resolve issues with their neighbours. The establishment and maintenance of such a regime is the ultimate objective of the programme. Since the duration of waste management projects in Member States can last for tens to hundreds of years, continuity and sustainability in programme activities is of considerable importance. As a consequence, most of the projects proposed for 2008–2009 continue existing ones and are expected to continue in some form beyond.

Objective: To achieve global harmonization in policies, criteria and standards governing waste safety and public and environmental protection, together with provisions for their application including state of the art technologies and methods for demonstrating their adequacy.

Outcomes	Performance Indicators
— International consensus achieved on Agency radioactive waste safety standards.	— New or revised radioactive waste safety standards approved.
— Use by Member States of state of the art technologies in radioactive waste management and best practices as documented in Agency publications.	— Number of Member States having developed a national strategy for radioactive waste as reported in international forums and other publications.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: An important lesson learned is that, while the number of Contracting Parties to the Joint Convention is increasing and most countries with nuclear power stations are now members, many others for whom the Joint Convention is equally applicable are not. This appears to arise from concern over the necessary commitments and a lack of appreciation of the benefits from involvement. Efforts will therefore be intensified to promote an awareness of the benefits and assist countries to participate in the Joint Convention, and to generally promote and strengthen a global waste safety regime.

While good progress has been made in the past on the development of safety standards, some areas have been identified where additional work is necessary. Particular areas are spent fuel management, long term storage of waste, safety assessment for both predisposal and disposal. Of more concern, however, is the use and application of the safety standards. As such, increasing effort will be placed on evaluating Member State needs in terms of using the standards and providing assistance to enable them to effectively use and comply with standards.

Although significant progress has been made in Member States in managing their radioactive waste safely, efforts are still needed in a number of countries to develop their strategy and strengthen their national infrastructure. One of the main objectives of this programme in 2008 and beyond is to continue to provide guidance and assistance to Member States for the establishment or enhancement of a radioactive waste management system. Emphasis will also be placed on innovative approaches to facilitate the transfer of information and know-how among Member States.

3.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	6 327 422	6 327 751
Extrabudgetary	1 313 869	1 328 869
Unfunded	51 500	101 500

Specific criteria for prioritization:

1. First priority is given to establishing standards and to safety projects also supporting security.
2. Second priority is given to actions for the application of standards and the service of the Joint Convention, and transfer of technology for radioactive waste management.
3. Third priority is given to strengthening information exchange.

Subprogramme 3.4.1 Development of an International Safety Regime for the Management of Radioactive Waste

Rationale: Together, the Joint Convention and the safety standards and the associated peer review processes form an international regime through which the safety of radioactive waste management is being continuously reviewed, assessed and upgraded. Establishing safety standards is a statutory function of the Agency; the waste safety standards are one set of these standards. To ensure that the set of waste safety standards are coherent with each other and with the Agency's other standards, they are reviewed by Member States and reviewed and approved by international committees of national regulators established for the purpose and by the Commission on Safety Standards.

In order to support this international safety regime, information related to the safety of radioactive waste management has to be collected, managed and disseminated in Member States and international organizations through an easily accessible mechanisms. The exchange of technical information and know-how needs to be promoted through the organization of international conferences and the coordination of international initiatives.

Objectives:

— To improve the safety of radioactive waste management in Member States.

— To improve awareness and understanding of radioactive waste management issues among the Agency's constituencies by effectively gathering, disseminating and communicating relevant information.

Outcomes	Performance Indicators
— Effective services provided to the Joint Convention.	— Number of countries ratifying the Joint Convention and participating in the review meetings.
— International consensus achieved on radioactive waste safety standards.	— Number of new or revised radioactive waste safety standards approved by the Waste Safety Standards Committee (WASSC).
— Enhanced established information systems on radioactive waste management.	— Extent to which Member States cooperate in providing data to the Net-Enabled Waste Management Data Base.

Programmatic changes and trends: The major effort will be to establish a global waste safety regime, in order to demonstrate to the general public the extent of adherence by Member States to the Joint Convention and to the Agency's waste safety standards when discussing practical options for radioactive waste storage and disposal.

The Secretariat has developed a promotional plan directed at Member States who are not yet contracting parties. This plan includes several new initiatives such as information meetings for specific audiences (decision-makers, head of regulatory authorities), and regional information symposia and workshops, expert visits to support Member States in their ratification process.

Finally, national inventories of radioactive waste published by international organizations (the Agency, OECD/NEA, EC, etc.) and the countries themselves, present discrepancies. There is a clear need for harmonization, which would contribute to clarity of the information published on radioactive waste.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect a decrease of 9.0% (€109 660) in 2008 as compared to 2007 and a minor decrease in 2009 as compared with 2008, as stronger emphasis will be placed on the application of standards and on promoting their effective implementation in the other three subprogrammes under this programme (following a recommendation of an evaluation in 2006).

3.4.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 136 322	1 127 813
Extrabudgetary	130 174	130 174
Unfunded	—	80 000

Projects

Title, duration and priority	Main outputs
3.4.1.1 Servicing the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and developing waste safety standards ***Duration:*** Recurrent ***Priority:*** 1	Biannual reports of WASSC; summary report for the third review meeting of the Joint Convention.
3.4.1.2 Facilitating exchange of information on radioactive waste management ***Duration:*** Recurrent ***Priority:*** 2	New edition of Radioactive Waste Management Profiles; results of lessons learned workshops posted on the Net Enabled Waste Management Database (NEWMDB) web site; workshop recommendations; NEWMDB Reading Room feature enhanced to a broader "radwaste management information portal" concept; statistics and user feedback posted in a publicly accessible NEWMDB 'consultation room'; annual report of the International Radioactive Waste Technical Committee (WATEC); WATRP international peer review mission reports; proceedings of international conferences and symposia; papers presented at international events and published.

Subprogramme 3.4.2 Management and Disposal of all Types of Radioactive Waste

Rationale: Radioactive waste from all types of nuclear activities or applications needs to be managed safely before disposal. However, there are a number of safety related issues that require attention, such as the safety implications of longer storage of radioactive waste when disposal facilities are not available or are built in a way that allows waste retrieval, as well as the adoption of holistic national strategies for waste management. The generally accepted method for disposal of waste is by emplacement in near surface or underground disposal facilities. There is international consensus that this cannot be reflected by long term surface storage. Nevertheless, challenges remain in providing convincing arguments and evidence that disposal facilities will provide safety in the long term. Most of the spent fuel is being stored above ground and the storage periods are increasing because decisions on the management of spent fuel are pending. Extending existing licences or issuing new licences for long term storage of spent fuel are issues because the behaviour of spent fuel, the container and the storage facility are to be known for the expected storage period. It also needs to be ensured that spent fuel can be retrieved and transported safely after the respective storage period.

Through this subprogramme the Agency successfully developed safety standards and organized two international conferences. The second review meeting of Contracting Parties to the Joint Convention also identified a number of issues that needed to be addressed for the safety of the spent fuel management and of the radioactive waste. The results of all of these activities have been used in formulating the 2008–2009 subprogramme.

Objectives:

— To enhance Member State capabilities in the management of radioactive waste, including disused sealed sources, through implementation of safe and cost effective approaches and technologies for the predisposal and near surface disposal of radioactive waste and to build confidence in technologies and approaches developed for the geological disposal of high level waste.

— To enhance Member State capabilities in the management of spent nuclear fuel when declared as waste.

Outcome	Performance Indicators
— Up to date safety standards and technical documents and improvements in pre-disposal waste management and disposal practices, including disused sealed sources and spent nuclear fuel when declared as waste.	— Extent of use by Member States of standards and guidance provided . — Number of requests for appraisals and peer reviews on management of either low and intermediate level waste or high level waste.

Programmatic changes and trends: After the development of a coherent suite of safety standards, there is now a need to shift toward the application of these standards by Member States. Building capacity, both on the regulatory side and on the operator side, will be the main focus of the programme. Practical guidance will be provided by the Agency and the transfer of know-how and technology to developing Member States will be promoted.

In the recent past, an interest in multinational cooperation has been expressed by a number of countries which are not in a favourable position to implement self-sufficiently national nuclear waste management programmes. The concept of regional disposal facility for radioactive waste shared by several countries has been debated at several Agency meetings and conferences, and has also been discussed by an international Expert Group on Multilateral Nuclear Approaches for the Nuclear Fuel Cycle, established by the Director General. The programme will accompany the Agency's initiative by addressing the issues relevant to multinational or regional disposal approaches.

Spent nuclear fuel when declared as waste was up to now never included in the safety standards related to radioactive waste management. Through extrabudgetary funding, the subprogramme has assessed the need for standards to be developed and applied. This activity needs now to be undertaken under the regular budget as a supplementary activity for the subprogramme; it will also address the management of NORM waste.

Resource changes and trends: The proposed resources reflect a minor increase (€17 164) in 2008 as compared with 2007 and a decrease of 1.5% (€43 000) in 2009 as compared with 2008. Funds within this subprogramme had to be re-assigned to accommodate the new project, Improving the safety of spent nuclear fuel management. The net decrease in 2009 is due to the need to move funds to Subprogramme 3.4.4 Decommissioning of Installations and Remediation of Sites owing to its high priority.

3.4.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	3 044 618	3 000 622
Extrabudgetary	428 695	428 695
Unfunded	51 500	21 500

Projects

Title, duration and priority	Main outputs
3.4.2.1 Developing a globally harmonized safety approach for the management of radioactive waste ***Duration:*** 2006–2010 ***Priority:*** 1	Safety Guide on classification of radioactive waste and longer term storage of radioactive waste; consolidated Safety Requirements on disposal and finalisation of the supporting Safety Guides on near surface and geological disposal; Safety Guide on safety assessment; harmonized safety assessment methodologies; reports of peer review of the safety of disposal facilities.
3.4.2.2 Improving the safety of spent nuclear fuel management ***Duration:*** 2006–2010 ***Priority:*** 1	Reports on licensing issues for the long term management of spent fuel, in particular on how to foresee the behaviour of spent fuel, containers and buildings and to ensure retrievability and transportability after storage and safe disposal; harmonised licensing approaches in Member States; Safety Guides and other types of reports published.
3.4.2.3 Implementing sustainable waste management strategies and programmes ***Duration:*** 2006–2011 ***Priority:*** 2	Publications on: lessons learned and technical requirements for long term storage of radioactive waste, modular design of low level waste (LLW) processing and storage facility, international experience in the determination and use of scaling factors in waste characterization, and organization, principles and technical options for waste minimization; processing and conditioning of high level waste (HLW) including spent nuclear fuel encapsulation, mixed waste management concepts, mobile processing technologies and systems for radioactive waste management, and reference design for LLW from nuclear applications and/or disused sealed radioactive sources.

Title, duration and priority	Main outputs
3.4.2.4 Strengthening capabilities for the disposal of radioactive waste ***Duration:*** 2006–2012 ***Priority:*** 2	New network of radioactive waste management centres similar to the Network of Centres of Excellence for geological disposal established in 2002; publications on best practices and state of the art technologies for radioactive waste disposal; practical guidance on management of NORM; technical guidance on the BOSS borehole system for the disposal of disused radioactive sources.
3.4.2.5 Management of disused sealed radioactive sources ***Duration:*** 2006–2012 ***Priority:*** 1	Conditioning of sealed sources and their safe and secure storage; technical procedures for sealed radioactive source management as well as computerized systems for record-keeping of waste inventories; national and international radioactive waste management teams trained; updated technical documents.

Subprogramme 3.4.3 Assessment and Control of Radioactive Discharges to the Environment

Rationale: The Agency has a long tradition of establishing and providing for the application of international safety standards related to the control, assessment and monitoring of discharges of radioactive substances to the environment. Current and forthcoming changes in ICRP recommendations and international practices in application of the international standards, as well as a recently initiated revision of the Agency's BSS, justify further development of standards for protection of the public and the environment from radioactive materials and waste discharged to the environment. After approval in 2005 of the International Plan of Activities on the Radiation Protection of the Environment, the Agency has become the coordinator of the international effort in this domain.

Although an international standard for environmental and source monitoring of radionuclides has been recently developed and published, there remain a number of issues where specific guidance is needed. A consistent approach to assist Member States in the monitoring of radionuclides in food and drinking water to comply with international standards should be developed. The worldwide repository of records on radioactive discharges to the environment should be maintained and further developed for the benefit of Member States.

Several international organizations are involved in the control of pollutants in the environment and, because of its recognized competence in this field, the Agency must continue to interact with and advise such organizations in relation to radioactive materials in the environment.

Objective: To strengthen Member State ability to control discharges of radioactive materials to the environment and to assess their impact on the public and the environment.

Outcome	Performance Indicators
— International consensus on policies for the radiation protection of the public and the environment.	— New or revised guidance applied on the radiation protection of the public and the environment in accordance with relevant international action plans.

Programmatic changes and trends: An important effort will be to promote the application of safety standards to control and monitor radioactive discharge for all facilities producing radioactive effluents regardless of the volume. More and more requests are received from Member States to support their effort to adequately monitor food and water both for public protection and international trade. In this field too, the application of international standards will be promoted. The subprogramme now includes a project on the best available technologies for radioactive effluent treatment.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 6.6% (€50 710) in 2008 as compared with 2007, and a slight increase in 2009 as compared with 2008, due to increased emphasis being placed on the application of standards and promoting their effective implementation in Member States. Savings in other areas of the programme have been redeployed to strengthen activities in this subprogramme, including the new project, minimizing and processing radioactive effluents.

3.4.3	2008 *at 2008 prices*	2009 *At 2008 prices*
Regular Budget	846 673	855 861
Extrabudgetary	—	—
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.4.3.1 Controlling the exposure of humans and non-human species from ionizing radiation ***Duration:*** 2006–2010 ***Priority:*** 1	Safety requirements for radioactive discharge (to be developed for incorporation into the new BSS planned for 2009); revised Safety Guide for radioactive discharge control; publications on methods of biota doses assessment based on best national experience and new developments; reports on the Agency's responses to specific requests made by international legal instruments (London Convention, regional and international undertakings, such as the OSPAR Convention) on matters related to radioactive waste.
3.4.3.2 Achieving international agreement on modelling environmental radionuclide transfer and doses to humans and non-human species ***Duration:*** 2006–2010 ***Priority:*** 2	Final report from the project on Environmental Modelling for Radiation Safety (EMRAS); Member State staff trained in environmental impact assessment.
3.4.3.3 Minimizing and processing radioactive effluents ***Duration:*** 2008–2012 ***Priority:*** 2	Publications on: decay storage of radioactive effluents from medical and other institutional applications; and on liquid and gaseous effluents from nuclear reactors.

Subprogramme 3.4.4 Decommissioning of Installations and Remediation of Sites

Rationale: Residual radioactive materials are being accumulated from a range of nuclear activities, including the decommissioning of nuclear sites and installations and from the remediation of sites affected by previous nuclear activities. These areas, facilities and material must be managed in ways that remove potential sources of risk to the immediate human environment.

Many smaller research facilities such as research reactors and laboratories await decommissioning; many of these are in countries with inadequate infrastructures, insufficient funds and little expertise. International assistance should be marshalled to help ensure that the decommissioning of these facilities is accomplished safely. As experience is gained with the decommissioning of nuclear facilities, the decommissioning safety standards must be updated to reflect the safety lessons learned.

Areas affected by radioactive residues exist in many parts of the world as a result of previous civil and military nuclear activities. The radiological conditions at the sites need to be assessed to determine the need for continuing restrictions or for possible remediation and the removal of restrictions.

The residual radioactive materials that are being accumulated from a range of nuclear activities must be managed in ways that remove potential sources of risk to the immediate human environment. In addition, the need to regulate and manage NORM resulting from industrial practices is a matter of concern to Member States. The radiation exposure to the public from different industries that use or generate NORM can be significant and needs to be considered as part of the overall radiation protection regime.

With the Action Plan, based on the findings of an international conference in 2002 and approved by the Board of Governors in 2004, the Agency will implement its statutory obligations in this field by strengthening its positions related to safe decommissioning. The Action Plan also provides a focus on important activities to be accomplished in the field.

Objectives:

— To strengthen the safe decommissioning of nuclear facilities in Member States and the release or remediation of sites affected by radioactive residues.

— To enable Member States to use methods and technologies for the safe decommissioning, site remediation and disposition of resulting residual radioactive materials through the provision of up-to-date information, advice and assistance, where appropriate.

Outcomes	Performance Indicators
— Improvement of practices in the decommissioning of installations and remediation of sites.	— Extent of use of safety standards and of supporting technical documents by Member States for the improvement of practices.
— Implementation of Agency recommendations for the improvement of practices in the decommissioning of installations and remediation of sites.	— Number of appraisal, peer-review and technical assistance requested by Member States for decommissioning and remediation.

Programmatic changes and trends: One specific aspect of decommissioning or remediation programmes in the majority of Member States is that they deal with small research or medical facilities or with one unique nuclear installation or one single site. It is therefore difficult for a Member State in this context to develop its own expertise and capability. To face this difficulty, the Agency will set up demonstration projects on the decommissioning of different types of small facilities which will effectively follow all the steps of an effective decommissioning and be used as a training centre for Member States owning these small facilities.

Based on the findings and recommendations from the 2006 international conference on decommissioning, held in Athens, the Agency will facilitate the transfer of information and know-how in the decommissioning area through the establishment of a new international network of decommissioning centres. The network will provide case studies for practical training on the decommissioning of research reactors, nuclear installations and other facilities.

The Agency is organizing support to both Iraqi regulatory authority and Iraqi nuclear operators to address radiological protection of the public in former Iraqi nuclear sites. The planning for the decommissioning and site remediation programme will represent a large part of this support.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 2.1% (€25 627) in 2008 as compared with 2007, and an increase of 3.3% (€42 300) in 2009 as compared with 2008, due to increased emphasis being placed on the application of standards and promoting their effective implementation in Member States. Savings in other areas of the programme have been redeployed to strengthen activities in this subprogramme.

3.4.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 299 809	1 343 455
Extrabudgetary	755 000	770 000
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.4.4.1 Developing and implementing guidance on the safe termination of nuclear activities ***Duration:*** 2006–2010 ***Priority:*** 1	Updated Safety Guides on decommissioning to reflect the new Safety Requirements; Safety Report on compliance monitoring for release of material and remediation of sites after decommissioning; Member State personnel trained and information provided on decommissioning of facilities using radioactive material; proceedings of the international conference on lessons learned during the planning and implementation of decommissioning.

Title, duration and priority	Main outputs
3.4.4.2 Regulating and remediating environments with radioactive residues including residues from naturally occurring radioactive material (NORM) ***Duration:*** 2006–2010 ***Priority:*** 1	Safety Guide on the safe management of NORM in the environment; Member State personnel trained on the safe management of NORM.
3.4.4.3 Facilitating the transfer of sustainable technologies for decommissioning of facilities ***Duration:*** 2006–2012 ***Priority:*** 2	Technical report on long term preservation of information in deferred decommissioning projects; publications on: stakeholders' involvement in decommissioning projects with a focus on countries with limited resources; societal issues in decommissioning; technologies in Member States; decommissioning of small facilities; practical experience on the reuse of decommissioned sites; decommissioning strategies.
3.4.4.4 Promoting technologies for remediation of contaminated sites ***Duration:*** 2006–2012 ***Priority:*** 2	Technical publications; syllabus for training in environmental remediation methodologies and technologies; brochure on environmental remediation related matters to increase outreach to stakeholders.

Programme 3.5 Nuclear Security

Rationale: International terrorism and multinational crime is a growing concern for the international community. It is becoming wider in international scope and organization, and there is evidence of long term planning. The international community has responded to these threats by strengthening existing international legal instruments and adopting new ones relating to nuclear security, namely an amendment in July 2005 to the Convention on the Physical Protection of Nuclear Material (CPPNM); the International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Convention); UN Security Council Resolution 1540 (and UNSC Resolution 1673); UNSC Resolution 1373; and, the non-binding Code of Conduct on the Safety and Security of Radioactive Sources and its Guidance on the Import and Export of Radioactive Sources.

This programme is based on an evaluation of the potential threat from malicious acts involving nuclear and other radioactive material in use, storage or transport. This threat ranges from the theft of nuclear material for weapons purposes to dispersion of radioactive (including nuclear) material to cause radiological damage to persons, property or the environment. The threat may include the use of a radiological dispersion device (RDD, a so called "dirty bomb") or as a result of an act of sabotage at a nuclear facility or transport. In addition, sources that have fallen out of regulatory control, referred to as "orphan sources", may, if found by terrorists, be used in RDDs. The planned activities include measures for prevention, detection and response, moving sensitive materials, for example radioactive sources to safe and secure locations, as well as engineering measures as part of the physical protection of nuclear installations. In combination, these activities aim to provide a comprehensive approach to nuclear security.

In September 2005, the Board of Governors considered and approved a new Nuclear Security Plan covering the period 2006–2009 (GOV/2005/50). This new plan builds on the accomplishments of the first plan, reviews the threat as it has evolved since the establishment of the first plan and promotes the implementation of strengthened international instruments to combat the threat of nuclear or radiological terrorism. The new plan covers three activity areas: needs assessment, analysis and coordination; prevention; detection and response.

The overall goal of the programme is consistent with the IAEA Nuclear Security Plan for 2006–2009 and the new international security framework. The Agency will continue to act as the authoritative international centre for the development of nuclear security guidelines and in support of their implementation, including the comprehensive provision of expert advice, training, technical measures, advisory service missions and other assistance for the benefit of States. The Agency will seek to foster collaboration and cooperation, and information exchange with international bodies concerned with responsibilities in areas related to nuclear security, providing a systematic, comprehensive approach to enhancing nuclear security.

Objective: To improve the worldwide security of nuclear material, other radioactive material and their associated nuclear facilities, in use, storage and transport, through support and assistance to Member States for the establishment of effective national nuclear security regimes.	
Outcomes	**Performance Indicators**
— Improved global security of nuclear material, other radioactive material, nuclear facilities, locations and transports.	— Number of States implementing recommendations made, inter alia, through the Agency's Nuclear Security Advisory Service. — Improved nuclear security arrangements for nuclear and other radioactive materials and their associated facilities.
— Improved capability of Member States to detect and respond to malicious acts involving nuclear material, other radioactive material, nuclear facilities, locations or nuclear transports.	— Number of States implementing procedures and technical systems obtained through Agency sources to detect and respond to malicious acts involving nuclear and other radioactive material in use, storage and transport.
— Comprehensive and coherent approach to nuclear security to reduce the overall risk that malicious acts against nuclear and other radioactive material in nuclear facilities and transports could cause to the public, environment or property.	— Number of States that implement nuclear security for activities with nuclear and other radioactive materials in a comprehensive and coherent way.

Follow-up on programme-wide lessons learned from reviews, assessment, evaluations: In designing the programme for 2008–2009, account has been taken of lessons learnt during the implementation of the first nuclear security plan and of comments made by the External Auditor. In 2008–2009, greater emphasis will be placed on human resource development, coordination and prioritization.

3.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 107 381	1 107 380
Extrabudgetary	15 500 042	15 500 042
Unfunded	—	—

Specific criteria for prioritization:

1. First priority will be given to activities that provide for the establishment of improved security in Member States, including development of an international nuclear security framework.
2. Second priority will be given to activities that relate to research and development that contribute to improving nuclear security methodologies.
3. Third priority will be given to the coordination between Agency programme activities and those of international organizations and other donors that have related programmes.

Subprogramme 3.5.1 Assessing Nuclear Security Needs, Threat Analysis and Coordination

Rationale: To underpin the effective implementation of the Agency's activities to assist Member States in meeting the obligations of the strengthened security instruments effective and efficient mechanisms for planning, prioritization, coordination, monitoring and reporting are required. Planning and prioritization are based on requests from Member States and assessments of needs. Needs are determined, in collaboration with Member States, by Agency missions and information analysis. Relevant information is also collected from all other available sources, including the Illicit Trafficking Data Base (ITDB) and from other international organizations, and provides a basis for, inter alia, analysing potential threats.

The ITDB, to which Member States contribute information, is an important information resource tool for identifying potential threats, for identifying possible vulnerabilities and weaknesses in control and security systems, and for assessing the impact of measures to combat illicit trafficking. Expansion of information resources and their analysis will extend their contribution to threat analysis and needs assessment.

Assessments of the security needs in individual Member States are, in cooperation with the State involved, brought together in Integrated Nuclear Security Support Plans (INSSPs). These identify the actions to be taken, the planned implementation schedule and responsibilities. INSSPs also provide a vehicle for coordination of implementation activities with both the State and other donors. They provide, therefore, the means by which bilateral, multilateral and national activities can be integrated and resources effectively and efficiently applied.

Coordination with both bilateral donors and other international organizations with activities which contribute to enhancing nuclear security is required to ensure that limited resources are efficiently and effectively applied, that unnecessary duplication of effort is avoided, gaps are identified and that prioritization is soundly based.

The nuclear security programme involves activities delivered under other major programmes of the Agency and through the technical cooperation programme. Mechanisms are necessary to ensure the required internal coordination of their implementation and funding.

Objectives:

— To have a comprehensive set of information which effectively supports implementation of the Nuclear Security Plan.
— To understand nuclear security needs on a global scale to assist in the prioritisation of those needs and to identify areas of cooperation between the Agency and States.
— To understand illicit global trafficking trends and patterns, including theft and other malicious acts involving radioactive material and to use that understanding to enhance the Agency's ability to prioritize programmes and achieve an effective, efficient and focused nuclear security programme.
— To fully coordinate the nuclear security support programmes of Member States and international organisations with those of the Agency.

Outcomes	Performance Indicators
— A coordinated nuclear security programme which efficiently and effectively meets the requirements of Member States.	— Degree of coherence and transparency in the implementation of nuclear security activities.
— Improvements of exchange of reliable and relevant information with Member States and other international organizations, including joint activities, focusing on efficient use of resources.	— Number of collaborating partners in the Agency and in other organizations and the level of their participation. — Quantity and quality of information and data related to nuclear security provided to the Secretariat, Member States and other organizations.

Programmatic changes and trends: There has been a sharp increase in the need for information relevant to nuclear security. The need for effective internal and, in particular, external coordination has also increased in order to optimize resources. Demand has also increased for the effective use of available information for threat assessment, and in support of planning and implementing nuclear security activities in States. There is a continued increase in the requests for updated complete and reliable information on illicit trafficking, theft and threats of acts in which nuclear material and other radioactive material in nuclear facilities and transports could be used for malicious purposes. Analysis of the results of the various nuclear security services that the Agency has offered during the past years has revealed an urgent need to implement actions that would provide for improved security. Maintenance of the ITDB will be performed in Project 4.1.2.2, IT Application Support, using the infrastructure established with funding from the Nuclear Security Fund (NSF).

Resource changes and trends: The proposed regular budget resources, in real terms, reflect an increase of 9.1% (€35 090) in 2008 as compared to 2007 and no change in 2009 as compared with 2008, due to a transfer of funds from the other subprogrammes to provide support for the increased NSF activity in this subprogramme.

3.5.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	433 621	433 620
Extrabudgetary	2 400 001	2 400 001
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.5.1.1 Assessing nuclear security needs, priorities and threats ***Duration:*** 2008–2009 ***Priority:*** 1	Databank on: seizures and malicious acts such as thefts and sabotages involving or threatening to involve nuclear and other radioactive materials, in use, storage or transport, as well as sensitive nuclear equipment used to provide such materials; acts or attempts to construct or use nuclear and/or other radioactive materials (e.g. a source) for a nuclear or a radiological dispersion device; periodic reports with analysis of cases, trends and materials involved in illicit trafficking and other malicious acts involving nuclear and other radioactive materials; a web page on nuclear security, with information of statistics and trends in illicit trafficking and of selected cases; timely responses to questions asked by media or by the general public; contributions to INSSPs for individual States.
3.5.1.2 Coordinated nuclear security activities with Member States ***Duration:*** 2008–2009 ***Priority:*** 1	Nuclear security support and cooperation arrangements between the Agency and individual Member States; improved coordination between activities performed by the Agency and through bilateral nuclear security support; reports on the implementation of the nuclear security programme including the specific reports required for States providing financial contributions to the NSF.
3.5.1.3 Providing consistency and coherence of nuclear security activities and programmes ***Duration:*** 2008–2009 ***Priority:*** 1	Cooperative arrangements which reflect the increased level of interaction with other international organizations; joint technical and implementation reports on common topics and joint activities, which will improve the outreach of the Agency's programme.

Subprogramme 3.5.2 Preventing Malicious Activities Involving Nuclear and Radioactive Materials and their Associated Facilities

Rationale: This subprogramme aims to support global implementation of the Agency's new nuclear security plan, set out in the rationale to Programme 3.5, in both Member States and non-Member States. An essential element in the first line of defence is to establish effective security arrangements such as physical protection of nuclear materials and their associated facilities when in use, storage and transport. Similarly, security, such as accurate accounting of other radioactive materials, including radiation sources and radioactive waste, requires protection against malicious, criminal or terrorist access. States and international organizations must continue to address these concerns at both the national and the international levels in support of a comprehensive international nuclear security regime. The Agency has a central role in promoting and implementing activities that will improve the ability of States to prevent malicious activities involving nuclear and other radioactive material and their associated facilities from occurring.

Appropriate and effective accounting for nuclear material, as well as of other radioactive materials, is a fundamental part of adequate security arrangements for such material. It will be the basis for physical protection, for the early detection of theft and for domestic as well as international export and import control measures. The establishment of effective accounting systems will be harmonized with work performed in Project 4.1.2.14, States Systems of Accounting for and Control of Nuclear Material (SSACs).

Efforts to strengthen the physical protection regime will continue. The improvement of physical protection of nuclear and other radioactive material in use, storage and transport and of vital areas of nuclear installations requires dedicated support both through the Agency's programmes and through bilateral nuclear security support. A modular approach to the Agency's nuclear security services will deliver services tailored to the wishes of the individual State. INSSP will include the implementation of relevant recommendations for nuclear security improvements. A strengthened implementation of these plans, in full coordination with bilateral support programmes, will ensure improved prevention against malicious acts involving nuclear and other radioactive material. These measures will be supported by work to encourage complementary efforts amongst international bodies aimed at preventing malicious activities involving nuclear and radioactive material and their associated facilities. Increased efforts will be devoted to measures to ensure the sustainability of effective nuclear security.

Objectives:

— To obtain universal adherence or political commitments by States to the amended CPPNM, the Code of Conduct and other relevant binding and non-binding international instruments.

— To achieve effective protection, control, accountancy and registry of all nuclear and other radioactive material and associated facilities, as requested, within a State.

Outcomes	Performance Indicators
— Strengthened physical protection of nuclear and other radioactive material in use, storage and transport.	— Demonstrated improvement in physical protection and other security arrangements for nuclear and other radioactive material in use, storage and transport, inter alia, through implementation of INSSPs.
— Internationally accepted nuclear security framework with guidelines and recommendations for physical protection and related accountability of nuclear and other radioactive material, in use, storage and transport.	— Number of internationally accepted publications issued in the IAEA Nuclear Security Series.
— Improved physical protection of nuclear installations and the effective use of engineering measures for this purpose.	— Number of facilities that have implemented improved physical protection through Agency coordination and support.

Programmatic changes and trends: Requests by Member States for Agency nuclear security services continues to grow, as do requests for assistance with the implementation of the recommendations made during these services. Awareness has also grown significantly that a comprehensive set of nuclear security guidelines and recommendations is needed as a platform for work both within Member States and by the Agency. In addition, greater emphasis is being given to human resource development in all regions to address sustainability of nuclear security in States.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect a decrease of 13.9% (€71 418) in 2008 as compared to 2007 and no change in 2009 as compared with 2008, due the need to transfer funds to Programme 3.1, Incident and Emergency Preparedness and Response in accordance with GC(50)/RES/10, and to Subprogramme 3.5.1, Assessing Nuclear Security Needs, Threat Analysis and Coordination, to provide support for the increased NSF activity there.

3.5.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	452 946	452 946
Extrabudgetary	6 650 002	6 650 002
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.5.2.1 Developing guidelines and recommendations for the prevention of malicious acts ***Duration:*** 2008–2009 ***Priority:*** 1	New and revised recommendations and guidance included in the IAEA Nuclear Security Series on: physical protection, accurate accounting and other security arrangements for nuclear material and other radioactive materials in use, storage and transport, protection of nuclear power plants and their vital areas, research installations with research reactors, laboratories and waste management areas; nuclear fuel cycle facilities, protection of radioactive material in non-nuclear applications and for material in installations with a mix of different activities, nuclear and non-nuclear, nuclear security of radioactive materials in waste storage and in depositories; improved methodologies for developing a general design basis threat applicable for both nuclear material and for other radioactive material; implementing a security culture and a graded approach to the nuclear security of different material and applications; implementing the defence in depth concept and addressing the protection of sabotage of nuclear and other radioactive material in use, storage and transport.

Title, duration and priority	Main outputs
3.5.2.2 Supporting implementation of the nuclear security framework to prevent malicious acts ***Duration:*** 2008–2009 ***Priority:*** 1	Improved technical and administrative systems for protection and accountability of nuclear and other radioactive materials as a result of support provided by the Agency, and through bilateral programmes; a comprehensive programme for nuclear security training, including for physical protection and material accountability, as needed for security purposes.
3.5.2.3 Providing nuclear security services for prevention of malicious acts ***Duration:*** 2008–2009 ***Priority:*** 1	Provision of modular nuclear security services to States design basis threat (DBT) workshops.

Subprogramme 3.5.3 Detecting and Responding to Malicious Activities involving Nuclear and other Radioactive Material

Rationale: The new and strengthened nuclear security international instruments, in particular the Nuclear Terrorism Convention, recognize the potential for proliferation or for the construction of a radioactive dispersal device (RDD) using nuclear or radioactive material obtained unlawfully by non-State actors, and the need for State Parties to detect and report such acts. The international instruments also point to recommendations and functions of the Agency to prevent such acts.

Through this subprogramme, the Agency seeks to underpin Member State responses to the threats as they fulfil their obligations under the new nuclear security instruments. Specifically, Member States must have the best achievable capacity to detect and respond to the theft, the threat of theft, or fraudulent possession, transfer, including illicit trafficking, as well as dispersal and disposal of nuclear and other radioactive material and of sensitive nuclear equipment and technology for the production of these materials. Detection of such acts is an essential part of nuclear security systems, should preventive measures fail. Continued reports of nuclear trafficking incidents indicate a need to strengthen State capability to combat illicit trafficking in nuclear and other radioactive material. Improved coordination amongst organizations involved both within States and in the international community is required, as is further development of the technology to make available user-friendly instruments for detection and a methodology for nuclear forensic or other purposes.

Staff in national organizations, including law enforcement organizations, need to be well trained to understand the problems, to use detection instruments and to know how to respond to malicious acts. States request international assistance to help them assess existing detection systems and techniques and to obtain support to improve them. Establishing effective nuclear security cultures in States will contribute positively to these efforts. These elements to build capacity for detection will be included in INSSPs.

Currently, there are insufficient internationally accepted guidelines and recommendations available to States for detecting and responding to unlawful activities in this regard. In addition there is no existing Agency service to assist States in assessing their detection and response capabilities. Guidelines and recommendations will be established to provide a sound basis for enhanced capability in States to detect and respond to malicious acts involving nuclear and other radioactive material. They will also provide the basis for Agency services to States in detection and response. The Agency will support their implementation through actions included in integrated nuclear security support plans.

Objectives:

— To enhance capabilities of States to detect, interdict and respond to illegal acts involving nuclear and other radioactive material and associated facilities.

— To make internationally accepted guidance and technical information available to States that will assist them, upon request, in their efforts to detect and respond to unlawful use/possession of nuclear and other radioactive material; and in their efforts to protect against and respond to nuclear terrorism at large public events or during the transport of nuclear or other radioactive material.

Outcomes	Performance Indicators
— Increased capability to detect malicious activities involving nuclear and other radioactive materials.	— Number of countries in which border monitoring is implemented and new procedures are in place as a result of Agency assistance.
— Improved State capability to respond to malicious acts involving nuclear and other radioactive materials in use, storage and transport.	— Number of countries implementing procedures to respond to malicious acts involving nuclear and other radioactive materials.

Programmatic changes and trends: The Agency is increasingly being asked to assist in strengthening Member State detection and response systems against potential terrorist or other criminal use of nuclear and other radioactive material. There will be an increased focus on the development of internationally accepted guidance to address these issues and assistance to States in their implementation of such guidance. The development of technology and instruments for border monitoring will be promoted in cooperation with work performed in Project 4.1.2.1, Instrument Development and Field Support, using the available infrastructure with funding from the NSF.

Resource changes and trends: The proposed regular budget resources, in real terms, reflect a decrease of 6.0% (€13 672) in 2008 as compared to 2007 and no change in 2009 as compared with 2008, due to the need to transfer of funds to Subprogramme 3.5.1, Assessing Nuclear Security Needs, Threat Analysis and Coordination, to provide support for the increased NSF activity.

3.5.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	220 814	220 814
Extrabudgetary	6 450 039	6 450 039
Unfunded	—	—

Projects

Title, duration and priority	Main outputs
3.5.3.1 Developing guidelines and recommendations for detection and response to malicious acts ***Duration:*** 2008–2009 ***Priority:*** 1	Guidelines and recommendations for detection and response to malicious acts involving nuclear and other radioactive material; improved technology and methodology for detection; development of a network of laboratories to assist States in the identification and characterization of nuclear and other radioactive material.
3.5.3.2 Providing nuclear security services for detection and response to malicious acts ***Duration:*** 2008–2009 ***Priority:*** 1	Increased use of Agency services to improve Member State capabilities for detection and response to malicious acts; input into INSSPs.
3.5.3.3 Supporting implementation of the nuclear security framework for detection and response to malicious acts. ***Duration:*** 2008–2009 ***Priority:*** 1	Training and equipment to detect and respond to malicious acts involving nuclear and other radioactive material, non-nuclear material and sensitive equipment that may be used for the production of such material; detection instruments provided by the Nuclear Security Equipment Laboratory (NSEL); results of nuclear forensics analysis, as required for seized material.

Major Programme 3 - Nuclear Safety and Security

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 16

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
3.0.0.1	Overall management, coordination and common activities	913 158	2 621 943	-	914 176	2 621 943	-
		913 158	**2 621 943**	**-**	**914 176**	**2 621 943**	**-**
3.1.1.1	Enhancing national and regional preparedness for responding to radiation incidents and emergencies	409 833	512 008	34 485	406 908	512 008	28 000
3.1.1.2	Enhancing arrangements for incident and emergency reporting and knowledge sharing	305 082	151 178	-	322 992	151 178	-
	Subprogramme 3.1.1 - Enhancing Member State Preparedness and Response Capabilities	**714 915**	**663 186**	**34 485**	**729 900**	**663 186**	**28 000**
3.1.2.1	Operating and enhancing the Secretariat's incident and emergency system	534 165	141 178	174 065	477 573	141 178	95 500
3.1.2.2	Strengthening and enhancing interagency/intergovernmental arrangements	82 003	253 381	-	88 231	289 217	-
3.1.2.3	Increasing and sustaining awareness of IEC capabilities, services and products - Strengthening IEC Outreach	98 559	168 644	21 450	114 299	168 644	6 500
	Subprogramme 3.1.2 - Enhancing Preparedness and Response Capabilities of International Organizations	**714 727**	**563 203**	**195 515**	**680 103**	**599 039**	**102 000**
Programme 3.1 - Incident and Emergency Preparedness and Response		**1 429 642**	**1 226 389**	**230 000**	**1 410 003**	**1 262 225**	**130 000**
3.2.1.1	Enhancing regulatory effectiveness and independence in Member States	586 322	275 529	-	622 670	275 529	-
3.2.1.2	International Regulatory Experience Sharing Centre	255 932	154 931	-	247 306	154 931	-
	Subprogramme 3.2.1 - National Regulatory Framework and Approaches to Enhance Regulatory Effectiveness	**842 254**	**430 460**	**-**	**869 976**	**430 460**	**-**
3.2.2.1	Maintaining and enhancing the quality of the Agency safety standards for the safety of nuclear installations	494 570	75 435	-	496 534	75 435	-
3.2.2.2	Providing support to the CNS, INSAG, and coordinating with other international organizations	288 126	-	-	229 072	-	-
3.2.2.3	Enhancing Member States capabilities in nuclear safety by promoting an integrated approach to safety as well as standards and services in the area of management systems	679 469	15 000	-	690 013	-	-
3.2.2.4	Supporting Member States in developing and maintaining nuclear safety infrastructure	663 957	355 000	-	632 838	355 000	-
	Subprogramme 3.2.2 - National and Global Nuclear Safety Programme Enhancements	**2 126 122**	**445 435**	**-**	**2 048 457**	**430 435**	**-**
3.2.3.1	Assist in harmonizing the use of advanced safety analysis methods for existing nuclear installations and for future designs	648 657	526 893	-	623 259	256 349	-
3.2.3.2	Probabilistic safety analysis and risk informed applications for existing nuclear installations and for new build facilities	458 362	70 077	-	448 268	70 077	-
3.2.3.3	Fostering technical developments and trends in safety analyses	406 502	141 426	-	425 342	141 426	-
	Subprogramme 3.2.3 - Development and Use of Advanced Safety Assessment: Methods and Applications	**1 513 521**	**738 396**	**-**	**1 496 869**	**467 852**	**-**
3.2.4.1	Providing for the site safety and the evaluation of external and internal hazards for nuclear facilities	545 422	491 703	-	566 863	491 703	-
3.2.4.2	Providing for safe design of evolutionary and innovative nuclear power plants	614 586	589 522	-	619 164	33 612	-
	Subprogramme 3.2.4 - Engineering Safety for Site Evaluation, Design and Long Term Operation	**1 160 008**	**1 081 225**	**-**	**1 186 027**	**525 315**	**-**

Major Programme 3 - Nuclear Safety and Security

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 16

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3.2.5.1	Enhancing the operational safety performance of nuclear power plants	1 005 623	122 401	-	1 022 217	122 401	-
3.2.5.2	Strengthening the exchange and utilization of international operating experience feedback	636 051	140 000	-	649 207	140 000	-
	Subprogramme 3.2.5 - Operational Safety and Effective International Operating Experience Feedback	**1 641 674**	**262 401**	**-**	**1 671 424**	**262 401**	**-**
3.2.6.1	Enhancing the safety of research reactors	534 853	272 405	-	551 965	272 405	-
3.2.6.2	Monitoring and safety enhancement of research reactors under agreement	160 564	46 471	-	170 496	46 471	-
3.2.6.3	Fostering international exchange of information on research reactor safety aspects	97 347	-	-	100 630	-	-
3.2.6.4	Enhancing the safety of Fuel Cycle Facilities (FCF)	302 468	60 000	-	302 468	60 000	-
	Subprogramme 3.2.6 - Safety of Research Reactors and Fuel Cycle Facilities	**1 095 232**	**378 876**	**-**	**1 125 559**	**378 876**	**-**
Programme 3.2 - Safety of Nuclear Installations		**8 378 811**	**3 336 793**	**-**	**8 398 312**	**2 495 339**	**-**
3.3.1.1	Developing and maintaining radiation safety standards in general radiation protection, including a revision of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS)	590 747	45 261	-	590 746	45 261	-
3.3.1.2	Developing and maintaining safety standards and guidance for public exposure and emergency exposure situations	193 005	-	-	193 005	-	-
3.3.1.3	Developing and maintaining standards, guidance and international undertakings related to the control of radiation sources	706 017	-	-	705 974	-	-
3.3.1.4	Developing and maintaining safety standards and guidance for occupational exposures	345 546	-	-	345 546	-	-
	Subprogramme 3.3.1 - Developing Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources	**1 835 315**	**45 261**	**-**	**1 835 271**	**45 261**	**-**
3.3.2.1	Strengthening national regulatory infrastructure	383 660	679 625	-	383 591	694 625	-
3.3.2.2	Implementing a strategy for sustainable education and training	386 828	158 131	-	386 827	158 131	-
3.3.2.3	Promoting and implementing a harmonized application of the radiation safety standards	746 324	-	-	746 324	-	-
3.3.2.4	Promoting and facilitating the implementation of international undertakings for the control of radiation sources	226 444	610 097	-	226 445	610 097	-
3.3.2.5	Rendering radiation protection and monitoring services to the Agency's own operations	321 271	-	-	321 271	-	-
	Subprogramme 3.3.2 - Strengthening Regulatory Infrastructure and Harmonizing the Application of the Radiation Safety Standards	**2 064 527**	**1 447 853**	**-**	**2 064 458**	**1 462 853**	**-**
3.3.3.1	Optimizing radiological protection of patients in diagnostic and interventional procedures using X rays	509 169	-	-	509 127	-	-
3.3.3.2	Optimizing radiological protection of patients in nuclear medicine and avoiding accidental exposure in radiotherapy	164 543	-	-	164 527	-	-
	Subprogramme 3.3.3 - Radiological Protection of Patients	**673 712**	**-**	**-**	**673 654**	**-**	**-**

Major Programme 3 - Nuclear Safety and Security

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 16

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
3.3.4.1	Reviewing and revising the international regulations for the safe transport of radioactive materials and associated guidance	343 531	94 000	-	343 460	58 000	-
3.3.4.2	Incorporating regulations for the safe transport of radioactive material into the UN Recommendations for Safe Transport of Dangerous Goods and the Modal Regulatory Requirements of ICAO and IMO	210 839	-	-	210 839	-	-
3.3.4.3	Appraising compliance with the safety standards for the transport of radioactive materials	231 390	653 000	-	231 370	648 000	-
	Subprogramme 3.3.4 - Safety of the Transport of Radioactive Material	**785 760**	**747 000**	**-**	**785 669**	**706 000**	**-**
Programme 3.3 - Radiation and Transport Safety		**5 359 314**	**2 240 114**	**-**	**5 359 052**	**2 214 114**	**-**
3.4.1.1	Servicing the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and developing waste safety standards	550 468	130 174	-	550 672	130 174	80 000
3.4.1.2	Facilitating exchange of information on radioactive waste management	585 854	-	-	577 141	-	-
	Subprogramme 3.4.1 - Development of an International Safety Regime for the Management of Radioactive Waste	**1 136 322**	**130 174**	**-**	**1 127 813**	**130 174**	**80 000**
3.4.2.1	Developing a globally harmonized safety approach for the management of radioactive waste	879 617	428 695	-	879 650	428 695	-
3.4.2.2	Improving the safety of spent nuclear fuel management	27 927	-	-	27 999	-	-
3.4.2.3	Implementing sustainable waste management strategies and programmes	661 409	-	-	680 842	-	-
3.4.2.4	Strengthening capabilities for the disposal of radioactive waste	846 159	-	51 500	808 222	-	21 500
3.4.2.5	Management of disused sealed radioactive sources	629 506	-	-	603 909	-	-
	Subprogramme 3.4.2 - Management and Disposal of all Types of Radioactive Waste	**3 044 618**	**428 695**	**51 500**	**3 000 622**	**428 695**	**21 500**
3.4.3.1	Controlling the exposure of humans and non-human species from ionizing radiation	533 564	-	-	533 538	-	-
3.4.3.2	Achieving international agreement on modelling environmental radionuclide transfer and doses to humans and non-human species	274 854	-	-	274 834	-	-
3.4.3.3	Minimizing and processing radioactive effluents	38 255	-	-	47 489	-	-
	Subprogramme 3.4.3 - Assessment and Control of Radioactive Discharges to the Environment	**846 673**	**-**	**-**	**855 861**	**-**	**-**
3.4.4.1	Developing and implementing guidance on the safe termination of nuclear activities	373 440	725 000	-	373 321	725 000	-
3.4.4.2	Regulating and remediating environments with radioactive residues including residues from naturally occurring radioactive material (NORM)	396 374	30 000	-	396 568	45 000	-
3.4.4.3	Facilitating the transfer of sustainable technologies for decommissioning of facilities	328 687	-	-	377 286	-	-
3.4.4.4	Promoting technologies for remediation of contaminated sites	201 308	-	-	196 280	-	-
	Subprogramme 3.4.4 - Decommissioning of Installations and Remediation of Sites	**1 299 809**	**755 000**	**-**	**1 343 455**	**770 000**	**-**
Programme 3.4 - Management of Radioactive Waste		**6 327 422**	**1 313 869**	**51 500**	**6 327 751**	**1 328 869**	**101 500**

Major Programme 3 - Nuclear Safety and Security

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 16

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary a_/	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary a_/	2009 CAURBs Unfunded
3.5.1.1	Assessing nuclear security needs, priorities and threats	63 461	1 166 108	-	63 461	1 166 108	-
3.5.1.2	Coordinated nuclear security activities with Member States	269 014	1 032 165	-	269 013	1 032 165	-
3.5.1.3	Providing consistency and coherence of nuclear security activities and programmes	101 146	201 728	-	101 146	201 728	-
	Subprogramme 3.5.1 - Assessing Nuclear Security Needs, Threat Analysis and Coordination	**433 621**	**2 400 001**	**-**	**433 620**	**2 400 001**	**-**
3.5.2.1	Developing guidelines and recommendations for the prevention of malicious acts	173 702	1 369 712	-	173 702	1 369 712	-
3.5.2.2	Supporting implementation of the nuclear security framework to prevent malicious acts	107 385	4 328 394	-	107 385	4 328 394	-
3.5.2.3	Providing nuclear security services for prevention of malicious acts	171 859	951 896	-	171 859	951 896	-
	Subprogramme 3.5.2 - Preventing Malicious Activities Involving Nuclear and Radioactive Materials and their Associated Facilities	**452 946**	**6 650 002**	**-**	**452 946**	**6 650 002**	**-**
3.5.3.1	Developing guidelines and recommendations for detection and response to malicious acts	130 778	978 306	-	130 778	978 306	-
3.5.3.2	Providing nuclear security services for detection and response to malicious acts	45 018	1 165 455	-	45 018	1 165 455	-
3.5.3.3	Supporting implementation of the nuclear security framework for detection and response to malicious acts	45 018	4 306 278	-	45 018	4 306 278	-
	Subprogramme 3.5.3 - Detecting and Responding to Malicious Activities involving Nuclear and other Radioactive Material	**220 814**	**6 450 039**	**-**	**220 814**	**6 450 039**	**-**
Programme 3.5 - Nuclear Security		**1 107 381**	**15 500 042**	**-**	**1 107 380**	**15 500 042**	**-**
Major Programme 3 - Nuclear Safety and Security		**23 515 728**	**26 239 150**	**281 500**	**23 516 674**	**25 422 532**	**231 500**

a_/ Includes funds from the Nuclear Security Fund - see Tables 3A and 3B for details.

Major Programme 3 - Nuclear Safety and Security

Core Activities Unfunded in the Regular Budget
Table 17

	Project Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
3.1.1.1	Enhancing national and regional preparedness for responding to radiation incidents and emergencies		
	3.1.1.1 *On-line monitoring equipment for the IEC*	34 485	28 000
	Subprogramme 3.1.1 - Enhancing Member State Preparedness and Response Capabilities	34 485	28 000
3.1.2.1	Operating and enhancing the Secretariat's incident and emergency system		
	3.1.2.1 *Field monitoring, communication and video conferencing equipment for the IEC*	174 065	95 500
3.1.2.3	Increasing and sustaining awareness of IEC capabilities, services and products - Strengthening IEC Outreach		
	3.1.2.3 *On-line monitoring equipment for the IEC*	21 450	6 500
	Subprogramme 3.1.2 - Enhancing Preparedness and Response Capabilities of International Organizations	195 515	102 000
Programme 3.1 - Incident and Emergency Preparedness and Response		**230 000**	**130 000**
3.4.1.1	Servicing the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and developing waste safety standards		
	3.4.1.1/04 Organize the third Review Meeting of the Joint Convention (interpretation)	-	80 000
	Subprogramme 3.4.1 - Development of an International Safety Regime for the Management of Radioactive Waste	-	80 000
3.4.2.4	Strengthening capabilities for the disposal of radioactive waste		
	3.4.2.4/12 Coordinate a CRP on application of geographical information system (GIS) in repository development (2008-2012)	51 500	21 500
	Subprogramme 3.4.2 - Management and Disposal of all Types of Radioactive Waste	51 500	21 500
Programme 3.4 - Management of Radioactive Waste		**51 500**	**101 500**
Major Programme 3 - Nuclear Safety and Security		**281 500**	**231 500**

Major Programme 4
Nuclear Verification

Introduction

The nuclear verification programme supports the Agency's statutory mandate to establish and administer safeguards, to ensure that special fissionable and other material, services, equipment, facilities and information are not used in such a way as to further any military purpose. For this purpose, the Agency concludes safeguards agreements with States which confer upon the Agency the legal obligation and authority to apply safeguards to nuclear material, facilities and other items subject to safeguards. Under this major programme, the Agency carries out verification, evaluation, development and strategic planning activities required for implementing safeguards.

Verification and evaluation activities enable the Agency to establish a complete and comprehensive information basis upon which safeguards conclusions can be drawn. Development and strategic planning activities permit the Agency to enhance and improve this information basis, to anticipate and prepare for future technological requirements, and to improve the overall effectiveness and efficiency of the safeguards system.

The increasing importance of capabilities to detect undeclared nuclear material and activities has been strongly reflected in all relevant activities in this area. More specifically, throughout the biennium, the Agency will improve and intensify the development and/or acquisition of more effective information collection, analysis and evaluation tools.

In addition, the Agency is supporting the efforts of the international community to verify nuclear arms control and reduction agreements and arrangements.

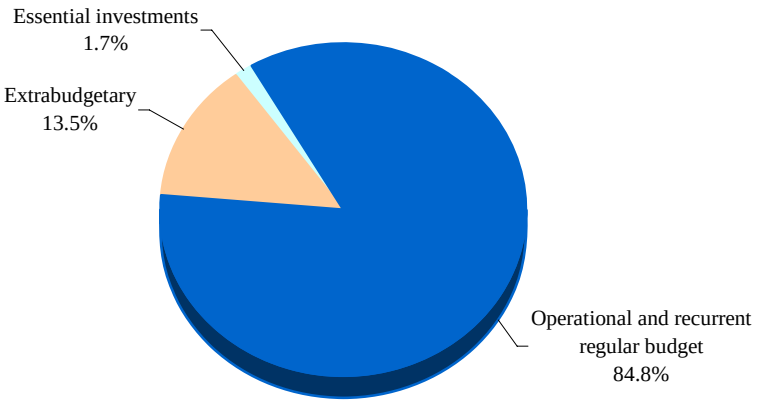
The objectives of the nuclear verification programme are derived from the Medium Term Strategy 2006–2011. In addition, the objectives aim at further enhancing the Agency's capability to draw independent, impartial and timely safeguards conclusions and its ability to adequately respond to current and future proliferation challenges.

The programmatic and financial forecast provided hereunder is based on currently available information regarding States' nuclear infrastructure, nuclear material and activities. The resource impact of new, additional tasks as well as of tasks which are expected to be completed during the upcoming biennium has been assessed and taken into account. The impact of tasks of an uncertain nature and their potential resource requirements have also been assessed to the extent possible.

Objectives	Performance Indicators
— To provide independent, impartial, timely and credible safeguards conclusions, and assurance that States are abiding by their nuclear non-proliferation commitments.	— Number of States for which safeguards conclusions are drawn in accordance with relevant safeguards agreements and additional protocols thereto, as appropriate.
— To contribute, as appropriate, to verifying nuclear arms control and reduction agreements.	— Support provided for verification of weapons origin and other fissile material as requested by Member States.

Outcomes	Performance Indicators
— Safeguards conclusions regarding the absence of undeclared nuclear material and activities.	— Number of States for which safeguards conclusions are drawn regarding: (i) the non-diversion of declared nuclear material; and (ii) the absence of undeclared nuclear material and activities.
— Safeguards conclusions regarding the non-diversion of declared nuclear material, and the non-misuse of facilities and items placed under safeguards.	— Number of States for which safeguards conclusions are drawn regarding the peaceful use of nuclear material and facilities, and other items placed under safeguards.
— More effective verification system.	— Safeguards strengthening measures implemented for all States, including States with small quantities protocols (SQPs).
— Advice and assistance in establishing a verification regime for weapons-origin and other fissile material released from nuclear weapons programmes.	— Verification tools and techniques available as and when requested.

2008–2009 Resources for Nuclear Verification[1]



Programmes	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Overall management, coordination and common activities	1 057 670	1 057 670	2 115 340
Safeguards	112 614 837	114 822 323	227 437 160
Operational and recurrent regular budget	113 672 507	115 879 993	229 552 500
Essential investments	1 315 000	3 294 000	4 609 000
Total regular budget	**114 987 507**	**119 173 993**	**234 161 500**
Extrabudgetary	20 912 339	15 709 939	36 622 278
TC programme	—	—	—
Total resources	**135 899 846**	**134 883 932**	**270 783 778**

4.0.0.1 Overall management, coordination and common activities

Description	Main outputs
A central focal point is required to: provide overall direction; set and coordinate policy; and exercise general management of programme planning, implementation and monitoring.	Strategic planning documents; reporting documents; country specific safeguards information; action and follow-up plans for implementation of management mechanisms and tools.

4.0.0.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	1 057 670	1 057 670
Extrabudgetary	—	—
Unfunded	—	—

[1] Excludes unfunded activities of €6 235 426.

Programme 4.1 Safeguards

4.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	112 614 837	114 822 323
Extrabudgetary	20 912 339	15 709 939
Unfunded	5 191 713	1 043 713

Specific criteria for prioritization:

1. First priority is given to projects which respond directly to the Agency's mandatory obligations. The Agency is legally bound to conduct these projects under any and all circumstances and cannot postpone or defer their implementation due to insufficient resources.
2. Second priority is given to projects which support or enhance the Agency's performance. These projects provide the technological, methodological, information management (IM) and research infrastructure required for effectively and efficiently conducting mandatory activities. Implementing these projects ensures that the obligations defined in the Agency's Statute and safeguards agreements, and arising from decisions of the Board of Governors, are met in the most effective and efficient manner.
3. Third priority is given to non-mandatory projects that are carried out at the request of Member States.

Subprogramme 4.1.1 Operations

Rationale: The Agency implements all verification measures required for the application of safeguards in States in accordance with safeguards agreements and additional protocols (APs) in force. Specifically, verification measures are applied pursuant to: (a) agreements based on INFCIRC/153 (Corrected) related to States' commitments under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), or similar non-proliferation undertakings such as treaties establishing nuclear-weapon free zones; (b) agreements based on INFCIRC/66/Rev.2, which are item specific agreements; (c) voluntary offer agreements (VOAs) concluded with the nuclear-weapon States; and (d) protocols additional to safeguards agreements, concluded on the basis of the Model Additional Protocol (INFCIRC/540 (Corrected)). All projects under this subprogramme are designed to maintain and further enhance the Agency's unique capability to draw independent, impartial and timely safeguards conclusions.

Objectives:

— To ensure the timely availability of all information required for the Agency to draw safeguards conclusions in a comprehensive and consistent manner.

— To increase the efficiency of verification measures applied in accordance with relevant safeguards agreements.

Outcomes	Performance Indicators
— Evaluated information on nuclear material, nuclear activities and other safeguards relevant issues at State level.	— Number of States for which safeguards relevant information was received or collected, verified and analysed.
— Increased effectiveness of verification activities.	— State level approaches (SLAs) and Annual Implementation Plans (AIPs) prepared and implemented in a timely manner.
— Increased efficiency of verification activities in States where integrated safeguards are being implemented.	— Extent to which verification efforts were reduced in States where integrated safeguards are being implemented.

Programmatic changes and trends: Priority will continue to be given to the objectives reflected in the Medium Term Strategy 2006–2011, to further strengthen the Agency's ability to provide assurances that States are complying with their safeguards obligations. To this end, the effectiveness of the safeguards system will need to be increased and the Agency's ability to detect undeclared nuclear material and activities must be enhanced. It is assumed that the new partnership approach in Euratom States will prevail.

Under the revised Small Quantities Protocols (SQP), States will be required to submit initial reports on their nuclear material subject to safeguards, to provide information about any existing or planned facilities and to provide the Agency with inspection rights. While the Agency does not foresee regular verification activities in such States, and therefore does not expect any measurable increase in field effort, some additional evaluation work is initially anticipated.

Environmental sampling has proven to be one of the most effective measures introduced under strengthened safeguards for detecting undeclared nuclear material and activities. The Agency's Safeguards Analytical Laboratory (SAL) in Seibersdorf is essential for the safeguards system for continued nuclear material verification and environmental sampling analysis. The Agency therefore aims at maintaining and enhancing its capabilities in this area, including through: upgrades of the infrastructure of the nuclear material laboratory at SAL; expansion of the capacity and capability to process and analyse environmental samples at SAL; and expansion of the capacity and capability of the Network of Analytical Laboratories (NWAL) through the qualification of additional environmental sampling laboratories as part of NWAL and/or by enhancing the capability of current network laboratories.

As reported in GOV/2007/36 "Monitoring and Verification in the Democratic People's Republic of Korea", at the invitation of the Democratic People's Republic of Korea (DPRK), subsequent to the agreement reached at the Six Party Talks in Beijing in February 2007, the Agency and the DPRK discussed procedural matters related to monitoring and verification arrangements. In the Initial Actions, the parties agreed that the DPRK "will shut down and seal, for the purpose of eventual abandonment, the Yongbyon nuclear facility, including the reprocessing facility, and invite back IAEA personnel to conduct all necessary monitoring and verification as agreed between IAEA and the DPRK".

The Agency may start implementing safeguards at several additional nuclear facilities operating in India's civilian nuclear programme during the biennium 2008–2009. Implementation of safeguards is expected at four on-load reactors by 2010 (two in 2008 and two in 2010). Safeguards will be extended to one fuel fabrication plant in 2008, and may be applied at one reprocessing plant on a "campaign" mode after 2010. The spent fuel of a shutdown research reactor will be placed under safeguards in 2010.

It is possible that safeguards will be implemented at a new commercial enrichment plant in the USA as of 2007. Similarly, safeguards may be implemented at a new enrichment facility in France, which is currently at the planning and development stage for possible start up of operation in 2009.

Upon request from Member States, the Agency assists in the development of a regime for the verification of weapon origin and other fissile materials specified by the Russian Federation and the USA as released from defence programmes. These activities are mainly related to the technical, legal and administrative infrastructure of such a verification regime. By its nature, the support requested from the Agency in this regard is linked to some of the Agency's verification activities in States with VOAs. Taking into account the distinct scope of this task, the Agency's assistance in this regard will now be carried out as a new, separate activity under a project on Verification in States with Voluntary Offer Agreements (4.1.1.4), within the subprogramme Operations. A project was previously dedicated to the Agency's assistance in this regard within the subprogramme Development and Support.

Resource changes and trends: The proposed regular budget resources, in real terms, for Subprogramme 4.1.1 reflects a decrease of 3.3% (€2.4 million) in 2008 compared with 2007 and an increase of 2.6% (€1.8 million) in 2009 over 2008. Extrabudgetary funds of €8.5 million expected to be received in 2008 and €6.7 million in 2009 will be mainly directed to the project on the Provision of Safeguards Instrumentation (4.1.1.8).

The Agency is requesting voluntary contributions to cover the cost of monitoring and verification activities agreed to between the DPRK and the Agency, estimated at €2.2 million in 2008. Assuming that these activities remain at the same level as in 2008, €2.2 million has been included in the regular budget for 2009.

The expected additional verification activities in India will require significant resources, which have not been included in the regular budget. A supplementary appropriation to the regular budget for 2008 is foreseen, as agreed by the Board at its July 2007 meeting, to finance these verification activities should they commence in 2008.

To date, the implementation of integrated safeguards has resulted in savings of around 10% in inspection effort. The extent of savings differs in each State, depending on the size of the nuclear programme, types of facilities, the integrated safeguards options implemented and other State specific factors. For example, in the case of Canada, as of 2008 the number of calendar days in the field in this State is expected to be reduced by a quarter, following the full implementation of integrated safeguards. Savings made so far have been used to finance

increasing activities at Headquarters, related to the introduction of new facilities and State evaluations, and additional measures in the field such as complementary access.

It is expected that integrated safeguards will be gradually implemented in the European Union in the coming years. While integrated safeguards have already been implemented in several States, including application to various components of the nuclear fuel cycle in Japan, it is anticipated that additional savings will be accrued as integrated safeguards are extended to direct use material, including the reprocessing plants in Japan and applied in additional States.

Included within the regular budget of Major Programme 4 are the costs of services provided by areas of the Secretariat responsible for external relations and policy coordination, the policy-making organs and legal services, amounting to €1.15 million in 2008 and €1.15 million in 2009.

Also, €5.8 million in 2008 and €5.9 million in 2009 are included as a contribution to shared costs for Safeguards Analytical Laboratory.

4.1.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	72 312 940	74 161 511
Extrabudgetary	8 455 107	6 670 707
Unfunded	3 926 713	828 713

Projects

Title, duration and priority	Main outputs
4.1.1.1. Verification in States with comprehensive safeguards agreements ***Duration:*** Recurrent ***Priority:*** 1	Statements on the results of inspections, and statements of conclusions; inspection documentation; safeguards approaches and inspection procedures developed and approved; design information verification (DIV) plans prepared and approved; DIVs carried out in accordance with plans; technical, administrative and logistical arrangements, including subsidiary arrangements, for verification; results of pre-AP field trials; verification equipment maintained in operational state.
4.1.1.2. Verification in States with comprehensive safeguards agreements and an additional protocol in force ***Duration:*** Recurrent ***Priority:*** 1	Statements on the results of inspections, statements of conclusions; inspection documentation; safeguards approaches and inspection procedures developed and approved; DIV plans prepared and approved; DIVs carried out in accordance with plans; statements on the results and conclusions on complementary access (CA) activities; technical, administrative and logistical arrangements; modified Subsidiary Arrangements where required; verification equipment installed and maintained.
4.1.1.3. Verification in States with an INFCIRC/66-type agreement ***Duration:*** Recurrent ***Priority:*** 1	Safeguards transfer agreement letters; inspection documentation; safeguards approaches and inspection procedures developed and approved; DIV plans prepared and approved; DIVs carried out in accordance with plans; technical, administrative and logistical arrangements in place in connection with the implementation of INFCIRC/66-type agreements and additional protocol measures (where applicable); verification equipment installed and maintained.
4.1.1.4. Verification in States with voluntary offer agreements ***Duration:*** Recurrent ***Priority:*** 1	Statements on the results of inspections; relevant information analysed; safeguards approaches and inspection procedures developed and approved; DIV plans prepared and approved; and DIVs carried out in accordance with plans; verification equipment installed and maintained.
4.1.1.5. Information processing ***Duration:*** Recurrent ***Priority:*** 1	Up to date, reliable, high quality information in the databases; routine and ad hoc information and analyses; mandatory statements to the Member States (semi-annual statements of book inventories, import communication, transit matching statements); analytical reports in support of the Secretariat's State evaluations.
4.1.1.6. State evaluation ***Duration:*** Recurrent ***Priority:*** 1	Reviewed and evaluated safeguards information; new, updated or reviewed State Evaluation Reports.

Title, duration and priority	Main outputs
4.1.1.7. Effectiveness evaluation ***Duration:*** Recurrent ***Priority:*** 1	Evaluated and assessed inspections and other verification activities; Safeguards Implementation Report (SIR), Safeguards Technical Report (STR), SIR Action Plan.
4.1.1.8. Provision of safeguards instrumentation ***Duration:*** Recurrent ***Priority:*** 1	Equipment prepared, calibrated, installed and tested (where appropriate), such as portable non-destructive assay (NDA) systems, resident NDA systems, sealing and containment verification systems, surveillance systems, unattended monitoring systems (UMS), remote monitoring systems; reports on equipment status, inventory, performance and utilization.
4.1.1.9. Sample logistics and analysis ***Duration:*** Recurrent ***Priority:*** 1	Bulk analyses and particle analyses of environmental samples; analyses of samples of nuclear and other specified materials; environmental sampling kits; re-coded and screened environmental samples; inspection samples shipped; contracts maintained with NWAL; qualification of analytical laboratories for NWAL; quality controlled laboratories within NWAL; adequate SAL infrastructure.

Subprogramme 4.1.2 Development and Support

Rationale: The Agency ensures the availability of an efficient, effective and state of the art technological, methodological, information and communication infrastructure in support of the Agency's verification regime. This includes the development, acquisition, improvement, enhancement or availability (as appropriate) of: verification equipment and instrumentation; analytical techniques and methodologies; safeguards concepts and approaches; information and communication technology (ICT) capabilities; and capabilities for collection, analysis and evaluation of safeguards-relevant information provided by States, derived from Agency verification activities, or acquired from open and other sources. Implementation of the Agency's safeguards mandate also requires sound management and control of financial and human resources, including the timely availability of skilled and knowledgeable staff.

Objectives:

— To improve and enhance the Agency's technological, conceptual, methodological and analytical capabilities required for the implementation of safeguards.
— To improve and enhance the information and knowledge base required for the implementation of safeguards.
— To ensure adequate and uniform legal authority to implement safeguards verification activities in an impartial manner.

Outcomes	Performance Indicators
— Availability of the most adequate technological capabilities in support of verification.	— Extent to which verification equipment, techniques and instruments are developed and made available as and when required, according to the needs identified.
— Availability of the most appropriate analysis and evaluation capabilities in support of verification.	— Extent to which information acquisition, analysis and evaluation capabilities are available as and when required.
— Availability of the most appropriate conceptual and methodological capabilities in support of verification.	— Extent to which safeguards approaches, concepts (in particular for State level integrated safeguards) and policies are available as and when required.
— Increased number of comprehensive safeguards agreements (CSAs) and APs.	— Number of States in which comprehensive safeguards agreement and APs thereto are implemented.

Programmatic changes and trends: A number of programmatic activities are expected to intensify in 2008–2009 and, consequently, to impact on the allocation of human and financial resources. The Agency will improve its detection capabilities regarding undeclared nuclear material and activities through the introduction of new and/or improved verification equipment, techniques and methods. In addition, it will seek to increase the reliability of equipment while ensuring the security of information transmitted from the field and improving sustainability and timeliness. The foreseen enhancement of technical detection capabilities also requires a more

active role by the Agency in R&D undertakings directed at the acquisition of more effective, reliable and tamper secure verification equipment. A project is being dedicated to the development of Novel Safeguards Verification and Detection Techniques (4.1.2.15).

The Agency will reinforce its efforts to have adequate and uniform legal authority in place to ensure the availability of and access to safeguards relevant information in all States, and thus to enhance the credibility of safeguards conclusions. Consequently, it will intensify its promotional activities aimed at having protocols additional to safeguards agreements in force in all States, and at having CSAs in force in all NPT non-nuclear-weapon States. The Agency will also intensify its assistance to States to enhance the competence of personnel tasked with the implementation of State's obligations under CSAs and APs.

As already stated, a project previously dedicated to the Agency's assistance in the development of a regime for the verification of weapon origin and other fissile materials specified by the Russian Federation and the USA as released from defence programmes has been integrated into Project 4.1.1.4.

Resource changes and trends: The proposed regular budget resources, in real terms, for Subprogramme 4.1.2 reflects an increase of 6.6% (€2.4 million) in 2008 compared with 2007 and a minor increase in 2009 over 2008. The net increase of €2.4 million in 2008 corresponds to a decrease by the same amount in Subprogramme 4.1.1 Operations, and therefore a new project on Novel Safeguards Verification and Detection Techniques (4.1.2.15) and a dedicated project on the Analysis of Trade in Nuclear Technology and Materials (4.1.2.16) have been incorporated into the programme within existing budget levels.

Extrabudgetary funds expected to be received amount to €12.5 million in 2008 and €9 million in 2009, which represents a significant increase compared with 2007.

The development and implementation of a safeguards approach for a large mixed oxide fuel fabrication plant in Japan (JMOX) (4.1.2.9) is expected to require significant resources. The construction of the plant will commence in 2007 and operations are expected to start in 2011–2012.

The establishment of secure physical premises at Headquarters is required in order to ensure the physical reliability and confidentiality of equipment containing safeguards sensitive information. This project will be initiated in 2007 and completed in the 2008–2009 biennium.

Extrabudgetary resource needs for the development and/or improvement of safeguards instrumentation (4.1.2.1) have increased (€3.7 million in 2008 and €581 000 in 2009).

With regard to the project on Information Support for Strengthened Safeguards (4.1.2.12), regular budget resource needs will increase by €475 000 in 2008 and by an additional €165 000 in 2009 due to the necessary enhancement of both the Agency's information analysis architecture and the capabilities to analyse safeguards relevant information from open and other sources. Extrabudgetary funds required for the implementation of this project amount to €1.2 million in 2008 and €1.1 million in 2009.

As the project on the IAEA Safeguards Information System (ISIS) Re-engineering (4.1.2.13) progresses, regular budget resource needs are expected to decrease by €2.6 million in 2008 and 2009, respectively. Extrabudgetary contributions to this project are expected to amount to €3.9 million in 2008 and €3.8 million in 2009.

Regarding the Agency's work on the Chernobyl conditioning facility, the project (4.1.2.10) is expected to recommence development and installation work after infrastructure design modifications. It is expected that the facility will be commissioned at the end of 2009 at the earliest. The increase in resource needs is expected to be accommodated by extrabudgetary funds (€675 000 in 2008 and €1 million in 2009). In addition, unfunded activities of an unpredictable nature related to that project correspond to €1 million in 2008 and €150 000 in 2009.

4.1.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	40 301 897	40 660 812
Extrabudgetary	12 457 232	9 039 232
Unfunded	1 265 000	215 000

Projects

Title, duration and priority	Main outputs
4.1.2.1. Development of safeguards instrumentation ***Duration:*** Recurrent ***Priority:*** 2	New or upgraded portable and resident NDA systems, seals and containment verification equipment, surveillance systems, unattended monitoring systems, and remote monitoring systems; and corresponding procedures and documentation.
4.1.2.2. IT application support ***Duration:*** Recurrent ***Priority:*** 2	Strategic development plan; enhanced system software engineering procedures; IT solutions for: planning, implementation and documentation of verification activities, including for on-site inspections; handling State supplied data; analysis and evaluation of safeguards information; and support systems.
4.1.2.3. ICT systems support ***Duration:*** Recurrent ***Priority:*** 2	Communications technology infrastructure at Headquarters and in the field; communication and storage infrastructure capacity for remote monitoring; software and hardware tools for security of safeguards data and information systems; and reliable safeguards information systems, physical and IT control systems.
4.1.2.4. System studies and approaches ***Duration:*** Recurrent ***Priority:*** 2	State level integrated safeguards concepts and approaches; improved guidelines for additional protocol implementation; papers for the Policy-making Organs and Advisory Groups (SAGSI, ASTOR); policy papers on particular safeguards issues; new model safeguards approaches, (e.g. for the Pebble Bed Modular Reactor (PBMR) and for geological repositories); improved safeguards approaches (e.g. for facilities undergoing decommissioning); strategic plan for improving the effectiveness and efficiency of safeguards; cost–benefit analyses; technical guidelines for State evaluation; physical model updating and revision; analyses and policy concerning the implementation of safeguards concepts and methods; and a proliferation resistance assessment methodology.
4.1.2.5. Process design, analysis and improvement ***Duration:*** Recurrent ***Priority:*** 2	New and/or improved processes, process descriptions, procedures and guidelines for safeguards implementation; measurements of process performance against performance standards; internal quality audit reports detailing non-conformities and opportunities for improvement; and corrective action and preventive action programmes.
4.1.2.6. Statistical analysis ***Duration:*** Recurrent ***Priority:*** 1	Environmental sampling techniques; statistical methods for safeguards verification data; special evaluation reports on Shipper/Receiver Difference (SRD), material unaccounted for (MUF) and D statistics (difference between value declared by operators and those measured by the inspectors), trend analyses of MUF and other material balance components and the effectiveness of results; reports on analyses of quantitative safeguards verification measurements; reports on effects of conducting inspections at random under integrated safeguards; and specific requests related to environmental sampling.
4.1.2.7. Safeguards training ***Duration:*** Recurrent ***Priority:*** 1	A number (40–50) of basic, advanced and refresher training courses; training curriculum; and training procedures to formalize routines for needs analysis, training design, development, implementation and assessment.
4.1.2.8. Programme and resource management and administration of Member State support programmes ***Duration:*** Recurrent ***Priority:*** 2	Programme evaluation document for 2006–2007; mid-term progress evaluation for 2006–2007; human and financial resources management; programme and budget for 2010–2011; biennial report on the research and development programme for 2006–2007; application reports on Member State Support Programme tasks; and research and development programme for 2010–2011.

Title, duration and priority	Main outputs
4.1.2.9. Development and implementation of a safeguards approach for a large mixed oxide fuel fabrication plant in Japan - JMOX ***Duration:*** 2007–2012 ***Priority:*** 1	Project plan and schedule; safeguards approach document, facility attachment; design information and verification file; integrated, unattended measurement systems in facility; user requirements and procurement orders; documentation for authorization of measurement systems for inspection use; acceptance test procedures, and reports on test results.
4.1.2.10. Development and implementation of safeguards approaches for Chernobyl NPP ***Duration:*** 2004–2019 ***Priority:*** 1	Safeguards approach for nuclear material in former Reactor Unit 4 ('Shelter') and safeguards approach for transfer of irradiated fuel from wet storage and Reactor Units 1 to 3 to dry storage; safeguards equipment requirements established; safeguards equipment procured, assembled, installed, calibrated and tested.
4.1.2.11. Negotiation and promotion of comprehensive safeguards agreements, additional protocols and subsidiary arrangements ***Duration:*** Recurrent ***Priority:*** 1	Comprehensive safeguards agreements, APs, subsidiary arrangements; conferences, workshops and seminars to promote CSAs and APs.
4.1.2.12. Information support for strengthened safeguards ***Duration:*** Recurrent ***Priority:*** 2	Safeguards open source information system; collected, adequately stored, assessed and properly distributed safeguards relevant information; capability to analyse commercial satellite imagery; evaluated applicability of new remote sensing systems and satellites through field trials and other studies.
4.1.2.13. IAEA Safeguards Information System (ISIS) re-engineering ***Duration:*** 2003–2009 ***Priority:*** 2	Core safeguards software system replaced.
4.1.2.14. State Systems of Accounting for and Control of nuclear material (SSACs) ***Duration:*** Recurrent ***Priority:*** 2	Up to date guidelines for the establishment, improvement and maintenance of effective SSACs at State and facility level; SSAC advisory mission reports issued to recipient States; provision of equipment and/or experts for implementing SSAC at State and facility level; training of SSAC personnel; and updated/upgraded curricula and course materials.
4.1.2.15: Novel safeguards verification and detection techniques ***Duration:*** Recurrent ***Priority:*** 2	R&D development plan and task reports for novel methods, techniques and instruments; equipment prototypes and operation manuals; evaluation and field test reports.
4.1.2.16: Analysis of trade in nuclear technology and material ***Duration:*** Recurrent ***Priority:*** 2	Analyses of procurement networks involved in covert trade in sensitive nuclear technology and material; analyses of related proliferation risks; complementary information for State evaluations.

Major Programme 4 - Nuclear Verification

Summary of Programme Structure and Resources
(excluding Essential Investments)
Table 18

	Project / Subprogramme / Programme	2008 Regular Budget at 2008 prices	2008 Extra-budgetary	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary	2009 CAURBs Unfunded
4.0.0.1	Overall management, coordination and common activities	1 057 670	-	-	1 057 670	-	-
		1 057 670	**-**	**-**	**1 057 670**	**-**	**-**
4.1.1.1	Verification in States with comprehensive safeguards agreements	1 468 874	-	2 282 000	3 692 690	-	-
4.1.1.2	Verification in States with comprehensive safeguards agreements and an additional protocol in force	40 965 008	544 500	-	40 197 382	466 500	-
4.1.1.3	Verification in States with an INFCIRC/66-type agreement	2 427 903	-	-	2 371 317	-	-
4.1.1.4	Verification in States with voluntary offer agreements	1 100 453	638 518	1 044 713	1 227 835	620 118	828 713
4.1.1.5	Information processing	1 991 706	5 000	-	1 990 544	5 000	-
4.1.1.6	State evaluation	3 924 716	-	-	3 949 275	-	-
4.1.1.7	Effectiveness evaluation	1 599 118	-	-	1 715 589	-	-
4.1.1.8	Provision of safeguards instrumentation	11 270 544	7 267 089	-	11 352 971	4 749 089	-
4.1.1.9	Sample logistics and analysis	7 564 618	-	600 000	7 663 908	830 000	-
	Subprogramme 4.1.1 - Operations	**72 312 940**	**8 455 107**	**3 926 713**	**74 161 511**	**6 670 707**	**828 713**
4.1.2.1	Development of safeguards instrumentation	3 005 910	3 651 189	200 000	3 396 437	581 189	-
4.1.2.2	IT application support	4 453 529	271 511	-	4 414 101	271 511	-
4.1.2.3	ICT systems support	7 121 883	912 221	-	7 316 606	692 221	-
4.1.2.4	System studies and approaches	2 479 875	342 536	-	2 545 300	342 536	-
4.1.2.5	Process design, analysis and improvement	1 778 330	111 707	-	1 744 758	111 707	-
4.1.2.6	Statistical analysis	2 470 576	-	-	2 476 110	-	-
4.1.2.7	Safeguards training	2 022 438	137 484	65 000	1 729 235	137 484	65 000
4.1.2.8	Programme and resource management and administration of Member State support programmes	1 525 139	200 000	-	1 538 290	-	-
4.1.2.9	Development and implementation of a safeguards approach for a large mixed oxide fuel fabrication plant in Japan - JMOX	4 420 779	589 535	-	3 734 574	589 535	-
4.1.2.10	Development and implementation of safeguards approaches for Chernobyl NPP	168 352	675 000	1 000 000	512 399	1 025 000	150 000
4.1.2.11	Negotiation and promotion of comprehensive safeguards agreements, additional protocols and subsidiary arrangements	1 626 013	-	-	1 605 888	-	-
4.1.2.12	Information support for strengthened safeguards	4 645 308	1 227 391	-	4 813 033	1 127 391	-
4.1.2.13	IAEA Safeguards Information System (ISIS) re-engineering	2 457 892	3 938 658	-	2 421 414	3 760 658	-
4.1.2.14	State Systems of Accounting for and Control of nuclear material (SSACs)	796 216	400 000	-	873 861	400 000	-
4.1.2.15	Novel safeguards verification and detection techniques	461 519	-	-	605 621	-	-
4.1.2.16	Analysis of trade in nuclear technology and material	868 138	-	-	933 185	-	-
	Subprogramme 4.1.2 - Development and Support	**40 301 897**	**12 457 232**	**1 265 000**	**40 660 812**	**9 039 232**	**215 000**
Programme 4.1 - Safeguards		**112 614 837**	**20 912 339**	**5 191 713**	**114 822 323**	**15 709 939**	**1 043 713**
Major Programme 4 - Nuclear Verification		**113 672 507**	**20 912 339**	**5 191 713**	**115 879 993**	**15 709 939**	**1 043 713**

Major Programme 4 - Nuclear Verification

Core Activities Unfunded in the Regular Budget
Table 19

	Project Title and Description of Activities		2008 CAURBs Unfunded	2009 CAURBs Unfunded
4.1.1.1	Verification in States with comprehensive safeguards agreements			
	4.1.1.1	*Verification activities related to the DPRK nuclear programme*	2 282 000	-
4.1.1.4	Verification in States with voluntary offer agreements			
	4.1.1.4/02	*Carry out safeguards activities in France*	589 000	451 000
	4.1.1.4/04	*Carry out safeguards activities in United Kingdom*	32 000	-
	4.1.1.4/05	*Carry out safeguards activities in the United States of America*	252 400	206 400
	4.1.1.4/06	*Assist Member States in nuclear disarmament efforts upon request*	171 313	171 313
4.1.1.9	Sample logistics and analysis			
	4.1.1.9/03	*Analyse nuclear and source material samples*	600 000	-
	Subprogramme 4.1.1 - Operations		3 926 713	828 713
4.1.2.1	Development of safeguards instrumentation			
	4.1.2.1	*Contracts for development of safeguards instrumentation*	200 000	-
4.1.2.7	Safeguards training			
	4.1.2.7	*E-learning activities*	65 000	65 000
4.1.2.10	Development and implementation of safeguards approaches for Chernobyl NPP			
	4.1.2.10/01	*Install and test safeguards equipment to verify transfer of irradiated fuel from wet storage and reactor units 1 to 3 to dry storage via the conditioning facility*	1 000 000	150 000
	Subprogramme 4.1.2 - Development and Support		1 265 000	215 000
Programme 4.1 - Safeguards			**5 191 713**	**1 043 713**
Major Programme 4 - Nuclear Verification			**5 191 713**	**1 043 713**

Major Programme 5
Policy, Management and Administration

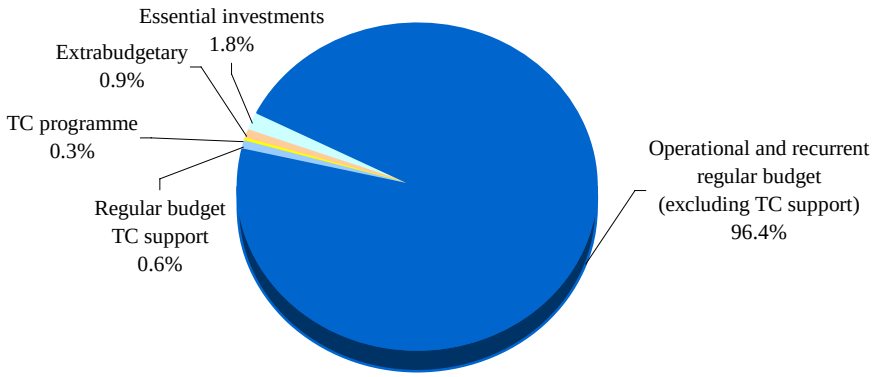
Introduction

The Agency's programme, under the active leadership, direction and authority of the Director General and through its Medium Term Strategy, seeks to achieve the goals and objectives of its Member States. As part of this effort, effective coordination is essential for instituting a one house approach in all aspects of its work, particularly with respect to: overall policies; interactions with Member States; the development and implementation of programmes; the evaluation and assessment of performance; and the management and interchange of information, within the Secretariat, between the Secretariat and Member States, and for the benefit of the media and the general public. In addition, a wide range of effective and efficient administrative and legal services will continue to be provided to support activities in all Agency programmes.

Objectives	Performance Indicators
— To fully institute the one house and results based approach that will ensure relevance, transparency, effectiveness and efficacy of all Agency programmes, activities and use of resources.	— Absence of duplication, overlap and conflicts in programme management.
— To increase understanding of the work of the Agency and its Member States, and to ensure timely access to relevant scientific and technical information.	— Degree of satisfaction and understanding concerning Agency programmes, activities and use of resources.

Outcomes	Performance Indicators
— Formulation, implementation, assessment and evaluation of the Agency's Programme in a fully coordinated manner.	— Absence of duplication and overlap in the Agency's Programme.
— Timely, transparent and appropriate administrative and legal services provided to the scientific and technical programmes of the Agency.	— Degree of satisfaction regarding the efficiency of administrative and legal services.
— Efficient and effective information support services and communications strategies.	— Ease of access to Agency information by the Secretariat, Member States, the media and the general public.

2008–2009 Resources for Policy, Management and Administration[1]



Functions	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Executive Leadership and Policy	12 081 153	12 081 010	24 162 163
Legal Services	2 318 559	2 318 551	4 637 110
Oversight Services	1 677 992	1 677 991	3 355 983
Public Information and Communications	3 422 558	3 429 879	6 852 437
Information and Communication Technology	8 973 243	8 973 695	17 946 938
Financial Management and Services	7 043 900	7 043 896	14 087 796
Human Resources Management	6 086 609	6 086 538	12 173 147
General Services	27 571 092	27 563 975	55 135 067
Conference, Languages and Publishing Services	5 294 169	5 294 067	10 588 236
Operational and recurrent regular budget	74 469 275	74 469 602	148 938 877
Essential investments	1 314 000	1 464 000	2 778 000
Total regular budget	**75 783 275**	**75 933 602**	**151 716 877**
Extrabudgetary	701 335	701 335	1 402 670
TC programme	202 800	213 500	416 300
Total resources	**76 687 410**	**76 848 437**	**153 535 847**

[1] Excludes unfunded activities of €27 972 468.

5.0.1 Executive Leadership and Policy

Rationale: In order to be responsive to the needs, interests and requirements of Member States, the Agency needs a central point of authority that provides for overall direction, the setting and coordination of policy, and the general management of programme planning and implementation.

Objective: To provide leadership and coordination of policy for all Agency activities at the executive level for achieving Member State needs, the one house culture, and the results based management approach.

Outcome	Performance Indicator
— Effective, efficient and transparent execution of Agency programmes and activities relevant to Member States.	— Satisfaction of Member States with the efficiency, effectiveness and transparency of the programme delivered.

Programmatic changes and trends: Interaction with governments, senior management of international organizations and civil society will continue to be strengthened and the scope of such interaction broadened. The one house concept and results based management approach to programme formulation will be improved in light of the experience and lessons learned from the previous biennia.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. Part of the cost for servicing special meetings of the Board of Governors remains unfunded.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: The greater use of document management systems is intended to facilitate the timely issuance of documents to Member States.

5.0.1	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	12 081 153	12 081 010
Extrabudgetary	—	—
Unfunded	258 200	258 200

Subfunctions

Title	Main outputs
5.0.1.1 Executive leadership	Provision of direction and issuance of policy guidance and instructions to support the implementation of the Agency's mandate; statements delivered at important meetings and events, particularly meetings of the Policy-making Organs.
5.0.1.2 Policy-making organs	Meetings of Policy-making Organs; documents for meetings of the Policy-making Organs; briefing sessions for Member States on the Agency's programme.
5.0.1.3 Policy coordination and external relations	Regular correspondence, meetings and contacts with Member States and coordination with inter-governmental and non-governmental organizations on all areas of Agency activities; coordinate policies in all areas of Agency activities and in all documentation for the Board of Governors and General Conference.
5.0.1.4 Planning, coordination and management services	Management decisions and guidance; recommendations of the Programme Coordination Committee (PCC), of the High Level Committee on Management (HLCM) and of the Committee on Common Services (CCS); planning documents for consultations with Member States; guidelines and training material for results based management; advice and guidance for the management and coordination of cross-cutting areas; draft Medium Term Strategy 2012–2016; recommendations to improve management techniques and practices, organizational design and management tools; SEC/DIRs on administrative procedures and updating of the Administrative Manual; INF/NOTs for the general information of staff.

5.0.2 Legal Services

Rationale: Legal advice is needed on the implementation of all aspects of the Agency's programme and is provided to the Director General, to the Secretariat and to the organs and bodies of the Agency and, on request, to Member States. The advice provided covers general legal matters, safeguards and non-proliferation, as well as on all matters of nuclear and treaty law.

Objective: To achieve higher quality in programme implementation following timely and appropriate legal advice.	
Outcome	**Performance Indicator**
— Highest standard of legal advice provided to the Director General, the Secretariat and to the organs and bodies of the Agency, and on request to Member States.	— Appropriateness and timeliness of the legal support provided to all clients.

Programmatic changes and trends: The increase for general legal support and substantial work in connection with strengthened safeguards and other verification activities, for protection against nuclear terrorism and technical cooperation is expected to continue. This is also true for the demand from Member States for assistance in the preparation of national legislation, in particular relating to the implementation of international agreements to which they are a party. In addition, the areas of personnel and management continue to require an increasing amount of legal advice.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are at the same level as the 2007 budget.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: Each subfunction now fully integrates the activities described in the Programme and Budget.

5.0.2	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	2 318 559	2 318 551
Extrabudgetary	—	—
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.2.1 General legal affairs	Legal advice and support to the Secretariat in all aspects of its operation, including personnel, financial matters, contracts, and privileges and immunities to ensure that the Agency's activities are conducted in accordance with the Statute and other regulatory instruments and in a transparent and accountable manner.
5.0.2.2 Legal services for non-proliferation and policy-making organs	Legal advice and support to the Policy-making Organs of the Agency, in particular in connection with the Rules of Procedure of the General Conference, the Board of Governors, and subordinate committees, and other bodies established by the Policy-making Organs; legal support and advice in respect of the Agency's verification activities, as well as the drafting, negotiation, conclusion, interpretation and implementation of safeguards agreements; legal support and advice in connection with the drafting, negotiation and conclusion of Project and Supply Agreements.
5.0.2.3 Legal services for nuclear and treaty law	Legal advice and support to the Secretariat with respect to the Agency's activities under the pillars of safety and technology; responses to legal questions from Member States relating to the work of the Agency and to States' obligations under relevant international agreements for which the Director General is depository; national legislative frameworks governing the safe and peaceful uses of nuclear energy in Member States enhanced through the provision of advice on, or drafting of, legislation; individual training and regional training courses.

5.0.3 Oversight services

Rationale: Oversight services provide independent and objective assurances to the Director General and senior management that: the operational and programmatic activities of the Agency are carried out in compliance with established regulations, rules and policies; risks are managed adequately; the internal controls are adequate and efficient; and allocated resources are managed economically, effectively and efficiently to achieve the defined outcomes and objectives of the Agency. Other oversight services include administrative fact-finding and investigations in the event that the Agency's regulations, rules and pertinent administrative instructions may have been violated, or where irregularities have come to light.

Objective: Improved internal controls, accountability, risk management practices, compliance with rules, regulations and policies, and assurance of economic, efficient and effective use of resources.

Outcome	Performance Indicator
— Recommendations emanating from audits, evaluations, reviews and follow-ups accepted and implemented by management.	— Percentage of recommendations implemented from audits, evaluations, reviews and follow-ups.

Programmatic changes and trends: The greater focus on oversight functions in most organizations and UN agencies, coupled with the Agency's increasing dependency on IT systems and secure ICT environments in delivering its programmes, mean that the Agency's oversight activities will continue to be strengthened.

Resource changes and trends: The 2008–2009 regular budget resource requirements for all oversight services, including management services, in real terms, are at the same level as the 2007 budget.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: The main lesson learned in the 2004–2005 biennium was the need for a better system for tracking and reporting oversight recommendations, which was expected to lead to a more effective achievement of the results of the programme managers. A database has been developed for all recommendations and a web-based access is being planned to allow managers to review the status of the implementation of recommendations. Thematic evaluations related to the technical cooperation (TC) programme will be complemented by evaluations of the regular programme. Both types of evaluation will continue to be reported separately to the Technical Assistance and Cooperation Committee (TACC) and the Programme and Budget Committee (PBC), respectively, minimizing overlap. Until the timing of reporting for the TC programme evaluations is changed, TC programme evaluations will be conducted as early as possible in the year of the TACC report in order to achieve the same level of completeness in evaluation reports to the two committees.

5.0.3	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	1 677 992	1 677 991
Extrabudgetary	—	—
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.3.1 Internal audit	Approximately 30 audit reports.
5.0.3.2 Investigation	Investigation reports based upon concerns reported or detected.
5.0.3.3 Programme evaluation	Evaluation reports on the following thematic areas: sustainable intensification of crop production systems; management of radiation sources; activities on research reactors; support to countries considering embarking on a nuclear power programme; State evaluation processes; implementation of integrated safeguards; Agency staff development and training; and publications. Evaluation reports relating to the TC programme in areas as approved by the Board of Governors.

5.0.4 Public information and communications

Rationale: Accurate and objective information is necessary for sound and informed policy debate on the safe, secure and peaceful uses of nuclear technologies. The Agency has a unique responsibility to disseminate such information, particularly in the light of enhanced media and public interest following the award of the 2005 Nobel Peace Prize. In addition to the exchange of information between the Secretariat, media and the general public, the Agency engages in proactive communications with the media, opinion leaders and policy-makers on issues of particular importance and concern to its Member States.

Objective: To bring about more accurate, balanced and objective understanding of nuclear issues and the role of the Agency.	
Outcome	**Performance Indicators**
— Improved knowledge on the part of the media and general public of the core objectives of the Agency.	— Number of media reports and articles referring to the Agency's activity in nuclear technology, safety, security and non-proliferation. — Number of visits to the iaea.org web site.

Programmatic changes and trends: Greater use is being made of educational and modular 'information packages' in order to better inform the public on the diversity of the Agency's activities, as well as on its contributions to global development goals. In addition, many of these information packages are being published in electronic (web based) and printed formats to maximize their impact and reach.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. Savings from a reduction in the number of contracts have been used to meet increased demands generated by the very high media profile of the Agency. To further enhance the visibility of the Agency, the photo and video content of its web site will be increased. Its ability to communicate effectively in the event of nuclear crises will also be strengthened. Printed materials will focus on issues with a wider public appeal, while reducing overly technical publications.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: The main lesson learned is that since external events are difficult to predict, considerable flexibility is necessary in the Agency's planning for resources and its response capability. In this context, a renewed focus on enhancing the Agency's web site, making use of the most recent technological developments, is intended to deal with the expected increased need of policy makers and the general public for timely, up to date and transparent information. In addition, the availability of expert press officers to effectively project the viewpoint of the Agency will be a key part of this focus.

5.0.4	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	3 422 558	3 429 879
Extrabudgetary	309 840	309 840
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.4.1 Internet and print communications	The corporate web site (iaea.org); topical brochures, fact sheets, magazine (IAEA Bulletin); and multimedia products, including digital images and video.
5.0.4.2 Press and public outreach	Media interviews; lectures to media and visiting groups; radio/TV packages; press releases; daily review of the newspapers and journals (Daily Press Review); training for 'nuclear communicators' in Member States.

5.0.5 Information and Communication Technology

Rationale: Information and communication technology (ICT) services provide the means by which many of the outputs of Agency programmes are efficiently and transparently produced and delivered to their intended recipients. The continuing development and evolution of the technologies, of the requirements of Agency programmes, and of the needs of Member States make it important that the introduction of innovative ICT services follows a clear strategy. This has been derived from the Agency's Information Management/Information Technology (IM/IT) Medium Term Strategy 2007–2011, which is itself aligned with the Agency's overall Medium Term Strategy 2006–2011. The Agency's ICT services can be divided into standard services provided to all users, both at the workplace and as infrastructure, and innovative solutions developed to support programme planning and delivery.

Objective: To meet, in the most efficient and effective way, the ICT needs of Agency programmes and Member States.	
Outcomes	**Performance Indicators**
— ICT services optimized to meet Agency programmatic requirements and those of the Member States.	— Number of Service Level Agreements (SLA) with major customers. — Number of services that are benchmarked and measured against best practice targets of availability, response and resolution time.
— Major ICT investments coordinated throughout the Agency.	— Reviews and clearance mechanisms for major ICT investments.
— Improved effectiveness, efficiency, transparency and ease of use of the programme management support processes and systems.	— Level of effectiveness, efficiency and ease of use of the programme management support processes and systems. — Transparency of allocation of Agency resources to Member States.

Programmatic changes and trends: The Agency's ICT services will need to adapt not only to changes in the technology and in the requirements of Agency programmes, but also to industry trends and best practices towards centralization of the information used to plan and manage the resources of an organization to reduce costs and eliminate duplication.

In 2008–2009, implementation will begin, subject to funding, of the Agency-wide information system for programme support, to establish a more effective, transparent and integrated support system covering: finance, procurement, human resources, programme and project management, meetings, contacts, transportation and travel.

The Agency plans the construction of a secure and reliable technical area to serve as the Agency's computer centre. To avoid duplication of effort, it will support the IT infrastructure for the entire Agency while meeting the security standards necessary for confidential safeguards information.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. With the demand for ICT services continuing to grow, efficiency gains are being used to keep up with demand, and the Agency is continuing to expand the portion of services delivered through outsourcing agreements. Additionally, projects are planned to increase the automation and improve the processes that manage the delivery of IT services, by expanding the adoption of industry trends and best practices such as the Information Technology Infrastructure Library (ITIL). Recent success with offshore software development has resulted in more projects planned under this model.

The total cost for an Agency-wide information system for programme support is estimated at €24 million based on an extensive feasibility study and the calculations of external consultants. For 2008–2009, the costs are estimated at €15.8 million. Priority is given to upgrading the financial and procurement systems, including the system support needed for the introduction of IPSAS, and to the human resource and programme and project management domains. The project is unfunded.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: A recommendation to hold annual IT security audits has been taken into account. A feasibility study by an external management consulting firm included a review of the processes and systems in support areas and an evaluation to determine

to what extent the Agency would benefit from adopting an Enterprise Resource Planning software (ERP). The results were conveyed to the Board of Governors in GOV/INF/2007/5 *Integrated Agency-wide Information System for Programme Support*. The need for a Business Continuity Plan for ICT services and for the Agency as a whole has also been taken into account.

5.0.5	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	8 973 243	8 973 695
Extrabudgetary	—	—
Unfunded	10 245 834	9 360 234

Subfunctions

Title	Main outputs
5.0.5.1 ICT end-user services	Supply of ICT end-user services at the required level (including incident and problem solving, user registration for the network and email, advice on purchasing equipment, and other services supplied directly to the end-user); maintenance of desktop and laptop standards; training of Agency staff in the use of standard tools.
5.0.5.2 ICT infrastructure services	Provision of secure infrastructure and networks at a high level of availability and performance, meeting the requirements and needs of Agency programmes and Member States.
5.0.5.3 ICT solutions	Agency-wide information system integrating the organizational processes and systems that support programme management, planned and executed according to the stipulated milestones; implementation of information systems supporting Agency programmes, such as the Agency-wide information system for programme support, OASIS and Nucleus; implementation of other programme specific information systems; support to facilitate access to the Agency's management and administrative information through OASIS, and the Agency's nuclear knowledge and information resources through Nucleus.

5.0.6 Financial Management and Services

Rationale: Sound management of financial resources is essential for the full implementation of the Agency's programme and to ensure the continued confidence and support of Member States. This involves the effective and efficient provision, based on the Agency's Financial Regulations and Rules, of financial services in programme budgeting, payments, payroll, financial accounting and reporting, with the goal of supporting the Secretariat in carrying out its mandated functions.

Objective: To ensure the continued confidence of the Board of Governors and Member States in the financial management of the Agency, and deliver relevant services efficiently and effectively in support of all Agency programmes.

Outcome	Performance Indicator
— Sound and timely financial planning, budgeting, accurate and reliable financial reporting and efficient financial administration of the Agency.	— Timeliness and extent of use of budgetary and financial documents and reports.

Programmatic changes and trends: A new automated Programme and Budget Information System (PROBIS) was introduced in 2006 to facilitate and streamline the preparation of 2008–2009 budget proposals. Further enhancements to PROBIS, such as budget implementation and reporting, are planned for in 2008–2009.

Activities related to the implementation of IPSAS will be carried out. It is anticipated that major overhaul or upgrading of Agency's financial systems will take place in 2008–2009.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are at the same level as the 2007 budget. The Agency's continuous efforts to rationalize resource allocation, and simplify and automate business processes will bring about efficiency gains. Specifically, reorganization of functional units, simplifying procedures for the acceptance of voluntary contributions, and incorporation of budget

formulation processes into the programme and budget information system are expected to result in efficiency gains. The resultant savings will be deployed to partly meet the requirements for IPSAS.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: There is a need to continue to improve the management of extrabudgetary resources, integrate support systems and streamline business procedures.

5.0.6	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	7 043 900	7 043 896
Extrabudgetary	200 000	200 000
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.6.1 Budgeting, accounting, monitoring and reporting	The Agency's Programme and Budget 2010–2011; Agency's Accounts; reports to governing bodies and donors.
5.0.6.2 Payment processing and treasury	Payments for staff, vendors, contractors, trainees, etc.
5.0.6.3 Financial policy coordination and systems support	Compliance with IPSAS of Agency financial statements; improved internal control and transparency with respect to assets and liabilities; alignment of the Agency's accounting with best accounting practices; more comprehensive information about costs to better support results based management; amendment to Financial Regulations and Rules; updated accounting policies and guidelines in compliance with IPSAS; ongoing systems support and technical solutions to user requests; staff trained.

5.0.7 Human Resources Management

Rationale: Human resources services encompass a wide variety of activities ranging from planning, recruitment, staff development and career management to compensation and benefits, as well as medical and health related services. Managing these activities effectively requires aligning the human resources capacity to the Agency's core goals and is therefore critical to the quality, efficiency and success of its programmes.

Objective: To enable the Agency to effectively and efficiently deliver its programmes by acquiring and managing human resources with the required competencies and fostering, within the framework of the UN Common System, a satisfactory work environment.

Outcomes	Performance Indicators
— Alignment of human resources with the Agency's programme.	— Number of existing and new job descriptions/vacancy notices issued according to the new competency based format. — Number of managers trained in the use of competency based tools.
— Improved staff relations and conditions of service (including the work environment).	— Positive staff feedback on employment and working conditions acknowledged through exit interviews, surveys or other means.

Programmatic changes and trends: Based on results achieved with respect to the modernization of the UN Pay and Benefits System and other UN reform initiatives, the Agency will, as deemed appropriate and in line with other Common System organizations, proceed with the implementation of these initiatives. This will entail the revision/enhancement of the recruitment, performance review, compensation, staff development and other systems. In this context, the use of competency based tools, management and staff development/training will be key to supporting and furthering the implementation of UN reforms since there will be an impact on job design, recruitment, staff mobility, as well as other aspects of human resources management.

The Secretariat will have to re-engineer and/or enhance its human resources processes and tools, as well as integrate the Personnel Information Management system (PerMis) with its other management systems.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are at the same level as the 2007 budget. Efficiency gains will be achieved by: streamlining and automating human resources processes; improved reporting tools, including a strategic overview of human resources for results based human resources management; and better performance management.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: Organizational objectives will be achieved through: the development of planning tools; the identification of competencies; an improved alignment of human resources; a better understanding of in-house staffing needs; and strengthening internal partnerships. Further emphasis will be placed on gender balance and equitable geographical distribution. Increased contacts with Member States, and greater public relations and outreach efforts will contribute to more effective human resources management. Efforts will be made to improve employee health through the maintenance of high quality medical services, and through targeted health promotion and immunization campaigns.

5.0.7	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	6 086 609	6 086 538
Extrabudgetary	—	—
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.7.1 HR advisory and operational services	Strategic human resources plans; effective organizational structures and generic job design; human resources management reports; competency based recruitment, and systems for performance, career management and training; information and reports on employment conditions; improved handling of grievances; enhanced management capacity; new and revised policies; simplified procedures; streamlined/re-engineered practices and systems; user-friendly integrated computerized applications and on-line systems.
5.0.7.2 Medical services	Medical services for staff of the VIC based organizations, including implementation of the United Nations Common System Medical Standards; advice to management on the handling of emergencies/special circumstances warranting preventive care and/or remedying action (epidemics, serious health matters, etc.); and advice on medical standards for recruitment, placement, disability, and entry to the Pension Fund.

5.0.8 General Services

Rationale: General administrative, procurement and logistical services are essential to enable programme managers and staff to perform their functions and implement programmatic activities. These services range from procuring goods and services, facilities management and engineering services for Headquarters and the laboratories, archives and records management, property management, travel and transportation, import and export facilitation, and insurance matters, together with the management of the VIC Commissary.

Objective: To enable the Agency to perform its function by providing an efficient and effective general administrative and support services infrastructure.

Outcomes	Performance Indicators
— General services delivered to the Agency in a cost efficient manner.	— Satisfaction of staff members and Member States with the quality of customer service provided.
— High level of maintenance, security and safety on the VIC premises.	— Positive feedback from staff on physical working conditions.

Outcomes	Performance Indicators
— Complete, accurate and cost effective preservation of the Agency's records for as long as they are required and efficient services in providing access to them.	— Conditions for storage of archives, with speed in responding to queries for records.
— Provision of cost effective, transparent and efficient procurement and contracting services.	— Customer satisfaction, optimum volume and value of goods and services procured versus costs incurred.

Programmatic changes and trends: The Agency's share of VIC operations and services provided outside the Vienna duty station, has been separated from other functions to enable better control and monitoring of the large planned investments in the next two biennia. Continued emphasis will be placed on the automation and simplification of work processes in order to achieve efficiencies and guarantee a more streamlined and controlled environment. Incoming and outgoing official correspondence will be stored in the Agency's electronic document management system, with full records management business rules applied to maintain a reliable and accessible evidence base for communication. A significant increase in requests for videoconferencing services is expected, which will yield the benefit of reducing travel costs.

Advantage will be taken of the VIC asbestos removal project, which will continue into the 2008–2009 biennium and beyond, to undertake urgent renovations of the VIC's infrastructure and facilities.

The revised organizational structure and functions of the Secretariat's centralized procurement services is expected to lead to a clearer delineation of roles with the aim of facilitating better control and enhanced accountability. There will also be a greater focus on the strategic aspects of procurement in order to establish long term agreements to cope with the increasing volume and value of requests and to improve the services provided to customers.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are consistent with the 2007 budget. A decline in the circulation of paper copies is anticipated since the electronic routing of official correspondence will expedite delivery; official emails with attachments and the distribution of multiple electronic copies will decrease, and ultimately reduce email storage requirements.

Part of the funds required for the new conference centre and the electronic refurbishment of building C in the context of the asbestos removal project are listed as essential investments. Other facilities-related projects remain unfunded.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: Recommendations by internal and external audits, as well as by management studies, have been implemented to: improve human resource action plans in the archives and records management areas; enhance customer services in areas such as housing, travel and transportation, insurance and visa and customs formalities; facilitate better management and financial control of the Agency's share of costs relating to the common services; improve customer service, enhance accountability and control in procurement activity.

5.0.8	**2008** *at 2008 prices*	**2009** *at 2008 prices*
Regular Budget	27 571 092	27 563 975
Extrabudgetary	124 941	124 941
Unfunded	4 050 000	3 800 000

Subfunctions

Title	Main outputs
5.0.8.1 Travel and transportation services	Travel related arrangements, including air tickets, visa issuance and hotel reservations; vehicles for local transport; arrangements for shipment of staff household effects, freight, chemicals and nuclear material; facilitation of the import of goods; refunds for taxes; web based housing services to meet the accommodation needs of staff.

Title	Main outputs
5.0.8.2 Facilities management	Allocation and adaptation of space for offices, meeting rooms and storage facilities; alterations and refurbishment work; technical support for servicing Board of Governors and other policy-making meetings and technical meetings, including videoconferencing; management of Agency property; technical advice and project coordination for Agency offices and laboratories outside Vienna; facilities management software system to accommodate customer requests and property accountability.
5.0.8.3 Archives and records management	Updated policies and procedures; records registration, filing, distribution, transfer and disposal; mail processing, dispatch and distribution; services for information retrieval and messaging.
5.0.8.4 VIC shared services	Buildings management and safety and security services for staff, mission staff, meeting participants and visitors.
5.0.8.5 Procurement services	Procurement plans developed and implemented; goods and services for implementing Agency's programmatic activities procured and delivered on a timely basis.

5.0.9 Conference, Languages and Publishing Services

Rationale: One of the main functions assigned to the Agency by its Statute is the dissemination of scientific and technical information. This core function may be carried out by organizing meetings and conferences, preparing and issuing documents for the policy-making bodies, and by preparing and distributing publications. The Agency needs a centralized operation that implements these activities for its users and clients, both internal and external, to achieve efficiency, avoid duplication, provide consistency and guarantee quality.

Objective: To enable the effective exchange and dissemination of information relevant to the Agency's work and mandate between the Secretariat and Member States by organizing meetings and conferences, issuing documents in the six official UN languages, and preparing and distributing publications.

Outcome	Performance Indicators
— Efficient and effective management and coordination of conference, translation and publishing services.	— Productivity for all three main activities: conference, translation and publishing services. — Customer satisfaction as measured through feedback received.

Programmatic changes and trends: The ever-increasing application of IT technologies in tasks related to conference, translation and publishing services is seen as a key factor in the future. Some functions, such as the coordination of the more than 16 000 services demanded annually in these areas, can be automated to a large degree. This trend will continue in 2008–2009. In addition, more reliance on outsourcing, with the aim of saving financial resources, is foreseen. The new conference centre, which will become available in early 2009 and which will be equipped with the latest technology, will permit the more efficient organization and management of meetings. The re-engineering of organization structures and workflows, which will be completed by January 2008, is expected to simplify administrative procedures and further automate workflows.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, are at the same level as the 2007 budget.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: The recommendations of various reviews and evaluations have been implemented and managed in a systematic manner, employing project management tools. More attention will be devoted to risk management and quality control. In addition, more systematic and comprehensive quality control procedures will be put into place to deal with the anticipated increase in use of outsourcing.

5.0.9	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	5 294 169	5 294 067
Extrabudgetary	66 554	66 554
Unfunded	—	—

Subfunctions

Title	Main outputs
5.0.9.1 Conference services	Organizational support to all Agency meetings; facilities and premises provided for all Agency meetings; monthly meetings schedule; improved Agency-wide Meeting System; copies of meeting documents.
5.0.9.2 Language services	Approximately 25 000 pages of translated documents and summary records in the six official languages; terminology database made available via the Internet to selected external users from Member States and other international organizations, as well as to external translators.
5.0.9.3 Publication services	Approximately 200 publications (i.e. printed books, booklets, pamphlets, CD-ROMs and other electronic titles) edited, laid out and published every year; publication of the Agency's Annual Report and the monthly academic journal Nuclear Fusion; semi-annual and annual sales catalogues, subject specific brochures and individual book promotion flyers; over 100 million pages printed per year, using up to date and flexible 'print-on-demand' technology.

Major Programme 5 - Policy, Management and Administration

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 20

	Subfunctions / Functions	2008 Regular Budget at 2008 prices	2008 Extra-budgetary	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary	2009 CAURBs Unfunded
5.0.1.1	Executive leadership	1 410 490	-	-	1 410 488	-	-
5.0.1.2	Policy-making Organs	6 534 940	-	258 200	6 534 800	-	258 200
5.0.1.3	Policy coordination and external relations	2 224 136	-	-	2 224 136	-	-
5.0.1.4	Planning, coordination and management services	1 911 587	-	-	1 911 586	-	-
	Function 5.0.1 - Executive Leadership and Policy	**12 081 153**	**-**	**258 200**	**12 081 010**	**-**	**258 200**
5.0.2.1	General legal affairs	862 187	-	-	862 186	-	-
5.0.2.2	Legal services for non-proliferation and policy-making organs	300 264	-	-	300 263	-	-
5.0.2.3	Legal services for nuclear and treaty law	1 156 108	-	-	1 156 102	-	-
	Function 5.0.2 - Legal Services	**2 318 559**	**-**	**-**	**2 318 551**	**-**	**-**
5.0.3.1	Internal audit	780 810	-	-	780 810	-	-
5.0.3.2	Investigation	226 667	-	-	226 667	-	-
5.0.3.3	Programme evaluation	670 515	-	-	670 514	-	-
	Function 5.0.3 - Oversight services	**1 677 992**	**-**	**-**	**1 677 991**	**-**	**-**
5.0.4.1	Internet and print communications	1 659 079	-	-	1 666 400	-	-
5.0.4.2	Press and public outreach	1 763 479	309 840	-	1 763 479	309 840	-
	Function 5.0.4 - Public information and communications	**3 422 558**	**309 840**	**-**	**3 429 879**	**309 840**	**-**
5.0.5.1	ICT end-user services	1 778 356	-	50 000	1 778 356	-	50 000
5.0.5.2	ICT infrastructure services	3 964 965	-	1 700 000	3 965 186	-	1 700 000
5.0.5.3	ICT solutions	3 229 922	-	8 495 834	3 230 153	-	7 610 234
	Function 5.0.5 - Information and Communication Technology	**8 973 243**	**-**	**10 245 834**	**8 973 695**	**-**	**9 360 234**
5.0.6.1	Budgeting, accounting, monitoring and reporting	3 147 149	-	-	3 147 147	-	-
5.0.6.2	Payment processing and treasury	2 800 395	-	-	2 800 395	-	-
5.0.6.3	Financial policy coordination and systems support	1 096 356	200 000	-	1 096 354	200 000	-
	Function 5.0.6 - Financial Management and Services	**7 043 900**	**200 000**	**-**	**7 043 896**	**200 000**	**-**
5.0.7.1	HR advisory and operational services	6 086 609	-	-	6 086 538	-	-
5.0.7.2	Medical services	-	-	-	-	-	-
	Function 5.0.7 - Human Resources Management	**6 086 609**	**-**	**-**	**6 086 538**	**-**	**-**
5.0.8.1	Travel and transportation services	2 291 023	-	-	2 291 024	-	-
5.0.8.2	Facilities management	2 228 978	-	3 900 000	2 228 978	-	3 800 000
5.0.8.3	Archives and records management	3 434 903	-	-	3 434 901	-	-
5.0.8.4	VIC shared services	17 563 642	-	150 000	17 563 642	-	-
5.0.8.5	Procurement services	2 052 546	124 941	-	2 045 430	124 941	-
	Function 5.0.8 - General Services	**27 571 092**	**124 941**	**4 050 000**	**27 563 975**	**124 941**	**3 800 000**
5.0.9.1	Conference services	1 075 722	66 554	-	1 061 574	66 554	-
5.0.9.2	Language services	1 462 940	-	-	1 466 512	-	-
5.0.9.3	Publication services	2 755 507	-	-	2 765 981	-	-
	Function 5.0.9 - Conference, Languages and Publishing Services	**5 294 169**	**66 554**	**-**	**5 294 067**	**66 554**	**-**
	Major Programme 5 - Policy, Management and Administration	**74 469 275**	**701 335**	**14 554 034**	**74 469 602**	**701 335**	**13 418 434**

Major Programme 5 - Policy, Management and Administration

Core Activities Unfunded in the Regular Budget
Table 21

	Subfunction Title and Description of Activities	2008 CAURBs Unfunded	2009 CAURBs Unfunded
5.0.1.2	Policy-making Organs		
5.0.1.2/01	*Service meetings for the Board of Governors and General Conference*	258 200	258 200
	Function 5.0.1 - Executive Leadership and Policy	258 200	258 200
5.0.5.1	ICT end-user services		
5.0.5.1/03	*Provide IT training for end-users*	50 000	50 000
5.0.5.2	ICT infrastructure services		
5.0.5.2/02	*Develop and maintain secure access to IT infrastructure services*	500 000	500 000
5.0.5.2/04	*Financing of the Equipment Replacement Fund 2009 (ERF-2009)*	1 200 000	1 200 000
5.0.5.3	ICT solutions		
5.0.5.3/04	*Implement Agency-wide information system for programme support - establishing a more effective, transparent and integrated programme support system*	8 355 144	7 469 544
5.0.5.3	*Agency IT information security officer*	140 690	140 690
	Function 5.0.5 - Information and Communication Technology	10 245 834	9 360 234
5.0.8.2	Facilities management		
5.0.8.2/01	*Facilities renovation works in conjunction with the asbestos removal project*	750 000	750 000
5.0.8.2/02	*Plan and coordinate technical and engineering services at the VIC*	100 000	-
5.0.8.2/03	*Plan and implement actions on all technical engineering and infrastructure development concerning Agency field offices and laboratories*	2 700 000	2 700 000
5.0.8.2/05	*Rationalize office space through the continuation of the space efficiency programme and works on the facilities management system*	250 000	250 000
5.0.8.2/06	*Provide technical advice in the decision making process on all technical/engineering matters concerning the Agency*	100 000	100 000
5.0.8.4	VIC shared services		
5.0.8.4/03	*C building electronics equipment*	150 000	-
	Function 5.0.8 - General Services	4 050 000	3 800 000
Major Programme 5 - Policy, Management and Administration		**14 554 034**	**13 418 434**

Major Programme 6
Management of Technical Cooperation for Development

Introduction

The Secretariat through this major programme works closely with Member States to formulate the technical cooperation (TC) programme, based upon the needs, interests and priorities of Member States, and provides strategic direction for integrating planning and priority setting processes that bring greater synergy between the Agency's technical cooperation and regular programmes.

The objective for Major Programme 6 has been updated to reflect the vision statement for the Agency in 2011, which foresees the Agency playing a leading role in anticipating, promoting and facilitating the peaceful uses of nuclear energy for sustainable development, and thus responding effectively and efficiently to the expressed needs of its Member States with a focus on areas where nuclear technology offers competitive solutions and advantages. It recognizes that the TC programme is a cross-cutting Agency mechanism supporting Member State programmes through the adoption and implementation of the results based management approach. Major Programme 6 is therefore formulated to establish direct linkage with and accountability for achievement of the goals and objectives contained in the Agency's Medium Term Strategy (MTS) 2006–2011.

Major Programme 6 encompasses programme development and implementation of national, regional and inter-regional projects funded from the Technical Cooperation Fund (TCF) and extrabudgetary contributions. Effective and efficient TC programming requires regular and sustained interaction between the Secretariat and Member State representatives and their national institutions to cooperate on agreed objectives through activities in support of national/regional programmes. It requires quality standards and management actions involving all stakeholders, various analytical processes and methods producing informed decisions about project choices, identification and fostering of participation of partners necessary to overcome institutional constraints, mobilization of resources needed to produce project results, monitoring progress toward expected results and reporting on it to Member States and other partners. Guided by the Agency's MTS and objectives contained in the TC Strategy (GOV/INF/2002/8/Mod.1), this management system can be described as the TC framework.

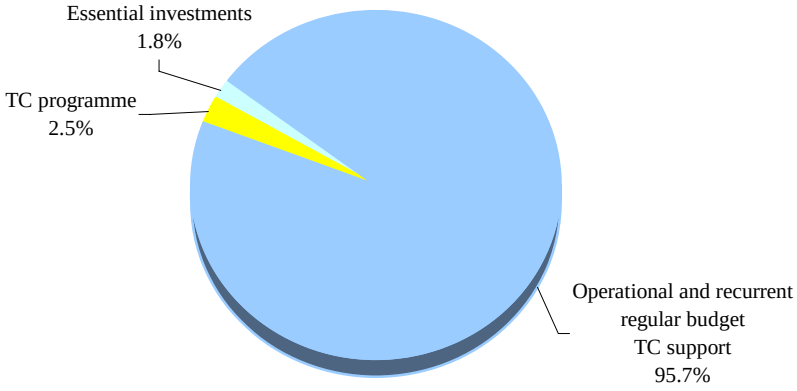
During 2004–2005, the Secretariat initiated a number of process and organizational improvements designed to fortify the regional knowledge base and strengthen the working relationship with Member States and other partners. One outcome of these improvements is that Regional Directors now directly engage Member States in programme development efforts in their regions. Another change is a more effective working relationship through the new Programme Cycle Management Framework (PCMF). The PCMF is based on an interactive approach that stresses Member State prioritization and ownership of projects, while relying on current best practices, a user-friendly, web-based platform and the principle of teamwork. This new organizational and operational structure allows the Secretariat to support the process and collaborate in a transparent manner, while enabling each Member State to take greater responsibility for the formulation and implementation of its programme.

Objective	Performance Indicators
— To establish the leading role of the Agency's TC programme in the application of nuclear technology for sustainable development and social and economic benefits in Member States.	— The Agency's TC programme contributing to strategic targets; — Extent of support and recognition for the TC programme and its role in development.

Outcomes	Performance Indicators
— Effective leadership for coordination, direction and performance of the TC programme.	— Level of satisfaction expressed by governing bodies; — TC programme priorities reflected in the Agency's regular programme; — Timely decision making by senior management.
— Enhanced participation of Member States as strategic partners in the TC programme.	— Strengthened role of National Liaison Officers; — Strengthened regional planning.
— Achievement of the objectives of the TC Strategy.	— Level of achievement of objectives set out in the TC Strategy.

Outcomes	Performance Indicators
— TC programme efficiently and effectively managed according to relevant quality management standards.	— Timeliness of implementation of the TC programme according to work plans; — Quality standards established and applied.

2008–2009 Resources for Management of Technical Cooperation for Development



Function	2008 *at 2008 prices*	2009 *at 2008 prices*	Total for biennium
Management of the technical cooperation programme	16 241 201	16 241 201	32 482 402
Operational and recurrent regular budget	16 241 201	16 241 201	32 482 402
Essential investments	312 000	312 000	624 000
Total regular budget	**16 553 201**	**16 553 201**	**33 106 402**
Extrabudgetary	—	—	—
TC programme	420 800	438 700	859 500
Total resources	**16 974 001**	**16 991 901**	**33 965 902**

6.0.1 Management of the technical cooperation programme

Programmatic changes and trends: Technical cooperation must reflect and adjust to changing needs, interests and priorities in Member States and the evolving relationships between Member States and the Agency. Achievement of the new Major Programme 6 objective will require a more modern programmatic approach supported by an interactive IT environment, and by team building to strengthen experience and internal coordination. At the country and regional levels, detailed knowledge of Member State technical and managerial capacities will be required, as will improved cooperation and technical exchanges between Member States (particularly Technical Cooperation among Developing Countries (TCDC) and South–South cooperation), enhanced project ownership and greater emphasis on knowledge management.

During the coming biennia, the Secretariat intends in Major Programme 6 management to make greater use of national implementation of project activities, which will not only strengthen ownership of the TC process but also alter traditional workflows and workload by the gradual delegation of management roles and responsibilities to national institutions willing and able to assume leadership for programme management tasks. These outcomes are expected to enhance Member State commitment and capacity to effectively participate in the Agency's programmes and missions. A further challenge is the need to ensure greater collaboration and synergy between the Agency's TC programme and the programmes of other UN organizations. The outcomes of these efforts are expected to position the TC programme as a global reference in the application of nuclear technologies for sustainable development.

Resource changes and trends: The 2008–2009 regular budget resource requirements, in real terms, for Major Programme 6 are consistent with the 2007 budget. A continuously expanding TC programme with increased quality requirements and a growing number of Member States poses challenges for the management of the programme, particularly with regard to human resources. Since 2003, the size of the TC programme has increased from $105 million to $144 million and the number of Member States from 137 to 143. TC programme management officers managed an average programme size of $2.6 million in 2003 per officer, while the average programme size in 2006 was $3.4 million. The resulting increase in workload was partially met through efficiency gains realized by streamlining and standardizing workflows and by making greater use of IT, such as the PCMF platform and enhancing the functionality of TC PRIME with the introduction of a module supporting the training course process. The integration of programming and implementation functions in the same sections through organizational restructuring in late 2005 has strengthened the focus on achieving project results and contributed to a more effective distribution of the workload. Applying the competency based framework to job descriptions, and aligning the functions to be carried out with the results set out in Major Programme 6 and the TC Strategy, enabled more effective management of human resources.

With no additional resources in the operational and recurrent portion of the regular budget, Major Programme 6 will continue to search for efficiency gains so as to respond effectively to various General Conference resolutions, including those on strengthening of the Agency's TC activities (GC(50)/RES/12). Efforts will continue to minimize the impact of the ensuing constraints in the following areas: delivery levels in the TC programme; quality of the TC programme; number of projects formulated for the TC programme 2009–2011; implementation and development of new initiatives such as PCMF, communication strategy and mapping and utilization of Member State capacities; and workload of staff.

An essential investment of €312 000 is required in 2008 and €312 000 in 2009 to support the interactive IT environment of this major programme, as described previously in this document. An amount of €50 000 in 2008 and €50 000 in 2009 will be used from the operational and recurrent portion of the regular budget to fund part of the final module of the PCMF.

Follow-up on function specific lessons learned from reviews, assessment, evaluations: A major influence on the formulation of Major Programme 6 has been the recommendations and observations made by the Agency's External Auditors, the Office of Internal Oversight Services (OIOS) and the Standing Advisory Group on Technical Assistance and Cooperation (SAGTAC). In particular, for the forthcoming biennium, the Secretariat will focus on sustaining TC project outcomes by planning and identifying the steps and resources necessary for project counterparts to expand and sustain the benefits of technical cooperation, as recommended by the External Auditor. Implementing the Country Programme Framework (CPF) process as a strategic and cross-cutting mechanism is a recommendation of both OIOS and SAGTAC intended to better integrate Agency planning processes and enhance mutual understanding of Member State priorities, interests and needs and their influence on Agency programmes. This recommendation has been put into practice with the new CPF guidelines.

6.0.1	2008 *at 2008 prices*	2009 *at 2008 prices*
Regular Budget	16 241 201	16 241 201
Extrabudgetary	—	—
Unfunded	—	—

Subfunctions

Title	Main outputs
6.0.1.1 Management of the TC programme for Africa	Signed/updated CPFs; project work plans; completed and assessed projects; regional programme profiles. Programmes for 35 Member States, along with the regional programme for Africa, *with a focus on support to Member States in developing technical, managerial and institutional capacities in nuclear science and technology and promoting the sustainable application of nuclear techniques in such areas of basic human needs to achieve increased food security, improved nutrition and health services, better management of groundwater resources, improved energy development planning, quality control in industrial development and a cleaner and safer environment.*
6.0.1.2 Management of the TC programme for Asia and the Pacific	Signed/updated CPFs; project work plans; completed and assessed projects; regional programme profiles. Programmes for 26 Member States, along with the regional programme for Asia and the Pacific, *with a focus on the strengthening of existing regional resource centres and provision of assistance in comprehensive nuclear power planning, infrastructure strengthening and integrated management of nuclear power plants, with emphasis on safety and security.*
6.0.1.3 Management of the TC programme for Europe	Signed/updated CPFs; project work plans; completed and assessed projects; regional programme profiles. Programmes for 32 Member States, along with the regional programme for Europe, *with a focus on maintaining safety standards in older nuclear power plants and mitigating environmental degradation as well as optimizing the use and sharing of resources and capacities within the region.*
6.0.1.4 Management of the TC programme for Latin America	Signed/updated CPFs; project work plans; completed and assessed projects; regional programme profiles. Programmes for 22 Member States, along with the regional programme for Latin America, *with a focus on strengthening strategic planning capabilities and partnerships at the regional and national levels to facilitate the optimal utilization of existing institutional capacities in nuclear technology in the fields of human health, food and agriculture, environmental protection, water resource management, energy planning and radiological and nuclear safety.*
6.0.1.5 Coordination, support and strategic direction to the TC programme	Guidelines, policy papers, reports and strategic documents; TC training workshops; resources mobilized and new partnerships established; IT applications put in place; quality standards established and monitored.

Major Programme 6 - Management of Technical Cooperation for Development

Summary of Programme Structure and Resources

(excluding Essential Investments)

Table 22

	Subfunctions / Functions	2008 Regular Budget at 2008 prices	2008 Extra-budgetary	2008 CAURBs Unfunded	2009 Regular Budget at 2008 prices	2009 Extra-budgetary	2009 CAURBs Unfunded
6.0.1.1	Management of the TC programme for Africa	3 204 448	-	-	3 204 448	-	-
6.0.1.2	Management of the TC programme for Asia and the Pacific	3 226 529	-	-	3 226 529	-	-
6.0.1.3	Management of the TC programme for Europe	3 177 424	-	-	3 177 424	-	-
6.0.1.4	Management of the TC programme for Latin America	2 397 471	-	-	2 397 471	-	-
6.0.1.5	Coordination, support and strategic direction to the TC programme	4 235 329	-	-	4 235 329	-	-
	Function 6.0.1 - Management of the technical cooperation programme	**16 241 201**	**-**	**-**	**16 241 201**	**-**	**-**
Major Programme 6 - Management of Technical Cooperation for Development		**16 241 201**	**-**	**-**	**16 241 201**	**-**	**-**