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COVER NOTE

from:	Mr Vítor CALDEIRA, President of the European Court of Auditors
date of receipt:	10 February 2012
to:	Mr Nicolai WAMMEN, President of the Council of the European Union
Subject:	Special report No 16/2011: EU Financial assistance for the decommissioning of nuclear plants in Bulgaria, Lithuania and Slovakia: Achievements and Future Challenges

Sir,

I enclose a copy of special report No 16/2011 "EU Financial assistance for the decommissioning of nuclear plants in Bulgaria, Lithuania and Slovakia: Achievements and Future Challenges" together with the Commission's replies.

The special report, which is shortly to be published, was adopted by the Court at its meeting on 26 October 2011 and is accompanied by the replies from the Commission, which was notified of the preliminary findings on 22 July 2011.

(Complimentary close).

(s.) Vítor CALDEIRA

Encl.: Special report No 16/2011: EU Financial assistance for the decommissioning of nuclear plants in Bulgaria, Lithuania and Slovakia: Achievements and Future Challenges.¹

¹ In English only. The other languages of this report are available on the European Court of Auditor's website: <http://eca.europa.eu/>.

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Special Report No 16/2011

(pursuant to Article 287(4), second subparagraph, TFEU)

EU Financial assistance for the **decommissioning of nuclear plants** in
Bulgaria, Lithuania and Slovakia:
Achievements and Future Challenges

together with Commission's replies

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Reply of the Commission

GLOSSARY

Critical path	<p>Common practice applied to project management includes the preparation of detailed project schedules identifying all tasks required to achieve the project objectives within the established timetable and the interrelations among these identified tasks.</p> <p>Within these schedules, the critical path covers those tasks whose implementation could influence the overall project timetable for implementation.</p>
Decommissioning plan	<p>The decommissioning plan is the key document supporting the entire decommissioning process. It contains the information describing the decommissioning concept proposed by the nuclear power plant. It is usually prepared before the facility permanently ceases operation and it requires approval by the regulatory body.</p>
Materials resulting from the decommissioning process	<p>Different materials result from the decommissioning of a nuclear power plant. The following broad categories can be distinguished:</p> <p><u>Non-contaminated materials with commercial value</u></p> <p>This category usually includes specific technological equipment and fuel or raw materials such as iron or steel.</p> <p><u>Conventional waste</u></p> <p>Subject to the verification of the absence of radioactive contamination, they are disposed of through the usual waste treatment plants and facilities.</p> <p><u>Radioactive waste</u></p> <p>This category covers all materials affected by radioactive contamination. They are further subdivided according to the level of radioactivity (very low, low, intermediate or high) and their state (liquid, solid or gaseous). Each waste category needs to be disposed through specific radioactive waste flows.</p> <p><u>Nuclear Fuel</u></p> <p>Whether fresh (unused) or spent (used), nuclear fuel accumulates most of the radioactivity of any nuclear power plant. Fuel needs reprocessing at specialised</p>

	plants.
Nuclear Power Plant	Power plants using fissionable nuclear materials as fuel.
Non-upgradeable nuclear reactors covered by the audited programmes	<p>Following a study conducted by the Commission in 1993 (COM(93) 635 final), two specific reactor types were considered insufficiently safe and non-upgradable: the RBMK and the VVER 440/230 nuclear reactors:</p> <ul style="list-style-type: none"> – ‘RBMK’ stands for <i>Reaktor Bolschoi Moschnosti Kanalnij</i> or High Power Channel Type Reactor. This is the type of reactor that experienced a nuclear accident at Chernobyl NPP. – ‘VVER’ stands for <i>Vodo-Vodyanoi Energetichesky Reaktor</i> or Water-Water Energetic Reactor.
Polluter pays principle	<p>The ‘polluter pays principle’ originates from the 1992 United Nations Conference on Environment and Development, which established that: <i>“National Authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment”</i>.</p> <p>This principle is part of the EU legal framework (see Article 191(2) of the Treaty on the Functioning of the European Union).</p>
Radioactive waste management facilities and technologies	Radioactive waste management facilities and technologies are equipment, engineering skills and installations required for the retrieval, conditioning, processing, transportation, storage and (whenever possible) disposal of radioactive waste.
Stress test	Targeted reassessment of the safety margins of nuclear power plants operating in the EU in case of extreme events challenging the plant safety functions and leading to a severe accident.

EXECUTIVE SUMMARY

- I. In the frame of their EU accession negotiations and in view of increasing nuclear safety, Bulgaria, Lithuania and Slovakia committed themselves to the early closure and subsequent decommissioning of eight non-upgradeable nuclear reactors. Recognizing the exceptional social, economic and financial burden of their commitments, the European Union decided to provide a financial contribution to these three countries.
- II. The main objective of the Court's audit was to assess the effectiveness of the EU funded programmes (1999-2010) in contributing towards the decommissioning of the nuclear reactors and addressing the consequences of their early closure.
- III. The Court concluded that:
 - (a) As a result of a relatively loose policy framework, the programmes do not benefit from a comprehensive needs assessment, prioritization, the setting of specific objectives and results to be achieved. Responsibilities are diffused, in particular with regard to monitoring and the achievement of programme objectives as a whole. The Commission's supervision focuses on the budgetary execution and project implementation.
 - (b) There is no comprehensive assessment concerning the progress of the decommissioning and mitigation process. Delays and cost overruns were noted for key infrastructure projects.
 - (c) Although the reactors were shut-down between 2002 and 2009, the programmes have not yet triggered the required organisational changes to allow the operators to turn into effective decommissioning organisations.
 - (d) Currently available financial resources (including an EU contribution until 2013 worth 2,85 billion euro) will be insufficient and the funding shortfall is significant (around 2,5 billion euro).

IV. The Court recommends that :

- (a) The Commission should put in place the conditions for an effective, efficient and economical use of EU funds. It should establish a detailed needs assessment showing the progress of the programmes so far, the activities still to be performed and an overall financing plan identifying the funding sources. Before further spending takes place, the Commission should analyse the resources available and the expected benefits. This should lead in turn to objectives being aligned with the budget made available and to the establishment of meaningful performance indicators which can subsequently be monitored and reported on as necessary.
- (b) Should the EU decide, as proposed by the Commission, to provide further financial assistance in the next multi-annual financial framework, this support should be made conditional upon an *ex-ante* evaluation of the EU added value of such intervention, identifying the specific activities to be financed through the EU budget and taking account of other funding facilities such as Structural Funds.

INTRODUCTION

Background

1. Decommissioning is the final step in the life-cycle of a nuclear power plant, whose lifetime is typically 30-40 years, and up to 60 years for the newest installations (see ***Annex I***). Decommissioning covers preparatory activities prior to the final shut-down (such as elaboration of a decommissioning plan, preparing the licensing documentation and waste infrastructure projects) and all activities after the reactors are shut down, like the removal of spent fuel elements, the decontamination, dismantling and/or demolition of the nuclear installations, the disposal of remaining radioactive waste materials and the environmental restoration of the contaminated site. The decommissioning process ends when the installation is released from any regulatory control and radiological restriction.

2. The decommissioning process produces large volumes of material. Their disposal as waste has very significant environmental and financial costs². This is why, on the basis of the 'polluter pays principle' and according to agreed international practice, it is recommended that, by the time a nuclear installation has been permanently shut down, its operators should ensure the availability of adequate financial resources for safe decommissioning. These resources should aim to cover all aspects of decommissioning, from the technical decommissioning of the installation to waste management. If, during implementation, the decommissioning project proves to be more expensive

² According to the Commission, the amount needed to rehabilitate the site for a nuclear plant is around 10 to 15 % of the initial investment cost for each reactor to be decommissioned (See COM(2004) 719 final of 26 October 2004 - Report on the use of financial resources earmarked for the decommissioning of nuclear power plants).

than the approved cost estimate, the operator should cover the additional expenses³.

3. In the event of an early closure, countries face further social, economical and financial consequences. This is essentially due to a fall in the expected production and sale of electricity and the need to fund alternative sources.

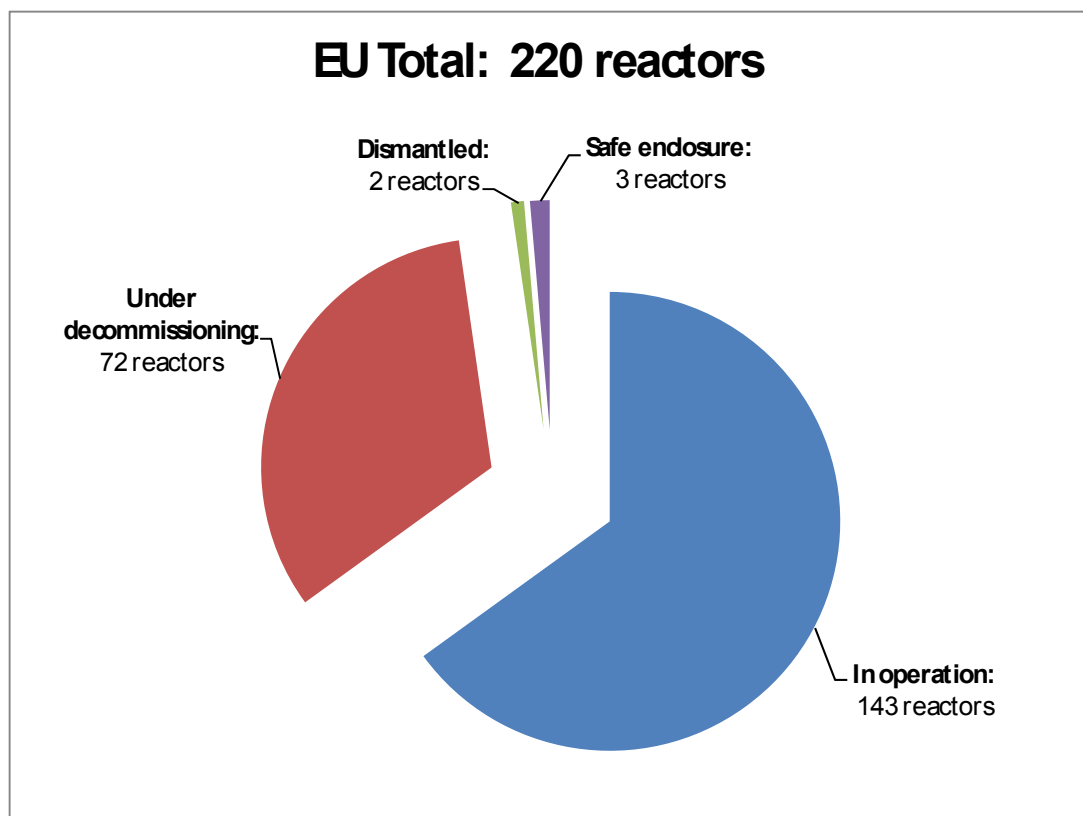
4. The decommissioning of nuclear reactors will be an increasingly important issue in the years ahead. There is a growing number of nuclear plants across Europe that are already being decommissioned or will be in the short/mid term. At the end of June 2011, there were 220 nuclear reactors in the European Union. As shown in **Figure 1**, 77 of these reactors had been shut down and most of them were under decommissioning. Also, around one third of the 143 reactors operating in 14 EU Member States will need to be shut down by 2025⁴. Finally, it is possible that Member States and nuclear operators will have to face the early closure of further plants as a result of the “stress tests” to be undertaken on nuclear reactors by the end of 2011⁵.

³ See paragraphs 3, 4 and 13 of Commission Recommendation 2006/851/Euratom of 24 October 2006 on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste (OJ L 330, 28.11.2006, p. 31). In July 2003, an inter-institutional statement by the European Parliament, the Council and the Commission highlighted the need for adequate financial resources for decommissioning and waste management activities (See OJ L 176, 15.7.2003, p. 56). See also International Atomic Energy Agency's (IAEA) Technical Document No 1476 on the Financial Aspects of Decommissioning (http://www-pub.iaea.org/MTCD/publications/PDF/te_1476_web.pdf).

⁴ See COM(2007) 794 final of 12 December 2007, p. 10 - Second report on the use of financial resources earmarked for the decommissioning of nuclear installations, spent fuel and radioactive waste.

⁵ Following the incident at the nuclear power plant of Fukushima Daiichi in March 2011, the European Council decided that the safety of all EU nuclear plants should be reviewed following a comprehensive and transparent risk and safety assessment ("stress tests"). The European Council resolved to assess initial findings by the end of 2011, based on a report from the Commission (see Presidency Conclusions 24-25 March 2011, paragraph 31).

Figure 1 – Nuclear power reactors in the EU as at June 2011



Source: International Atomic Energy Agency's Power Reactor Information System.

EU financial assistance to support nuclear decommissioning in Bulgaria, Lithuania and Slovakia

5. The Chernobyl accident in 1986 and its cross-border impact highlighted the global importance of nuclear safety. This event generated broad concern with regard to the operation of non-upgradeable nuclear reactors in Central and Eastern Europe. Hence, with a view to increasing nuclear safety, the international community, and the European Union in particular, decided, from the early 1990s, to provide various forms of financial assistance to several countries⁶.

⁶ The main vehicles for EU funding were the TACIS programme (providing technical assistance to the partner States in Eastern Europe and Central Asia)

6. In the framework of the accession negotiations to the European Union, Bulgaria, Lithuania and Slovakia committed themselves to the early closure and subsequent decommissioning of eight reactors (see **Figure 2**).

Figure 2 – Nuclear plants subject to early closure

Nuclear Power Plant	Reactor unit (and type)	Start of commercial operation	Theoretical closure date (as per design)	Actual closure date (in line with agreement)	End of decommissioning (current forecast)
Kozloduy (Bulgaria)	Unit 1 (VER440 / 230)	1974	2004	2002	2035
	Unit 2 (VER440 / 230)	1975	2005	2002	2035
	Unit 3 (VER440 / 230)	1981	2011	2006	2035
	Unit 4 (VER440 / 230)	1982	2011	2006	2035
Ignalina (Lithuania)	Unit 1 (RBMK 1500)	1984	2013	2004	2029
	Unit 2 (RBMK 1500)	1987	2017	2009	2029
Bohunice V1 (Slovakia)	Unit 1 (VER440 / 230)	1980	2008	2006	2025
	Unit 2 (VER440 / 230)	1981	2010	2008	2025

Source: European Court of Auditors, on the basis of the International Atomic Energy Agency's Power Reactor Information System and the technical documentation gathered during the audit.

7. The EU recognised that, given the significant proportion of production capacity loss, this commitment represented an exceptional burden for the countries concerned. Therefore, in order to help them meet this commitment, the EU decided to provide a financial contribution with the twofold objective of:

and the PHARE programme (supporting financial and technical cooperation with the candidate Central and Eastern European countries). A number of countries benefited from this assistance (Bulgaria, Czech Republic, Hungary, Lithuania, Romania, Slovakia, Slovenia, Armenia, Kazakhstan, Russia and Ukraine). The Court reported on the use of these funds in its Special Report No 25/98 (OJ C 35, 9.2.1999, p. 1).

- (a) supporting recipient countries' efforts to decommission their closed nuclear reactors ('decommissioning measures'), and
- (b) contributing towards addressing the consequences of the early closure ('mitigation measures').

8. The funding scheme put forward by the Commission did not benefit from a comprehensive *ex-ante* evaluation⁷. Funding was to be available as a general allocation, based on beneficiary countries' actual payment needs and absorption capacity. The programmes were set to support broadly defined priorities : decommissioning, environmental upgrading, modernisation and replacement of conventional generating capacity, other consequential measures contributing to modernisation of energy production, transmission and distribution and to securing energy supply and improving energy efficiency. The total cost and the relative importance of these priorities, the EU's share of it and time limits for EU intervention were not defined. Ceilings on funding available were set for each financial framework⁸.

Utilisation and management of EU financial assistance

9. As shown in **Figure 3**, total EU funding amounts to 2 850 million euro for the 1999-2013 period. At 31 December 2010, the Commission had committed over 70 % of the EU financial contribution (or 2 066 million euro). Payments to contractors stood at 1 030 million euro, representing almost half of committed

⁷ It is an EU legal requirement that the mobilization of EU resources must be preceded by an evaluation to ensure that the resultant benefits are in proportion to the resources applied (see Council Regulation (EC, Euratom, ECSC) No 2333/95 of 18 September 1995 amending the Financial Regulation of 21 December 1977 applicable to the general budget of the European Communities (OJ L 240, 7.10.1995, p. 1); see also article 27(4) of Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities (OJ L 248, 16.9.2002, p. 1).

⁸ In its document "A Budget For Europe 2020", Part I, COM(2011) 500 final of 29 June 2011, the Commission proposes the continuation of the EU financial support for decommissioning for the period 2014-2020 (Heading – Smart and inclusive Growth).

amounts⁹. Out of this amount, some 60 % and 40 % respectively went to decommissioning and mitigation measures. An overview of the programmes' financial flows is presented in **Annex II**.

Figure 3 – Breakdown of EU support by programme

Programme	EU contribution (million euro)	Percentage of the total
Kozloduy	870	30,5%
Ignalina	1 367	48,0%
Bohunice	613	21,5%
Total	2 850	100,0%

Source: Legal bases and Commission's accounting.

10. In line with the relevant provisions¹⁰, the Commission delegated the management of most (83 %) of the EU financial assistance for the country programmes to the European Bank for Reconstruction and Development (EBRD) which had managed nuclear safety projects and decommissioning facilities since the early 1990's. To this end, together with some European countries, three International Decommissioning Support Funds were set up in

⁹ The Commission earmarks appropriations to the specific agreements signed with the intermediary bodies (or, in some cases, with the beneficiaries) through the authorisation of individual commitments. Payments are subsequently authorised on this basis to intermediary bodies, which then allocate these resources to specific projects and contracts. Ultimately, the resources are disbursed by the intermediary bodies to the contractors.

¹⁰ The Financial Regulation No 1605/2002 (see articles 53 to 57) provides that subject to certain conditions, the Commission may delegate its implementation tasks. Moreover, the Accession Treaties and the relevant Council Regulations provide specifically that the Commission could do this.

2001¹¹. A Framework Agreement was signed between the recipient countries, the EBRD and the fund donors (see footnote 10).

11. Under the framework of the Council Regulations, the EBRD is required to manage the public funds allocated to the programmes for decommissioning nuclear power plants and monitoring the financial management of these programmes so as to optimise the use of public money. In addition, the EBRD should carry out the budget tasks entrusted to it by the Commission in line with the requirements of the Financial Regulation¹².

12. In addition, for Lithuania, the Commission delegated part of the assistance to a parallel structure, the Central Project Management Agency¹³ (CPMA). This followed consideration that the country had an appropriate national implementation structure. The agency's management responsibilities are similar to those of the EBRD.

¹¹ The EU is the main contributor to the three International Decommissioning Support Funds (96 % of the total). Other European donors have contributed 60 million euro. These are: Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Luxembourg, the Netherlands, Austria, Poland, Finland, Sweden, the United Kingdom, Norway and Switzerland. Since 2004, the EU is the only contributor.

¹² See Council Regulation No 647/2010 of 13 July 2010 (Bulgaria), Council Regulation No 1990/2006 of 21 December 2006 (Lithuania) and Council Regulation No 549/2007 of 14 May 2007 (Slovakia). The EBRD manages EU funds under the 'joint management' mode of budget implementation, which involves the delegation of management functions to international organisations. Delegation is subject to application of standards for accounting, audit, internal control and procurement procedures that offer guarantees equivalent to internationally accepted standards (Article 53d of Regulation No 1605/2002).

¹³ The CPMA manages EU funds under the 'indirect centralized management' mode of budget implementation, which involves the delegation of selected tasks by the Commission to a national agency. Delegation is subject to application of standards for accounting, audit, internal control and procurement procedures which offer guarantees equivalent to internationally accepted standards (Articles 53a, 54 to 57 of Regulation No 1605/2002). The CPMA manages 332 million euro, or 16 % of the total support committed to three countries until the end of 2010.

13. The three recipient countries propose projects for assistance in consultation with the EBRD or the CPMA. In the case of the three support funds, the assemblies of donors (where the Commission is represented) approve the projects. In the case of the CPMA channel, the Commission directly approves the projects. In 2007, a Member States' Management Committee was put in place to assist the Commission in the implementation of the assistance programmes. The contribution may amount up to 100 % of project costs. There is however, an expectation that every effort should be made to continue the co-financing practice established under the pre-accession assistance¹⁴.

14. External contractors under the responsibility of the grant recipients usually execute projects¹⁵. The relevant national authorities, the EBRD or the CPMA monitor the project execution. On the basis of their reports, the assemblies of donors and the Commission, respectively, supervise the implementation of the projects.

15. The Commission is ultimately responsible for the use of EU funds, which are managed by its Directorate-General for Energy.

AUDIT SCOPE AND APPROACH

16. The Court's audit covered the implementation of the three decommissioning programmes from 1999 until the end of 2010. The main objective was to assess the effectiveness of the EU funded nuclear decommissioning programmes against their twofold objectives (see paragraph 7). The audit sought to answer three questions:

¹⁴ The Council Regulations adopted in 2006, 2007 and 2010 envisage this possibility (see footnote 12).

¹⁵ The plant operators are the main grant recipients of the decommissioning projects. Main beneficiaries of the mitigation projects are public bodies or private companies.

- (a) Have programme actions for decommissioning been designed in accordance with identified needs and have they been carried out as planned so far?
- (b) Have programme actions to mitigate the consequences of the early closure of the reactors been designed in accordance with identified needs and have they been carried out as planned so far?
- (c) Have the accountability and governance arrangements been adequate to ensure an effective use of EU funds?

17. The audit work included:

- a review of preparatory and legislative documentation related to the programmes and an analysis of relevant technical and financial information;
- interviews at the Commission, EBRD and CPMA, the relevant ministries of the recipient countries and the nuclear power plants;
- the review of international standards and best practice cases, in particular the decommissioning process of the Greifswald Nuclear Power Plant¹⁶;
- consultation with experts in the field of decommissioning projects;
- the review of the scope and timing of the 149 projects in the current portfolios against identified needs and overall programme objectives; and
- the assessment of the results of a judgmental sample of 22 projects (16 for ‘decommissioning’ and 6 for ‘mitigation’) with visits in all three recipient countries¹⁷.

¹⁶ Decommissioning of the Greifswald plant (Germany) is regarded as best practice by a number of international organisations (the International Atomic Energy Agency, the Nuclear Energy Agency and the Commission).

OBSERVATIONS

Progress achieved in the decommissioning of the reactors

18. As indicated in paragraph 6, the aim of improving nuclear safety was to be achieved through the early closure of the eight non-upgradeable reactors and their subsequent decommissioning. Bulgaria, Lithuania and Slovakia have closed these reactors in line with their commitment. Concerning decommissioning, important milestones have been reached, but the main process is still ahead of us.

The identification of decommissioning activities is still in progress

19. The detailed planning and management of all activities to be undertaken in the decommissioning process is a key factor for its success. International standards provide that prior to the implementation phase of decommissioning activities, a decommissioning plan must establish how the project will be managed. The plan should be based on a decommissioning strategy and identify the subsequent actions to be undertaken, from reactors shutdown until the final disposal or storage of waste¹⁸.

¹⁷ Procurement procedures were subject to a limited review on the basis of the implementing bodies' own procedures. Contracts financed via the International Decommissioning Support Funds managed by the EBRD are put out to tender by the grant recipients. Firms are selected according to EBRD procurement rules. Acting as a Fund administrator, the EBRD monitors the procedure. CPMA conducts procurements according to national public procurement rules.

¹⁸ This includes the site management plan, the roles and responsibilities of the organizations involved, safety and radiation protection measures, quality assurance, a waste management plan, documentation and record keeping requirements, a safety assessment and an environmental assessment and the criteria therefore, surveillance measures during the implementation phase, physical protection measures as required, and any other requirements established by the regulatory body (see International Atomic Energy Agency's Safety Requirement No. WS-R-5, Decommissioning of facilities using radioactive material, p.10, Vienna, 2006, and the technical document No 1394, "Planning, managing and organizing the decommissioning of nuclear facilities: lessons learned", Vienna, May 2004).

20. An assessment of the decommissioning planning documents for the three plants is summarised in **Figure 4**. Several weaknesses were noted:

- (a) A classification and quantification of waste to be treated must be prepared to serve as basis for the adequate identification of decommissioning activities. In the case of the Bohunice V1 plant, a waste inventory was completed in July 2010. In the case of Ignalina and Kozloduy plants, however, radioactive waste inventories were not complete as the concrete quantities of each type of radioactive material to be processed were not yet known (the radiological characterisation of the plants was not finished). The planning documents being used by the plant operators were still based on provisional data on radioactive waste.
- (b) Decommissioning plans are expected to contain radioactive waste management plans identifying the specific activities, facilities and technologies required for the dismantling, conditioning, transport, storage and final disposal of all waste types, especially the most critical materials (reactor vessels, primary cooling circuits and other large volume activated components and high level radioactive waste). Even in the only case where the inventory has been completed (Bohunice V1), it has not yet been integrated into a detailed decommissioning plan defining in detail how identified waste will be treated and disposed during the whole duration of the decommissioning process. The current plan focuses only on the first phase of decommissioning, which almost exclusively covers non radioactive materials.
- (c) Decommissioning plans should estimate the full cost of the decommissioning process as a whole and be updated as frequently as required to ensure the validity of the estimations. However, the estimates contained in the decommissioning plans available at the end of 2010 are not complete, since the accurate information concerning quantities of each type of radioactive waste to be treated and/or the facilities and technologies

required for their treatment is unavailable. Moreover, these plans do not cover the plants' decommissioning processes in their entirety.

- (d) In order to monitor adequately the decommissioning process, there should be a link between the individual projects, the activities foreseen in the decommissioning plans and their estimated cost. None of the three programmes meets this standard.

Figure 4 – Assessment of decommissioning planning

Audit question	COURT'S ASSESSMENT		
	KOZLODUY PROGRAMME	IGNALINA PROGRAMME	BOHUNICE V1 PROGRAMME
Has a complete waste inventory been prepared?	No	No	Yes
Have waste management plans been defined?	Partly	Partly	Partly
Have decommissioning costs been adequately estimated?	Partly	Partly	Partly
Were there satisfactory arrangements for monitoring the decommissioning plans implementation?	No	No	No

Major infrastructure projects face delays and cost-overruns

21. As at 31 December 2010, the programmes had launched 101 projects which contributed towards the decommissioning of the eight reactors. The total value of these projects, which were almost exclusively funded by the EU, was 1 125 million euro. **Figure 5** provides an overview of the decommissioning projects financed by the audited programmes.

Figure 5 - Overview of decommissioning projects by programme and financial channel

Programme	Financial channel	No of projects	Total project value	Total EU support
			(million euro)	(million euro)
Kozloduy	KIDSF	30	334,1	318,4
Ignalina	IIDSF	17	421,9	390,7
	CPMA	21	146,9	135,3
Bohunice V1	BIDSF	33	222,2	203,7
	Total	101	1 125,1	1 048,1

Source: European Court of Auditors, on the basis of the information provided by the EBRD and the CPMA.

22. An analysis of the infrastructure projects visited on site (see **Annex III**) shows delays and cost overruns. In particular, key projects within the critical path of the decommissioning process are delayed, for example facilities for spent fuel and radioactive waste management (i.e spent fuel storage facilities and facilities for radioactive waste treatment, storage and final disposal).

Box 1 - Delays and cost overruns

In Bulgaria, an experimental plasma melting technology was selected in Kozloduy without proper demonstration of its effectiveness and without due consideration of the design and construction costs (some 30 million euro compared to one fifth for traditional technologies).

In Lithuania, at the time of the audit visit, the major infrastructure projects which are a precondition for the decommissioning of the Ignalina Nuclear Power Plant were significantly delayed comparing to initial contracts completion dates. This concerns notably: the interim spent fuel facility- more than 32 months; the solid waste retrieval

facility - 44 months; the solid waste treatment and storage facility for the management of short-and long lived low and intermediate level radioactive waste - 34 months. The total project cost of the interim spent fuel facility increased by 22 million euro (15,6 %).

In Slovakia, the interim radioactive waste storage at the Bohunice site, initially expected to be commissioned in 2010, was still in procurement process during the audit. As a result, the availability of buffer storage areas has been identified as a potential bottleneck. The facility for the free release of decommissioning materials was delayed by more than one year. Until the facility is operational, no material can be released from Bohunice V1 NPP.

The funding shortfall is significant

23. In March 2011 the recipient Member States updated their decommissioning cost estimates, to reach 5,3 billion euro¹⁹. A comparison with the decommissioning funding currently available at national and programme level suggests a shortfall of around 2,5 billion euro (see **Figure 6**).

¹⁹ Contributions to the meeting of the Nuclear Decommissioning Assistance Programme Committee of 16 March 2011.

Figure 6 - Decommissioning funding shortfall

	Estimates in the Decommissioning Plans (million euro)	Latest cost estimate (million euro)	Available funding (all sources) (million euro)	Funding shortfall (million euro)
Kozloduy NPP Units 1 to 4	1 118	1 243	664	579
Ignalina NPP Units 1 and 2	2 019	2 930	1 450	1 480
Bohunice V1 Units 1 and 2	950	1 146	720	426
TOTAL	4 087	5 319	2 834	2 485

Source: Decommissioning plans and Information provided during the Nuclear Decommissioning Assistance Programme Committee meeting of March 2011.

24. Slovakia has committed itself to topping up the funding needed for decommissioning²⁰ and has created a specific funding mechanism (a tax on electricity transmission) to contribute towards reducing the funding shortfall. Lithuania and Bulgaria have not put in place any equivalent mechanism. The absence of sufficient funding arrangements puts the completion of the decommissioning processes at risk.

Progress achieved in mitigating the effects of the plants' closure

Inadequate mitigation needs assessment

25. In accordance with the principles of sound financial management, it is a good practice for any spending programme to set its objectives on the basis of a needs assessment²¹. This implies an evaluation, following international standards, of the consequences of early closure (e.g. loss of electricity power,

²⁰ COM(2004) 624 final of 29.9.2004, p. 3.

²¹ Footnote 9.

security of supply). The design of potential measures to be undertaken should consider their cost in relation to their mitigation effect²². The extent of mitigation achieved by funded projects must be assessed in view of determining whether the mitigation objectives may be considered fulfilled.

26. **Figure 7** summarises the result of the Court's review of needs assessments underlying the strategic plans defined for the audited programmes. A needs assessment at programme level leading to a concrete mitigation strategy was initially carried out for the Kozloduy programme only. However, this needs assessment is outdated and no longer relevant. As a consequence, any project fitting with the national energy strategy is by definition considered to be a consequence of the closure of the plants.

27. An estimate on potential impact of planned projects has been carried by the EBRD in the case of Kozloduy only. As regards the actual achievements of the mitigation actions and their contribution to the programme objectives, neither the implementing bodies (EBRD, CPMA) nor the Commission have assessed them.

Figure 7 – Assessment of mitigation planning

Audit question	COURT'S ASSESSMENT		
	KOZLODUY PROGRAMME	IGNALINA PROGRAMME	BOHUNICE PROGRAMME
Has a need assessment at programme level been carried out?	Yes	No	No
Has the mitigation achieved by the programmes been evaluated?	Partly	No	No

²² Commission Recommendation 2006/851/Euratom.

Broad variety of mitigation activities financed

28. The programmes supported a number of measures to mitigate the effects of the loss of electricity production subsequent to the early closure of nuclear plants. As of 31 December 2010, the programmes had launched 48 projects contributing to the mitigation of the early closure of the three plants. The total value of these projects was 1,34 billion euro. The EU funded over half of this amount. **Figure 8** provides an overview of the mitigation projects financed by the three audited programmes.

Figure 8 - Overview of mitigation projects by programme and financial channel

Programme	Financial channel	No of projects	Total project value	Total EU support
			(million euro)	(million euro)
Kozloduy	KIDSF	28	454,8	241,8
Ignalina	IIDSF	3	475,5	260,4
	CPMA	10	36,1	36,1
Bohunice V1	BIDSF	7	376,8	190,4
	Total	48	1 343,2	728,8

Source: European Court of Auditors, on the basis of the information provided by the EBRD and the CPMA.

29. The site visits confirmed that the individual projects were in line with the broadly defined priorities of the programmes and contributed to mitigate the effects of the early closure of the eight nuclear reactors (see **Annex IV**). However, the degree of mitigation achieved is not known. Moreover, a direct link with the early closure of reactors could not always be established and the existence of a prioritization of mitigation activities could not be demonstrated (see **Box 2**). In a situation where the resources are already insufficient, this risks the achievement of the programmes' objectives, and delays the completion of the decommissioning process.

Box 2 - Weak relationship between mitigation activities and reactors' early closure

In Bulgaria, the programme funded energy efficiency improvements in public buildings (schools, hospitals, ministry buildings, theaters). The link with the closure of Kozloduy units 1 to 4 is that the energy upgrading will compensate for a small part of the production loss, provided that consumption patterns are maintained.

In Lithuania, the programme provided a contribution to the Housing and Urban Development Agency's mechanism for refurbishment of multi-family buildings, created to upgrade the energy efficiency of 24 000 residential buildings. The Ignalina programme supported one third of some 570 individual projects actually launched under this scheme. The link with the closure of Ignalina Nuclear Power Plant is that energy upgradings will reduce consumption and therefore compensate part of the production loss. In September 2009, the mechanism was terminated and replaced by a financial engineering instrument funded by the Structural Funds.

In Slovakia, the modernisation of the 220kV transmission network was funded by the programme under the consideration that Bohunice V1 was its main power supplier. However, the grid was already obsolete by the time the closure had been decided, and it would have required modernisation even if the plant had been kept operational. The upgrading mainly benefited the other contributors to the transmission network (for instance, other nuclear power plants).

Programme accountability and management organisation

Weak accountability for programmes' performance

30. Effective management requires the definition of clear lines of responsibility for the use of programmes' resources and the achievement of their objectives. Whatever the management method, the Commission should be in a position to exercise its ultimate responsibility for the implementation of the programmes and be held accountable for the use of the funds²³.

²³ The Treaty provides that the Commission implement the EU Budget on its own responsibility (articles 17(1) TEU and 317 TFEU). A requirement for quantification of the objectives and monitoring of the progress of their realization is set in EU legislation since 1990 (See Council Regulation (Euratom, ECSC, EEC) No 610/90 of 13 March 1990 amending the Financial Regulation of 21 December 1977

31. The programmes' management includes several levels. In particular, responsibilities for setting-up the programmes involve the Commission, the EBRD, the CPMA, the Assembly of Contributors to the International Decommissioning Support Funds, Nuclear plants operators and the Member States concerned. The Commission did not ensure that the broad priorities set out in the Accession Treaties and subsequent Council Regulations (see paragraph 8) were translated into a coherent set of detailed targets and indicators.

32. None of the above mentioned bodies has established a system to monitor and assess the progress towards the achievement of the overall objectives of the programmes, the decommissioning of the eight reactors and the mitigation of their closure. Monitoring and reporting on programme achievements at all levels were therefore difficult.

33. In July 2011, the Commission reported on the decommissioning programme for Lithuania, Slovakia and Bulgaria, namely concerning its administration, the expenditure incurred and the progress of key projects²⁴. Some information on the progress of the three decommissioning programmes was also provided in support of the yearly Commission Decisions on financing and on the two general reports produced by the Commission in 2004 and 2007 on the use of financial resources earmarked for the decommissioning of nuclear power plants in all 27 Member States²⁵.

applicable to the general budget of the European Communities). The concept has been further developed in 2002 with the introduction of the SMART standard (see article 27(3) of Regulation No 1605/2002).

²⁴ Report from the Commission to the European Parliament and the Council on the use of financial resources during 2004-2009 provided to Lithuania, Slovakia and Bulgaria to support the decommissioning of early shut-down nuclear power-plants under the Acts of Accession (COM(2011) 432).

²⁵ COM(2004) 719 and COM(2007) 794. A third report is currently under preparation.

34. The 2011 report constitutes the first consolidated assessment of the use of financial resources earmarked for Bulgaria, Lithuania and Slovakia or the progress of the programmes. However, it does not provide a clear indication as to the achievement of overall decommissioning and mitigation objectives. Before the publication of this report, the only available source in this respect was a mid-term evaluation published in 2007²⁶, which excluded the Kozloduy Programme on the grounds that it stemmed from a different legal basis.

35. The lack of sufficient information combined with the number of management levels led to diffused responsibilities. It was not clear who had overall responsibility for implementing the programme, in particular whether EU funds were having the desired effect. The Commission's supervision has focused on the budgetary execution of the financial appropriations and project implementation, rather than on the extent of the progress achieved towards the programme objectives as a whole.

36. Insufficient measuring of progress towards the realisation of the programmes' goals and inadequate monitoring of the effective use of resources mean that no one is accountable for overall programme's performance.

Incomplete organisational changes

37. The success of the decommissioning process in meeting the intended results, on time and at a reasonable cost depends on the capacity to adapt to evolving needs. This means in particular achieving a smooth transition of the

²⁶ Mid-term evaluation of the decommissioning assistance to Lithuania and Slovakia provided under the protocols to the Treaty of Accession, Final Report, September 2007. Its overall conclusion is that the EU decommissioning assistance programme in the countries concerned is 'a mixed bag'. A key element stands out, that the EU decommissioning assistance is not based on a coherent strategy.

the nuclear power plants from an operating to a decommissioning organisation²⁷. To this end an internal management structure should:

- prioritize the allocation of the available resources;
- coordinate and monitor all activities until the completion of the decommissioning process, and
- direct the decommissioning teams to ensure the safety and cost effectiveness of the project.

38. A significant part of the programmes' expenditure (26 %) has been allocated to promote the planning and implementation of the decommissioning process, notably through:

- fully covering the costs of specialised decommissioning consultancy services embedded in the plant operators' organisations, worth 125 million euro, and
- financing personnel costs worth 147 million euro for around 1 500 employees in all three plants.

These costs are additional to the operational costs of the EBRD (16,8 million euro) and the CPMA (1,5 million euro).

39. The reactors were shut-down between 2002 and 2009. However, the programmes have yet not triggered the required organisational changes to turn the operators into effective decommissioning organisations. It is noted in particular that:

²⁷ See IAEA, Organization and management for decommissioning of large nuclear facilities, Technical reports series No 399, Vienna 2000; Planning, managing and organizing the decommissioning of nuclear facilities: lessons learned, IAEA-TECDOC-1394, Vienna, May 2004; Decommissioning of facilities using radioactive material, Safety requirements No WS-R-5, Vienna, 2006.

- the decommissioning organisations or services have limited influence on priority setting and subsequent allocation of available resources;
- due to the absence of adequate planning and monitoring tools, they cannot assess progress achieved in the implementation of the decommissioning plans, and that
- responsible departments are still very dependent on the work of the external consultants, even for tasks of a purely administrative nature.

CONCLUSIONS AND RECOMMENDATIONS

40. EU financial assistance to support decommissioning and mitigation measures in Bulgaria, Lithuania and Slovakia has helped these Member States to meet their commitments towards the early closure of eight nuclear reactors. Reactors are now closed and partly defuelled, major preparatory works have been implemented and dismantling works have started. However, after more than ten years of EU assistance, progress has been slow, as many projects still involve preparatory activities. Moreover, the situation is rather unclear concerning the needs still to be met as a result of the early closure since no comprehensive needs assessment exist.

41. As a result of a relatively loose policy framework, the programmes do not benefit from a comprehensive needs assessments, prioritization and the setting of specific objectives and results to be achieved. Basic data on radioactive waste management inventories (and their characterisations) are either missing or have not yet been developed into detailed decommissioning plans. Required radioactive waste processing and storage technologies and facilities have not yet been fully designed. Responsibilities are diffused. The Commission's supervision focuses on the budgetary execution and project implementation, rather than on the achievement of the programme objectives as a whole.

42. Although the overall cost for the completion of the programmes is unknown, it is clear that there is a significant funding shortfall. This puts at risk the completion of the decommissioning.

Recommendation – Establish the extent of EU support in a result-oriented way

(a) The Commission should put in place the conditions for an effective, efficient and economical use of EU funds. To this effect:

- It should establish a detailed needs assessment showing the progress of the programmes so far, the activities still to be performed and an overall financing plan identifying the funding sources from the different stakeholders.
- Before further spending takes place, the Commission should analyse the resources available and the expected benefits. This should lead in turn to objectives being aligned with the budget made available and to the establishment of meaningful performance indicators, which can subsequently be monitored and reported on as necessary for the programme implementation as a whole.

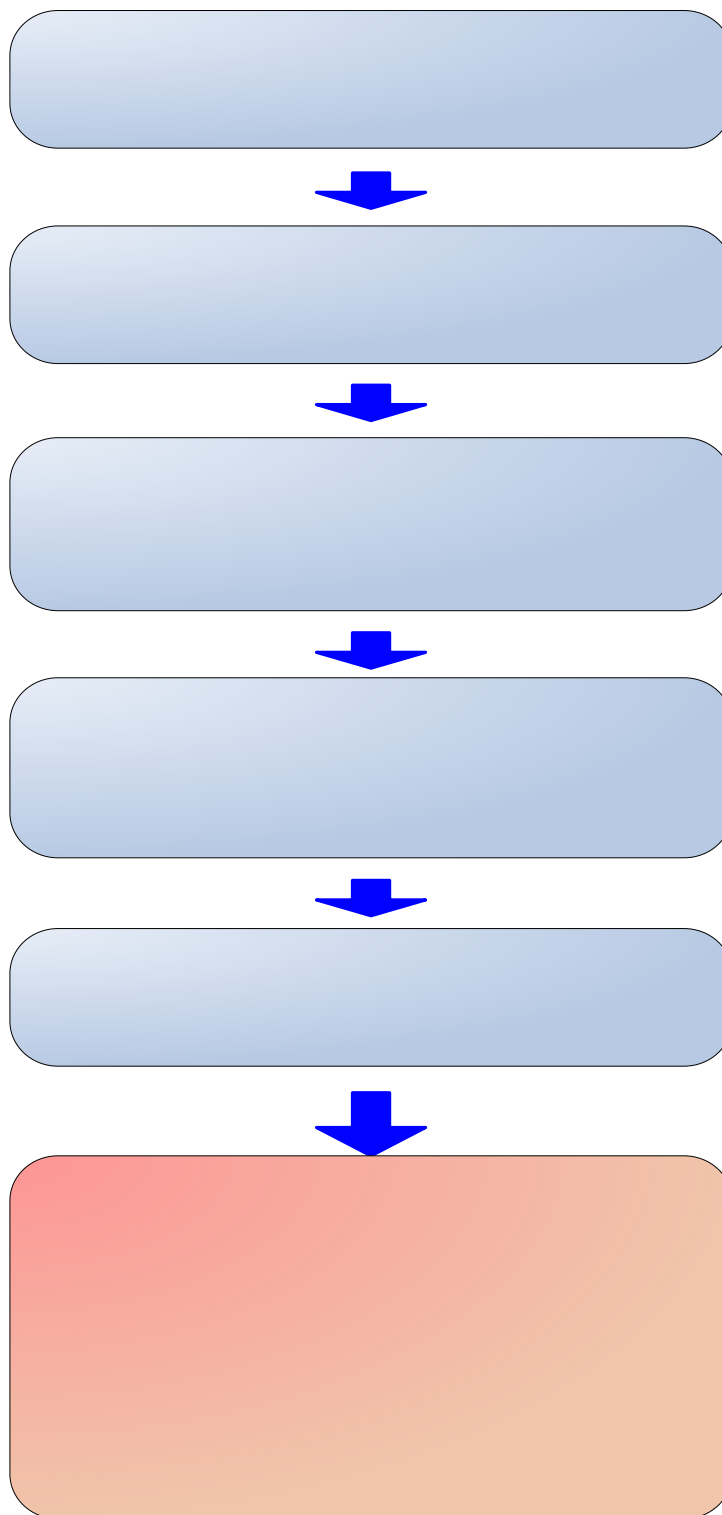
(b) Should the EU decide, as proposed by the Commission, to provide further financial assistance in the next multi-annual financial framework, this support should be based on an *ex-ante* evaluation of the EU added value of such intervention, identifying the specific activities to be financed through the EU budget, taking account of other funding facilities such as Structural Funds and the conditions for EU disbursements.

This Report was adopted by Chamber II, headed by Mr Harald NOACK,
Member of the Court of Auditors, in Luxembourg at its meeting of
26 October 2011.

For the Court of Auditors

Vítor Manuel da SILVA CALDEIRA
President

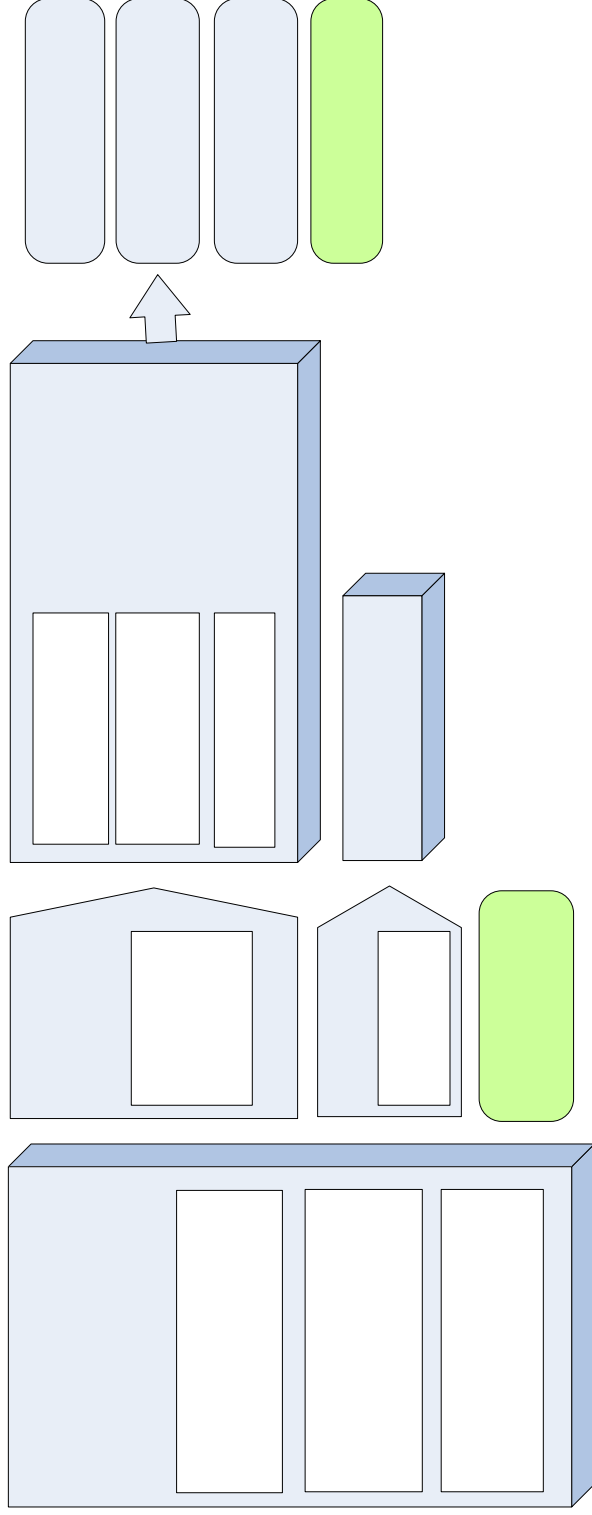
LIFE-CYCLE OF A NUCLEAR POWER PLANT



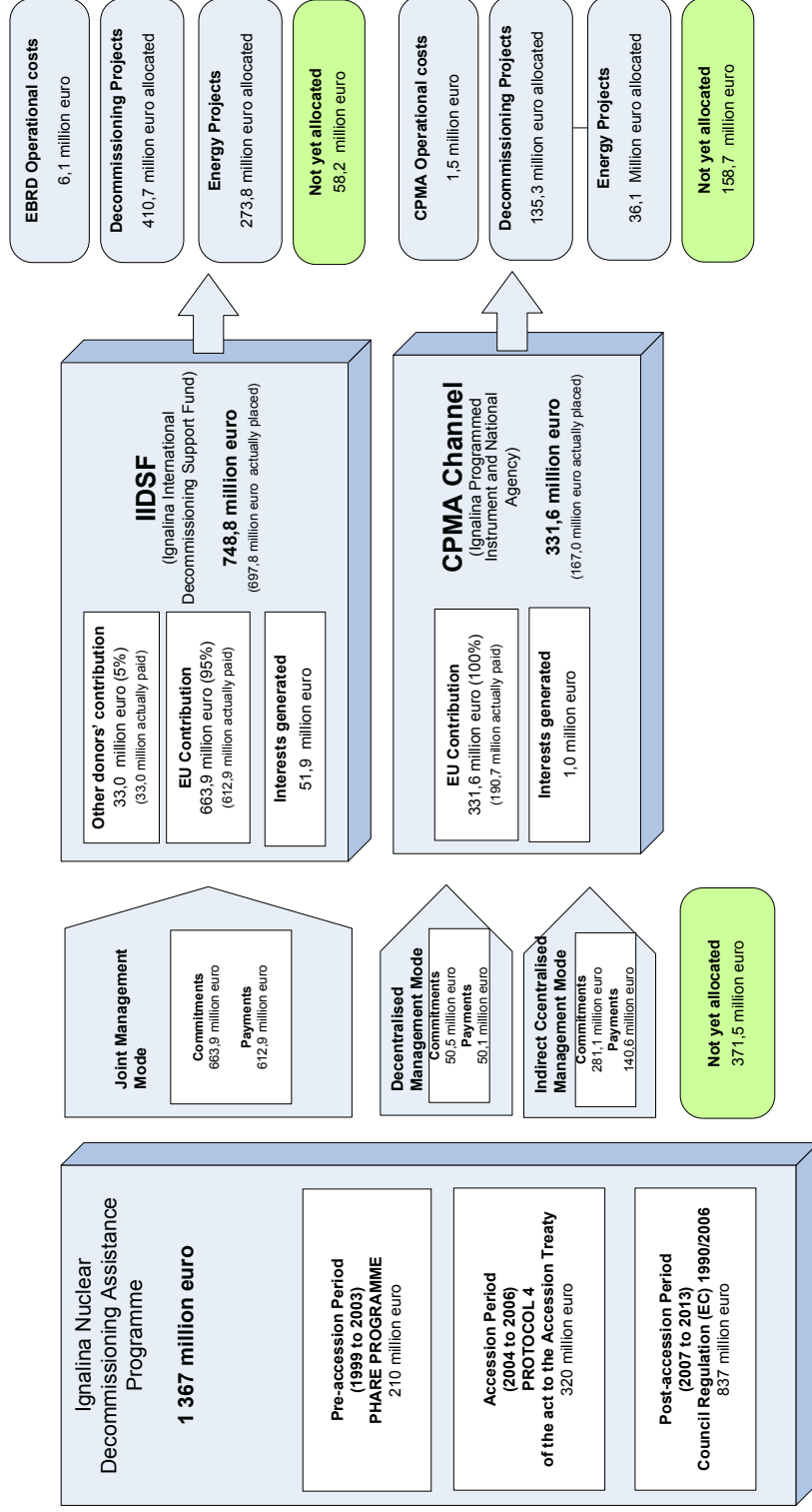
Source: European Court of Auditors, based on general guidance material published by the International Atomic Energy Agency and the Nuclear Energy Agency.

OVERVIEW OF FINANCIAL FLOWS AS AT 31 DECEMBER 2010

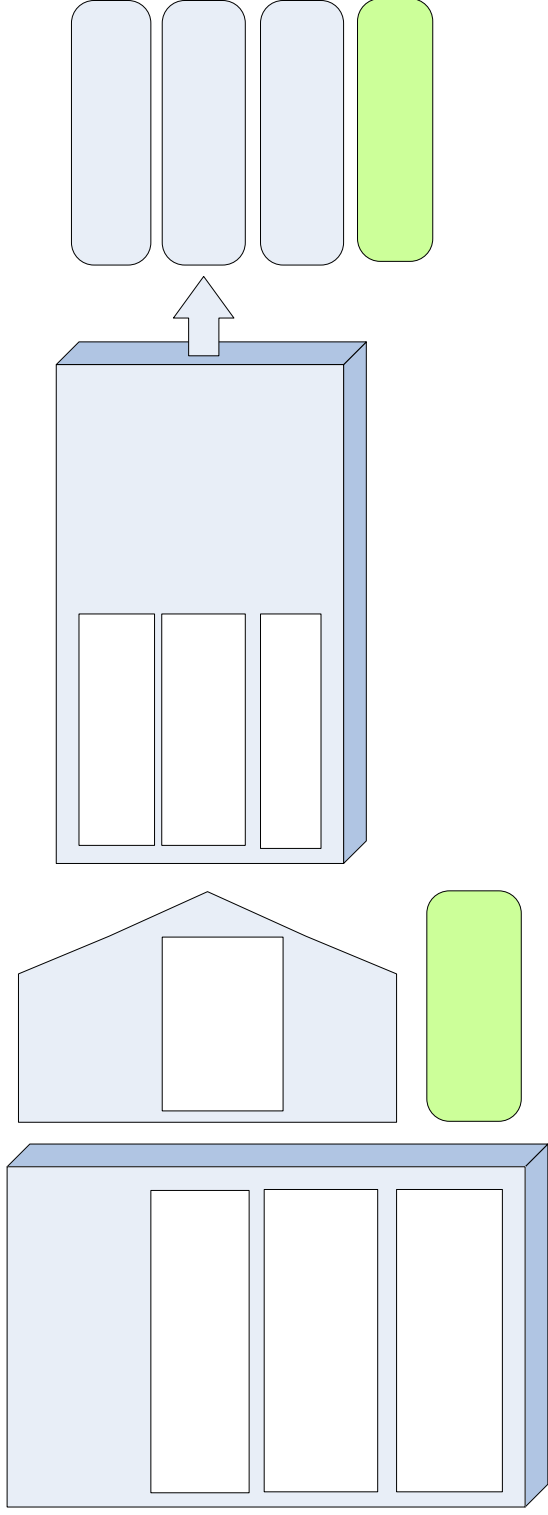
Kozloduy Programme (Bulgaria)



Ignalina Programme (Lithuania)



Bohunice V-1 Programme (Slovakia)



Bohunice Nuclear Decommissioning Assistance Programme

ASSESSMENT OF 16 DECOMMISSIONING PROJECTS

NPP	Project	Court's assessment
Bohunice	Audited project 1 - Project Management Unit – Consultancy services to support the Project Management Unit at Bohunice V1 Nuclear Power pPlant for the safe and cost-effective implementation of all decommissioning support activities funded by the BIDSF during the period 2003-2011, and to continue the systematic development of a Bohunice V1 decommissioning support project pipeline with particular emphasis on the period 2007-2013.	The Project Management Unit's consultant has played a key role in the design and implementation of the decommissioning process but insufficient progress was achieved in the formulation and implementation of the decommissioning strategy. There are also weaknesses in the organisational structure.
	Audited project 2 - Reliable Heat and Steam Supply and Reconstruction of the Auxiliary Boiler Station at the Bohunice Site: modification to the auxiliary steam systems to secure back-up for Bohunice V2 (the plant in operation), Bohunice A1 (a separate plant under decommissioning) and the existing spent fuel and radioactive waste facilities, after the shutdown of Bohunice V1.	The project has fully achieved its objectives. But this project does not have a clear link with the decommissioning process. It is more closely related to the operation of Bohunice V2 Nuclear Power Plant than to the closure of Bohunice V1.
	Audited project 3 - Storage Casks for Spent Fuel: the supply of 26 nuclear spent fuel compact storage baskets and the performance of any associated basket production, transport, testing and acceptance service.	The audit confirms the full achievement of the project objectives in line with its time plan and budget. It must be noted, however, that the purchased baskets will not be used for nuclear spent fuels actually removed from Bohunice V1 units and were therefore not required to progress on the decommissioning of the plant.
	Audited project 4 - Feasibility study on the enlargement of the National Repository at Mochovce.	There is a significant delay for this project due to the Bohunice V1 Nuclear Power Plant's failure to provide the information required for the execution of the study. Several factors risk limiting the potential use of the feasibility study.
	Audited project 5 - Implementation of the decommissioning Programme Using the Human Resources Available at Bohunice V1 Nuclear Power Plant: the financing of personnel taking part in preparation and implementation of decommissioning activities in view of preserving the experience and knowledge of the plant's staff.	The funding of the staff who contributed to the implementation of pre-decommissioning tasks, has not triggered an organisational change - allowing a clear demarcation of staff contributing to the transition towards a decommissioning organisation and - guaranteeing a centralised and adequate monitoring of the pre-decommissioning activities.

<p>Ignalina</p>	<p>Audited project 6 (IIDSF) - Interim storage for spent fuel assemblies from Ignalina Nuclear Power Plant Units 1 and 2: design and construction of an interim nuclear spent fuel storage facility for 19 000 nuclear spent fuel assemblies remaining in Units 1 and 2 to be stored in casks (designed and manufactured within the project).</p>	<p>There are significant delays in the implementation of the project. These delays have a major impact on the nuclear safety until all the spent fuel elements have been put in to cask and the plant's operational costs (additional maintenance costs).</p>
	<p>Audited project 7 (IIDSF) - Solid Waste Management and Storage Facility: the design, licensing support, procurement, construction and commissioning of new solid waste management and storage facilities to be built at Ignalina Nuclear Power Plant.</p>	<p>There are significant delays in the project implementation (sub-project B2, Solid Waste Retrieval Facility, was delayed by 44 months and sub-project B3/4, Solid Waste Treatment and Storage Facility, was delayed by 34 months). These delays are critical to the overall implementation of the decommissioning programme, since the waste management routes are needed at an early stage to allow implementation of first Dismantling and Decontamination projects, and are likely to result in additional IIDSF funding to achieve completion.</p>
	<p>Audited Project 8 (IIDSF) - Reliable heat and steam sources for Ignalina Nuclear Power Plant and Visaginas Town: the rehabilitation/replacement and extension of the obsolete temporary steam and heat back-up boiler station in order to ensure, after Unit 2 shutdown, continued reliable heat and steam supply to Ignalina Nuclear Power Plant during its decommissioning and to the district heating system in Visaginas town.</p>	<p>The project has met the initial objectives in nature, time and budget and contributes to the implementation of the decommissioning process. The project was needed first of all due to the obsolescence of the existing systems. The Decommissioning Project Management Unit's involvement to this project was not necessary due to fact that the construction was not directly linked to nuclear decommissioning concerns.</p>
	<p>Audited project 9 (IIDSF) - Engineering, planning and licensing of dismantling and decontamination activities and tools for dismantling and decontamination at Ignalina Nuclear Power Plant Unit 1 Turbine Building: preparation of the major engineering, planning and licensing documents, necessary to obtain authorization to implement the dismantling and decontamination activities at the Turbine Building of Ignalina Nuclear Power Plant Unit 1, and identification and procurement of the tools required to proceed with these dismantling and decontamination activities.</p>	<p>The externalisation of this project's activities was neither based on an adequate assessment of the availability of required skills and technical capacities within the plant's staff, nor was it based on the consideration of the cost-efficiency of the externalisation option.</p>
	<p>Audited project 10 (IIDSF) - Support to the Project Management Unit: the provision of management and engineering support to the Decommissioning Service Project</p>	<p>The Project Management Unit's Consultant has significantly contributed to the evolution of the decommissioning project. However several shortcomings have been identified: - the scope of the consultant's work contributes to</p>

	Management Unit at Ignalina Nuclear Power Plant.	increase its cost (performance of general project management and administrative tasks instead of focus on specific technical expertise on nuclear decommissioning matters); - insufficient development of the organisational structure of the Ignalina NPP.
	Audited project 11 (CPMA) - Ignalina Nuclear Power Plant site infrastructure: site preparation and infrastructure development (site clearance, electricity supply, heat supply, telecommunications, water supply) in support for the implementation of the major decommissioning projects.	This project was, in general, implemented satisfactorily. However, the significant delays incurred in the implementation of the 'parent' decommissioning projects (and sub-project B3/4 in particular, concerning the Solid Waste Treatment and Storage Facility, see audited project 7) have impacted the implementation of the site infrastructure related sub-projects.
	Audited project 12 (CPMA) - Landfill facility for very low radioactive waste: the design, construction and licensing of a landfill facility for very low level short-lived solid radioactive waste.	It should be noted - that the scope of this project does not include all necessary phases for the storage of radioactive waste in the facility - only the design of the landfill facility and the construction of buffer storage area, intended for the accumulation and safe interim radioactive waste storage between disposal campaigns is included; - that the project had accumulated significant delays in the construction licensing process

	<p>Audited project 13 - Project Management Unit – Consultancy services: consultancy support to assist Kozloduy Nuclear Power Plant in the implementation of the decommissioning support activities for Units 1 to 4.</p>	<p>Although the Project Management Unit’s consultant played a key role in the modification of the decommissioning strategy there are various shortcomings in the management of this project:</p> <ul style="list-style-type: none"> - project delays; - insufficiently reliable decommissioning cost estimates; - insufficient identification of decommissioning activities to be performed; - absence of radioactive waste inventories; - very substantial part of the consultancy work concerned project administration instead of technical advice on the implementation of the decommissioning process.
Kozloduy	<p>Audited project 14 - Dry Spent Fuel Storage Facility: the design and construction of a Dry Spent Fuel Storage Facility for storing spent fuel assemblies in casks.</p>	<p>There is a significant delay and budget overrun for this project :</p> <ul style="list-style-type: none"> - the completion of the Dry Spent Fuel Storage Facility is delayed by 2,5 years; - modifications to the initial requirements resulted in price increases and a modification of the price basis for the contract, causing a 19 % budget overrun so far.
	<p>Audited project 15 - Facility for Treatment and Conditioning of Solid Waste with High Volume Reduction Factor: the design, construction and commissioning of a Plasma Melting Facility to achieve high volume reduction factor of Low and Intermediate Level Radioactive Waste.</p>	<p>There is a major risk for cost deviation for this project. An experimental technology was selected without:</p> <ul style="list-style-type: none"> - proper demonstration of its effectiveness and - due consideration of the costs of operating the facility.
	<p>Audited project 16 - Human Resources: promotion of the efficient use of human resources available at units 1 to 4 of Kozloduy Nuclear Power Plant for the implementation of the Updated Decommissioning Strategy, maintaining the knowledge of people at the site, and ensuring a dynamic transition from operation to decommissioning.</p>	<p>The funding of the staff who contributed to the implementation of pre-decommissioning tasks, has not triggered an organisational change:</p> <ul style="list-style-type: none"> - allowing a clear demarcation of staff contributing to the transition towards a decommissioning organisation and - guaranteeing a centralised and adequate monitoring of the pre-decommissioning activities.

ASSESSMENT OF 6 MITIGATION PROJECTS

NPP	Project	Court's assessment
Bohunice	Audited project 1 - Reconstruction of the Križovany substation: provision of safe and reliable electricity supply to the national transmission system after Bohunice V1 Nuclear Power Plant final shutdown by reconstructing a 400 kV substation at Križovany, including equipment supply, installation, testing and commissioning, and related engineering and technical services during the period 2004-2009.	The audit confirmed the effective completion of the intended reconstruction works within the time limit and budget. However, there is only a weak link between this project and the closure of Bohunice V1.
	Audited project 2 (IIDSF) - Upgrading of Lithuanian Power Plant and construction of the Combine Cycle Gas Turbine: the environmental, energy efficiency and reliability upgrading of the 1800 MWe Lithuanian Power Plant in order to extend its lifetime and increase Lithuania's security of supply and the stability of electricity prices.	The audit confirmed that the project achieved its results although with a reduced project scope (reduction of upgraded Lithuanian Power Plant units). It is noted that subsequent events have modified the initial strategic factors considered for mitigation projects. As a result the Lithuanian Power Plant will only act as a production capacity reserve instead of replacing production capacity as originally planned.
Ignalina	Audited project 3 (CPMA) - Fitting of District Heating Substations in Visaginas Housing Areas 1 and 2+3: transformation of the district heating system of Visaginas town from 'open-type' to 'closed-type', in order to improve its efficiency and security of heat supply after the final shutdown of Ignalina Nuclear Power Plant.	The audit observed significant delays in the implementation of this project. The second phase, in particular, concerning Visaginas' second and third housing areas, has accumulated a delay of nearly 18 months compared to its implementation plan, so that CPMA considered terminating the project in its present form.
	Audited project 4 (CPMA) - Contribution to the Housing and Urban Development Agency's mechanism to support energy efficiency upgrading of multi-apartment residential buildings.	The on-the-spot visits confirmed the positive results reported by the Agency: heat energy savings between 30 % and 60 % of original consumption were realised for the co-financed projects. However, the limited share of the EU contribution allocated to the scheme through the CPMA channel within the overall mechanism (180 multifamily blocks, compared to the target population of 24 000 residential buildings) reduced the significance of these positive results.

Kozloduy	Audited project 5 - Bulgaria Energy Efficiency and Renewable Energy Credit Line Facility: the establishment of a credit facility intended to finance private sector companies for industrial energy efficiency and small renewable energy projects.	<p>The credit line facility has delivered results in line with the objectives set, contributing to the mitigation of the early agreed closure of Kozloduy Nuclear Power Plant units 1 to 4.</p> <p>However, the necessity of allocating further KIDSF funding to the facility is not fully justified, since funded sub-projects show economic viability and other European programmes address similar objectives.</p> <p>Relevant public authorities in Bulgaria are not involved in the management of the facility. The full externalisation of the project management limits the coordination of measures undertaken within the credit line facility with those implemented in the context of other national or European programmes.</p>
	Audited project 6 - Demand Side Energy Efficiency Measures in Public Buildings: upgrading of the energy efficiency of public buildings (hospitals, schools and other).	<p>The project has delivered results contributing to the mitigation of the consequences of the early closure of Kozloduy Nuclear Power Plant reactors 1 to 4. However, the existence of other national and European programmes addressing the same objectives questions the necessity of KIDSF funding for improving the energy efficiency in public buildings.</p>

REPLIES OF THE COMMISSION TO THE SPECIAL REPORT OF THE COURT OF AUDITORS

"EU FINANCIAL ASSISTANCE FOR THE DECOMMISSIONING OF NUCLEAR PLANTS IN BULGARIA, LITHUANIA AND SLOVAKIA: ACHIEVEMENTS AND FUTURE CHALLENGES"

EXECUTIVE SUMMARY

I. With the overall goal of improving nuclear safety, Bulgaria, Lithuania and Slovakia agreed to shut down 8 reactors in their EU accession treaties. These Treaties were ratified by all Member States. Without the EU funds provided for decommissioning and mitigation this would not have happened, particularly given the concerted political pressure in these three Member States, which reached its peak during the severe gas supply crisis in early 2009.

III. (a) The Accession Treaties set the policy framework for the EU's financial support without quantifying the expected achievements. The amounts fixed for this assistance were the outcome of political negotiations, which recognised the extraordinary burden placed on the Member States by the shutdown commitments. As such the amounts were not a specific proportion of the estimated costs, but rather an expression of solidarity between the EU and the concerned Member States.

In the intervening years the Commission has put in place a procedural framework that sets specific objectives, defines roles and responsibilities and clearly defines the reporting and supervision requirements. This framework allows the Commission to have a clear picture of the programme's achievements in all three Member States.

The Commission considers that the programmes have been successful in reaching the overall goal of significantly improving nuclear safety as well as helping Member States mitigate the effects of early closure.

The Commission intends to further define specific objectives, priorities and results to be obtained when making its legislative proposal for EU support under the next Multi-Annual Financial Framework. This proposal will take into account that all eight nuclear power plants have been closed, stayed closed and dismantling has started and the impacts of early closure have been mitigated through replacement of capacity and energy efficiency measures.

III.(b) In July 2011, the Commission reported to the Council and the European Parliament²⁸ on the progress of the three decommissioning programmes.

This report and the accompanying Commission staff working document contain detailed information on the use of financial resources, which was made available in the context described under III(a).

Delays and cost overruns are not unusual given that projects financed by the programmes are often long, complex and politically sensitive.

²⁸ COM (2011) 432 REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL On the use of financial resources during 2004-2009 provided to Lithuania, Slovakia and Bulgaria to support the decommissioning of early shut-down nuclear power-plants under the Acts of Accession and SEC (2011) 914 COMMISSION STAFF WORKING PAPER "Nuclear Decommissioning Assistance Programme data"

III.(c) For nuclear safety and licensing reasons, the organisational changes, which are the clear responsibility of the nuclear power plant operators and not the primary objective of the EU financing programmes, can only start once the last reactor unit has been shut down.

III.(d) The ultimate responsibility for decommissioning and its financing lies with the Member State in which the nuclear power plant is situated. It is not for the EU to make up any funding shortfall. Nevertheless, acknowledging the historical circumstances further EU financial contributions for the period 2014-2020 are currently under discussion in the Council and European Parliament following the Commission's recent Communication 'A budget for Europe 2020'. However, EU support will be conditional on the concerned Member States committing adequate additional resources.

IV.(a) The Commission has operated within the legal and procedural framework for an effective, efficient and economic use of EU Funds as described under III(a). It will continue to work within this framework until the end of 2013 but is further developing it for the next multiannual financial framework. The proposal to extend EU financial support for decommissioning beyond 2013 will be accompanied by an Impact Assessment.

The Commission will review its performance indicators so that they can be in place for the period after 2013.

IV.(b) The Commission will implement this recommendation, through its proposals for EU assistance beyond 2013, which will be accompanied by an impact assessment.

INTRODUCTION

2. Under normal circumstances, operators should ensure the financing of the decommissioning process; however, in line with its Recommendation 2006/851/Euratom, the Commission considers that, given their historical legacy from the communist period up to 1989, the EU support for decommissioning in Bulgaria, Lithuania and Slovakia is justifiable for historical reasons.

This is in accordance with the recently adopted Waste Directive (OJ L 199, 2.8.2011, p. 48)

6. The closure commitment was then enshrined in the Accession Treaties and ratified by all 27 Member States.

7. While the financial contribution did have the objectives of decommissioning and mitigation measures, they have to be seen in the context of the EU's overall objective in the nuclear field, which is to maximise nuclear safety. This contribution was intended as an expression of solidarity between the EU and the concerned Member States and was not based on a specific proportion of estimated costs.

8. The Accession Treaties provide the framework for the funding scheme. The detailed discussions during the accession negotiations were the basis for the funding scheme put forward by the Commission.

In the particular case of extending support for Bulgaria to the period 2010-2013, the Commission re-examined the justification for such additional financial assistance (SEC(2009)1431 final).

13. The three beneficiary countries contribute with their own financial resources to decommissioning the nuclear power plants as well as to mitigating measures in the energy sector. As such, co-financing has been an established practice since the pre-accession period.

Observations

18. Although recognising that the decommissioning process is not yet complete, the Commission would like to point out a number of major achievements. There have been several years of safe maintenance of the closed reactor units pending complete removal from reactor cores. There has been the complete defuelling of Bohunice reactors 1 and 2 and Kozloduy 1 and 2 and the core of Ignalina 1. Decommissioning strategies were revised and updated in Bulgaria and Slovakia. Bohunice has the basic waste management infrastructure in place and obtained the decommissioning licence for phase 1. In Bulgaria the dry spent fuel storage facility has been built, as well as the design and supply of main equipment for the first phase of decommissioning. In Lithuania some of the major waste storage infrastructure buildings are close to completion and the free-release measurement facility completed. The dismantling has started at all three sites.

19. Certain information having a significant impact on the decommissioning planning will only become available as work progresses. For example, planning for dismantling the reactor core can only be finalised in the decommissioning plan once the reactor has been shut down and a detailed radiological characterisation carried out.

This type of iterative process (also known as a graduated approach in IAEA safety standards) is standard practice in the sector and is recognised as an efficient approach to decommissioning.

20.(a) Given the iterative nature of decommissioning planning outlined above (paragraph 19), the completion of the waste inventories depends on further detailed radiological characterisation. The data available were sufficient for defining the waste infrastructure, taking into account that, in principle, the final disposal of spent fuels and nuclear waste is outside the scope of the programme.

20.(b) Waste management plans exist for all eight reactors. Their detail improves as the radiological characterisation progresses. For example, some activities to dismantle the reactor core can only be performed after defuelling.

The data for Bohunice V1 were of the quality required to obtain the phase 1 nuclear decommissioning licence from the nuclear regulator after first having obtained a positive opinion from the Commission, as required under the Euratom Treaty.

20.(c) Estimating decommissioning costs in detail is an iterative process. Some costs can only be estimated accurately once the corresponding activity has been designed.

20.(d) The EU is currently financing tools and databases for a monitoring system.

Monitoring structures (meetings, reporting) are in place at each of the nuclear power plants.

22. While key projects on the critical path at Ignalina have been delayed, for Bohunice and Kozloduy delays have not yet impacted on the decommissioning completion date.

The final disposal is outside the scope of the decommissioning programme and remains a responsibility of the Member States concerned.

Box 1 - Delays and cost overruns

The plasma melting technology was the market response to the procurement process and was approved by the relevant safety authorities. The project is co-financed from national resources.

Plasma melting technology can potentially serve many more purposes than traditional technologies.

24. The ultimate responsibility for decommissioning and its financing lies with the Member State in which the nuclear power plant is situated. It is not for the EU to make up any funding shortfall. Nevertheless the Commission ensures that such issues are discussed at meetings of the Member States' Management Committee. In addition, it is important to note that the EU has met its financial commitments.

26. The Accession Treaties or subsequent regulations identified the need for mitigating measures. The EU support scheme is designed to ensure that the measures proposed by the Member State are in accordance with and based on their national energy strategies, which inevitably consider the impact of the nuclear plants' closure.

Moreover, for Bulgaria, the Commission is aware that the assessment was outdated and no longer relevant. The EU therefore made its continued financing of mitigating measures for the period 2010-2013 conditional on Bulgaria providing evidence that projects proposed are integral to their national energy strategy and consequential to the closure of Kozloduy.

27. For Kozloduy, the EBRD's assessment indicated that around 500 MW of production capacity would be compensated. In Lithuania, EU support for upgrading a thermal power plant led to an expected capacity compensation of 1045 MW becoming available as replacement capacity, as was foreseen in Protocol 4 to the Accession Treaty.

29. As far as the production capacity is concerned, the Commission considers that 44% will be compensated for Lithuania and 31% for Bulgaria.

The Commission considers that the mitigation measures were prioritised by each of the Member States in accordance with their national energy strategy.

Box 2 - Weak relationship between mitigation activities and reactors' early closure

For Kozloduy, the EBRD's assessment indicated that around 31% of production capacity lost would be compensated.

The Commission considers that there was a strong link between the contribution to the HUDA and the closure of Ignalina nuclear power plant.

Technically the link to the closure is clear: installing 400/110 kV transformers was necessary to relieve the 220kV grid following the Bohunice V1 shut down. This project was 44% co-financed with Slovak resources.

31. The Commission considers that it did ensure the translation of the broad priorities of the Accession Treaties into a coherent set of projects.

The annual Combined Programming Document breaks the broad priorities down into well-defined individual objectives for the use of the EU financial support. Based on a proposal from the beneficiary Member State these objectives are then discussed in the Member States' Management Committee. They then become an integral part of the annual Commission Decision on financing and provide the basis for the elaboration of detailed, individual projects with clearly identified milestones and deliverables.

32. Despite the absence of systems to assess progress against overall programme objectives, monitoring and reporting on programme achievements takes place.

33. Joint reply to 33 and 34.

34. The Commission's 2011 report (COM 2011/ 432) and the accompanying staff working document (SEC 2011/914) provide details of the achievements.

35. The Commission considers that it has always been clear that it has overall responsibility for the EU funds contributing to the programmes.

Nevertheless, the general framework provided by the Accession Treaties has been progressively complemented by a clear procedural framework²⁹ for implementing the EU financial support. This is supported by the EBRD fund rules, the operating agreement between the EC and the CPMA, as well as the annual Contribution Agreements with both implementing bodies. This framework now clearly defines the roles and responsibilities of the involved parties and defines detailed requirements for monitoring and reporting. The Commission will also propose further strengthening this framework in its forthcoming proposals to extend the funds.

The Commission considers that it had sufficient information on which to base its decisions, including information that went beyond formal evaluations and reporting. It has also gone beyond supervision of budgetary execution, considering whether the overall objectives have been achieved.

36. Following the last agreed reactor closure in each country, there is increasing sense of ownership by the Member States concerned.

Progress is measured and resources have been used effectively. There is clear evidence of progress in decommissioning and in mitigating the consequences (achievements were assessed, see also p. 27) of reactor closure.

38. Second indent. It is important to take into account that these personnel costs also covered safe maintenance of the shut down reactor units.

39. For nuclear safety and licensing reasons, the organisational changes, which are the clear responsibility of the nuclear power plant operators and not the primary objective of the EU financing programmes, can only start once the last reactor unit has been shut down. For example, in Lithuania this reorganisation could not start before 2010 and in Slovakia this reorganisation could only become effective once the decommissioning licence had been obtained in July 2011.

CONCLUSIONS AND RECOMMENDATIONS

40. Without the EU financial assistance the three Member States would not have met their closure commitments and refrained from reopening them under sometimes intense political pressure, particularly during the severe gas supply crisis in early 2009.

In addition the assistance provided for major replacement capacity that contributed to the fact that the closure did not result in any electricity blackouts.

²⁹ revised Commission Decision of procedures of 2010 and annual Commission Decision on financing

The Commission considers that the needs still to be met are sufficiently clear given that there are revised decommissioning plans in place for all three sites. In addition, it is also clear that no further support for mitigation measures will be required post 2013 as the replacement capacity will have been put in place, energy efficiency measures implemented and the restructuring of the network successfully completed.

41. Within the framework provided by the Accession Treaties, the policy framework for nuclear decommissioning was intentionally flexible, in order to allow EU support to be adjusted to the Member State beneficiary's needs.

In accordance with the Accession Treaties and subsequent Council Regulations the Commission has put in place a procedural framework that sets specific objectives, defines roles and responsibilities and clearly defines the reporting and supervision requirements. The Commission's supervision focuses on achieving the programme objectives, as well as on budgetary execution and project implementation. It has a clear picture of the achievement of the programmes' objectives and the status of the decommissioning programmes in all three Member States.

In addition, waste flow plans exist and the required radioactive waste processing and storage technologies and facilities are being identified, designed, constructed or have been finished.

42. The ultimate responsibility for decommissioning and its financing lies with the Member State in which the nuclear power plant is situated. It is not for the EU to make up any funding shortfall.

Nevertheless, acknowledging the historical circumstances further EU financial contribution for the period 2014-2020 is currently under discussion in the Council and European Parliament following the Commission's recent Communication 'A budget for Europe 2020).

Recommendation Establish the extent of EU support in a result- oriented way

(a) First indent. A needs assessment will be part of the proposals to extend financial EU support for decommissioning beyond 2013. This takes the form of an impact assessment.

(a) Second indent. The Commission has operated within the legal and procedural framework for an effective, efficient and economic use of EU Funds as described under III(a). It will continue to work within this framework until the end of 2013 but is further developing it for the next multiannual financial framework. The proposal to extend EU financial support for decommissioning beyond 2013 will be accompanied by an Impact Assessment.

The Commission will review its performance indicators so that they can be in place for the period after 2013.

(b) The Commission will implement this recommendation, through its proposals for EU assistance beyond 2013, which will be accompanied by an impact assessment.

ANNEX III

ASSESSMENT OF 16 DECOMMISSIONING PROJECTS

Bohunice Audited project 1. The Commission considers that the decommissioning strategy report has been finalised and will use it as a basis for further detailing waste flows and paths.

Furthermore, the licence holder obtained the decommissioning licence for phase 1 as planned in July 2011. With the decommissioning licence, a new organisational structure became operational. Past weaknesses were related to the transition period.

Bohunice Audited project 2. The Commission considers that this project is a direct consequence of the closure of V1 and, in addition, provides back-up steam and heat for all the Bohunice facilities.

Bohunice Audited project 3. The baskets had been produced to compensate for those previously used for spent fuel removal from Bohunice V1 unit.

Bohunice Audited project 5. The licence holder obtained the decommissioning licence for phase 1 as planned in July 2011. With the decommissioning licence, a new organisational structure became operational. Weaknesses in the past were related to the transition period.

Ignalina Audited project 6. Nuclear safety is ensured by INPP staff that perform safe maintenance. The delay just extends the period of safe maintenance and does not impact upon nuclear safety.

Ignalina Audited project 7. The delays are being addressed.

Ignalina Audited project 8. IIDSF rules require a PMU. As the beneficiary for this project was INPP, the PMU function was assured by the DPMU to avoid creating an additional PMU at Ignalina.

Ignalina Audited project 9. The Commission considers that externalisation was based on the fact that the Ignalina NPP Unit only had limited capabilities to perform the necessary investigations and studies.

Ignalina Audited project 10. The Commission considers that it was important to bring in external expertise for the general project management and procurement as this expertise was lacking amongst the INPP staff.

Ignalina Audited project 12. The Commission considers that separating the design of the landfill from its construction serves to define scope and costs which will be incurred at the (more expensive) second state more closely and thereby gives a sounder basis for entering into a construction contract.

Kozloduy Audited project 13. The Commission considers that it was important to bring in external expertise for the general project management and procurement as this expertise was lacking amongst the KNPP staff.

Regarding the reliability of cost estimates, identification of decommissioning activities, and absence of RAW inventories see Commission replies to paragraph 20.

Kozloduy Audited project 14. The delays can be explained by the need to more than double the capacity of the facility.

Kozloduy Audited project 15. Such a risk needs to be addressed.

Kozloduy Audited project 16. The Commission considers that since units 3 and 4 are in cold shutdown mode, the recent transfer of units 1&2 will provide for such a demarcation.

ANNEX IV

ASSESSMENT OF 6 MITIGATION PROJECTS

Bohunice Audited project 1 The Commission considers that there was a clear link as the project was a direct result of the power imbalance resulting from Bohunice V1 shutdown.

Ignalina Audited project 2. The upgrade of LPP provided replacement capacity. It is the economic context that defines the balance between using the LPP or importing electricity. Reliable production capacity is required if the economic context changes.

Ignalina Audited project 3. The CPMA continues to recognise the importance of converting the 2nd and 3rd housing areas of Visaginas to a closed-type district heating system.

Ignalina Audited project 4. The Commission observes that the termination of the project was decided by national authorities following a change of priorities.

Kozloduy Audited project 5. BEERECL addresses investments in the private sector. In terms of coordination the public authorities (Ministry) is fully involved.

The EBRD has initiated a gradual phasing out of the incentives provided and increased the eligibility criteria for such projects.

Kozloduy Audited project 6. Bulgaria joined the EU in 2007 and hence it was only from then that it had access to the full range of EU funds. At the time of planning and implementation of the project (2004-2005) the situation was very different.