EUROPEAN COMMISSION

Brussels, 13.7.2011
SEC(2011) 914 final

COMMISSION STAFF WORKING PAPER

"Nuclear Decommissioning Assistance Programme data"

{COM(2011) 432 final}

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"Nuclear Decommissioning Assistance Programme data"

Document accompanying the

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

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List of abbreviations

AoC – Assembly of Contributors

BIDSF – Bohunice International Decommissioning Support Fund

CCGT - Combined Cycle Gas Turbine

CDF – Commission Decision on Financing

CDP – Commission Decision on the Procedures

CPD – Combined Programming Document

CPMA – Central Project Management Agency

DAS - Déclaration d'assurance (Statement of assurance)

DG – Directorate General

DP – Decommissioning Programme

EBRD – European Bank for Reconstruction and Development

EC – European Commission

EIA – Environmental Impact Assessment

EU – European Union

FDP – Final Decommissioning Plan

G7 - France, Germany, Italy, Japan, the United Kingdom, the United States, Canada, the European Commission

IDSF – International Decommissioning Support Fund

IIDSF – Ignalina International decommissioning Support Fund

INPP – Ignalina Nuclear Power Plant, Lithuania

ISFS – Interim Spent Fuel Storage

JAVYS – Jadrová a vyraďovacia spoločnosť a.s.

KIDSF - Kozloduy International Decommissioning Support Fund

KNPP – Kozloduy Nuclear Power Plant, Bulgaria

MoE – Ministry of Economy

NDAP - C – Nuclear Decommissioning Assistance Programme Committee

NPP – Nuclear Power Plant

PHARE – Programme of aid to central and east European countries

PMU – Project Management Unit

RAW – Radioactive Waste

RBMK - Reaktor Bolshoy Moschnosti Kanalniy (High Power Channel-type Reactor)

SE – Slovenské Elektrárne a.s.

SEPS – Slovenská elektrizačná prenosová sústava a.s.

SERAW - State Enterprise for Radioactive Waste

UDS - Updated Decommissioning Strategy

VVER - Vodo-Vodyanoi Energetichesky Reactor (Water-Water Energetic Reactor)

V1CDP – V1 Conceptual Decommissioning Plan

V1 NPP – V1 Nuclear Power Plant in Bohunice, Slovakia

1. EXECUTIVE SUMMARY

This document provides an overview of the use of financial resources from the European Union to support the decommissioning of nuclear power plants which were shut-down early under the Acts of Accession[1] in Lithuania, Slovakia and Bulgaria, since 2004. The report summarises the financial status up to 31 December 2009.

The three countries, Lithuania, Slovakia and Bulgaria, operated old soviet design nuclear reactors which the international community, in line with the G7 multilateral programme of action adopted at the Munich G7 summit in 1992, concluded could not be upgraded to meet the minimum required safety standards at an economically acceptable cost. As such these plants required to be closed earlier than their foreseen end-of-lifetime dates.

In the context of the negotiations for accession to the European Union, the three candidate countries took the commitment to close and subsequently decommission these nuclear reactors by a commonly agreed date.

This early closure represented an exceptional financial burden for the Member States which was not commensurate with the economic strength of the countries concerned. In recognition of this fact and as act of solidarity the European Union committed itself to continue to provide adequate additional financial assistance for decommissioning of these reactor units until the end of 2013.

All three Member States have fulfilled their accession treaty commitments to close their reactors in a timely manner. Ignalina Nuclear Power Plant Unit 1 was shut-down on 31 December 2004 and Unit 2 on 31 December 2009. Bohunice V1 Nuclear Power Plant Unit 1 was shut-down on 31 December 2006 and Unit 2 on 31 December 2008. Kozloduy Nuclear Power Plant units 1 and 2 were shut-down on 31 December 2002 and units 3 and 4 on 31 December 2006.

The total financial assistance from the European Union to the three Member States until the end of 2013 foresees €2847.8 million (€1367 million for Lithuania, €613 million for Slovakia and €867,8 million for Bulgaria). By the end of 2009 the European Commission committed a total of €1807 million (€875.5 million for Lithuania, €363.7 million for Slovakia and €567.8 million for Bulgaria).

The European Union assistance is designed to cover a range of measures in support of the decommissioning of the nuclear power plants, such as:

- the assurance of nuclear safety in the nuclear facilities,
- the establishment and upgrade of the waste management infrastructure required to start decommissioning activities,

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[1] Protocol No. 4 on the Ignalina nuclear power plant in Lithuania to the Act of Accession: OJ L236, 23.9.2003, p. 944

Protocol No. 9 on unit 1 and unit 2 of the Bohunice V1 nuclear power plant in Slovakia to the Act of Accession: OJ L236, 23.9.2003, p. 954

Protocol concerning the conditions and arrangements for admission of the Republic of Bulgaria and Romania to the European Union to the Treaty of Accession: OJ L157, 21.6.2005, p.29

- measures to support the nuclear safety authorities in safe assessment and licensing of decommissioning projects

- the environmental upgrading of energy infrastructure and modernisation of conventional energy production capacity as a replacement of the lost nuclear energy production capacity in line with the legislation of the European Union,

- the enhancement of security of supply and energy efficiency,

- measures to support plant personnel in maintaining a high level of operational safety in the periods prior to the closure and during the decommissioning of the reactor units.

The European Union financial assistance has been made available in the form of contributions to three International Decommissioning Support Funds managed by the European Bank for Reconstruction and Development. In addition, since 2004, part of the financial assistance for Lithuania has also been made available as a direct support to the country in order to implement provisions of Art. 2.4[2] of the Accession Protocol through a National Agency (Central Project Management Agency).

The assistance programme has been subject to regular audits and evaluations: mid-term evaluation for Lithuania and Slovakia finalised in 2007, European Commission's internal audits of all three programmes in 2007, audit of the Central Project Management Agency by the European Commission and the European Court of Auditors, audit for the statement of assurance (DAS2008) by the European Court of Auditors, as well as a feasibility study from the European Court of Auditors regarding a full performance audit.

The European Court of Auditors is currently conducting performance audits of all three programmes and at the request of the assembly of donors an external financial audit of the Bohunice International Decommissioning Support Fund is ongoing. These audits and evaluations have proposed a number of possible measures in the frame of improvements to the implementation of the programmes.

In 2006 and 2007 the European Council adopted new Regulations for Lithuania[3] and Slovakia[4] which formed the legal basis for the continuation of the European Union assistance in these countries. Since mid 2010 a new Council Regulation[5] provides the legal basis for additional European Union assistance to Bulgaria for 2010 – 2013.

In 2007 a Member State Management Committee was put in place to assist the European Commission in the implementation of the assistance programmes. As an aid to its administration, the European Commission procedures were modified in 2007 and are since then continuously being improved following the feedback and lessons learned from the programme implementation and in order to take due consideration of the outcome of the different evaluations.

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2 "The Ignalina Programme shall include measures to support plant personnel in maintaining a high level of operational safety at the Ignalina Nuclear Power Plant in the periods prior to the closure and during the decommissioning of the said reactor units."

3 OJ L 411, 30.12.2006, p.10

4 OJ L 131, 23.5.2007, p.1

5 OJ L 189, 22.7.2010, p.9

A Memorandum of Understanding has been signed between the European Commission and the European Bank for Reconstruction and Development and a Joint Steering Committee has been set up with the beneficiary countries to improve the coordination of the programme.

Half way through the current financial perspective (2007 – 2013) significant progress has been made. There are still measures under implementation or preparation, bearing in mind that decommissioning is a long (ca. 30 years) process that extends beyond the current reporting period as well as beyond the current financial perspective.

Despite initial difficulties related to the fact that the closure of the nuclear reactors fell into an economically difficult context and that the Member States were considering to postpone the closure date or even to reopen shut-down reactor units in particular in the context of the gas crisis in early 2009, all concerned nuclear power plants were shut-down as foreseen and safely maintained after their final shut-down.

All beneficiary countries showed high commitment to proceed and where technically possible defueling of the reactor core took place as a first important step towards irreversible closure and decommissioning of the plants. Facilities necessary for decommissioning are under installation. Preparation of licensing documentation is under elaboration and preparatory works for dismantling as integral part of decommissioning are ongoing. The countries` legal framework and management structures were adapted to take into account the change from an electricity producing company to an organisation for safe decommissioning. First dismantling works of non-active facilities have started. Major facilities for the treatment and storage of radioactive waste and spent nuclear fuel are under construction, where required.

The energy sector benefited from the financing of measures fully in line with the European Union energy policy. Energy efficiency projects were successfully completed, conventional production capacities were environmentally upgraded and new capacities are under construction and the adjustment of the electricity grid is under implementation. In none of the three Member States did the closure of the nuclear reactor units result in a black-out of electricity supply. Not even the severe gas crisis in early 2009 led to the reopening, although the intention was expressed at political levels.

With an outlook towards 2013 - the end of the current financial perspective - based on the current achievements, it is a fair assumption that major investment projects will be completed or near to completion and the new decommissioning organisation and management structures will be in place and operational. Dismantling activities and management of decommissioning waste and execution of works by plant staff will have started and will be well on track. It has to be noted that although the last commitment of the European Commission will be made in 2013, the implementation of these works financed from those commitments will extend beyond this date. It can also be considered that, more than four years after the closure of the reactors, the concept of European Union solidarity has effectively mitigated also the economical consequences of the early closure in the energy sector.

2. INTRODUCTION

The present report provides the status of implementation of the financial European Union assistance for the decommissioning of early shut-down nuclear power plants in Lithuania, Slovakia and Bulgaria.

The report covers in particular the implementation of the decommissioning programme during the period 2004 – 2009 however it takes also into account recent progress made in 2010.

The introduction briefly describes the scope and purpose of the decommissioning assistance programme. Chapter 2 describes how the support of the European Union is implemented, how its progress has been evaluated and it highlights the improvements made by the European Commission in administrating the EU financial assistance. Chapter 3 presents details of each of the three Member States programmes, describes progress of their decommissioning situation and highlights the challenges. It also takes into consideration the financial assistance from the preceding period in order to provide a comprehensive picture of the financial assistance provided and for reasons of consistency and accuracy of data (cut-off date for the financial data is the 31 December 2009).

Nuclear decommissioning is the final step in the lifecycle of a nuclear installation and this phase can extend over a period of up to 30 years. It covers all activities from shutdown and removal of fissile material, to the complete environmental restoration of the site. To ensure safe decommissioning of nuclear installations and the related management of waste, it is vital that adequate financial resources are available at the time of decommissioning.

2.1. Purpose and legal basis

At the time of their negotiations concerning the accession to the European Union (EU) the three EU candidate countries, Lithuania, Slovakia and Bulgaria, operated old soviet design nuclear reactors (VVER[6] 440 type 230 and RBMK[7] 1500).

The international community, in line with the G7 multilateral programme of action adopted at the Munich G7[8] summit in 1992, concluded that these reactors could not be economically upgraded to attain the required safety standards. As such, these plants required to be closed earlier than their foreseen end-of-lifetime dates.

This recommendation entered in the accession negotiations and led to fixed closure dates for the three countries concerned.

The EU recognised that shut-down and subsequent decommissioning of these nuclear power plants (NPP) before the end of their designed lifetime represented a significant financial and

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6 Vodo-Vodyanoi Energetichesky Reactor (Water-Water Energetic Reactor)

7 Reaktor Bolshoy Moschnosti Kanalniy (High Power Channel-type Reactor)

8 France, Germany, Italy, Japan, the United Kingdom, the United States, Canada, the European Commission

economical burden for the Member States. In addition it did not allow for sufficient time to accumulate national funds to cover the full costs of decommissioning of the NPPs. For this reason the individual Acts of Accession as well as subsequent Council Regulations for the implementation of these Acts foresee financial assistance to the respective new Member States.

Protocol No. 4[9] on the **Ignalina nuclear power plant in Lithuania** and Protocol No. 9[10] on unit 1 and unit 2 of the **Bohunice V1 nuclear power plant in Slovakia** to the Act of Accession[11] describe the early closure commitments and the EU assistance to Lithuania and Slovakia. Bulgaria committed itself to final early closure of units 1 and 2 of the **Kozloduy nuclear power plant** in an Understanding between the European Commission (EC) and the Bulgarian government. Article 30 of the Protocol concerning the conditions and arrangements for admission of the Republic of Bulgaria and Romania to the European Union[12] to the Treaty of Accession[13] describes the commitment of Bulgaria to close early units 3 and 4 of the same power plant and the EU assistance.

2.2. Scope

The assistance is designed to support the effort of the Member States in the decommissioning of their old soviet-type NPP units as well as the issues related to the social consequences of the early closure and decommissioning of these NPPs and to support the energy sector in order to mitigate lost generating capacity:

Decommissioning: covers the assistance in the period of preparatory works for shut-down, support to the regulator and elaboration of documentation necessary for decommissioning and licensing. In the period after shut-down it addresses the issues of safe maintenance and surveillance, waste treatment, waste and spent fuel storage and decontamination and dismantling works.

Energy: covers measures such as modernisation and environmental upgrading of existing facilities, replacement of the production capacity of shut-down units, improving security of energy supply and energy efficiency and other measures consequential to the decision to close and decommission these plants and which contribute to the necessary restructuring and upgrading of the energy infrastructure.

Social consequences: covers support to the plant personnel in maintaining a high level of safety in the periods prior to dismantling after closure and re-training of the staff affected by the shut-down of the units for the new tasks in decommissioning.

2.3. Scheduling

The EU assistance has been provided over three main periods in accordance with a series of legal bases.

For Lithuania and Slovakia the periods can be identified as pre-accession up to 2004, 2004-2006 and 2007-2013:

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9 OJ L236, 23.9.2003, p. 944
10 OJ L236, 23.9.2003, p. 954
11 OJ L236, 23.9.2003, p. 33
12 OJ L157, 21.6.2005, p.29
13 OJ L157, 21.6.2005, p.203

In the pre-accession period assistance was provided to Lithuania and Slovakia through the PHARE[14] programme, between 2004-2006 assistance was provided under the Protocols to the Act of Accession and since 2007, Council Regulations for Lithuania[15] and Slovakia[16] ensure that the assistance continues for the period 2007-2013.

EU assistance periods for Bulgaria can be defined as pre-accession until 2007, 2007-2009 and 2010-2013:

In the pre-accession period up to 2007, the EU had already contributed to the decommissioning of the Kozloduy NPP (KNPP) through the PHARE programme. Further assistance for the period 2007-2009 was provided under the Protocol to the Treaty of Accession based upon the deferred decommissioning strategy chosen at the time in Bulgaria. In 2009 Bulgaria formally requested a prolongation of the funding assistance in order to proceed with a revised immediate decommissioning strategy. The recently adopted Council Regulation[17] ensures that the assistance continues for the period 2010-2013.

2.4. Amounts

The assistance provided recognises the extraordinary burden placed on the new Member States by the early shut-down commitment. The assistance is not aimed to cover the full cost of decommissioning or to compensate for all economical consequences but represents an expression of solidarity between the EU and the Member States. The different amounts committed to individual Member States represent the outcome of political negotiations and take into account diverse social and economic aspects of the countries and different types and number of units to be dismantled.

Overview table of the financial assistance to the Member States from 1999 to 2013 (€ million) ***as anchored in the basic legal acts****:*

	1999-2003	**2004-2006**	**2007-2013**	**Total**
Lithuania	210	285	837	1332
Slovakia	90	90	423	603
Bulgaria	155	185	510	850
Subtotal	455	560	1770	2785

**Actual yearly commitments are adjusted for inflation.*

By the end of 2009 the actual committed amounts to the three countries were: €875,5 million for Lithuania, €363,7 million for Slovakia and €567,8 million for Bulgaria.

[14] Programme of aid to central and east European countries
[15] OJ L 411, 30.12.2006, p.10
[16] OJ L 131, 23.5.2007, p.1
[17] OJ L 189, 22.7.2010, p.9

3. PROGRAMME ADMINISTRATION

The pre-accession EU financial assistance to the three countries was launched in 1999 and was administered by Directorate General (DG) Enlargement. With accession (2004 for Lithuania and Slovakia and 2007 for Bulgaria) the programme has been transferred to DG Energy (formerly DG Transport and Energy).

The assistance is provided by means of three separate, but related programmes. For all three countries assistance is provided through the mechanism of multi-donor **International Decommissioning Support Funds (IDSF)** administered by the European Bank for Reconstruction and Development (EBRD).

In Lithuania, an additional **nationally managed implementation channel** has been set up in 2004 in order to implement provisions of Art. 2.4[18] of the Accession Protocol of Lithuania, during the period 2004-2006. As such, part of the EU assistance was provided directly to Lithuania as Member State and implemented by the "Extended decentralised implementation system" accredited Central Project Management Agency (CPMA). Since 2007, under the current financial perspective, the direct assistance continued to be implemented by the CPMA as the appointed National Agency under centralised indirect management.

3.1. Programme Evaluations

The assistance programme has been subject to a number of audits and evaluations. These have led to improvement measures to the implementation mechanism.

A "Mid-term evaluation of the decommissioning assistance to Lithuania and Slovakia provided under the protocols to the Treaty of Accession"[19] was finalised in 2007. It reviewed the programme and evaluated the progress in the implementation of the projects. The findings and recommendations of the mid-term evaluation were taken into account in the preparation of the new procedures related to the programming and monitoring of the decommissioning assistance programme under the 2007 – 2013 financial perspective (see next section below).

The EC internal audits of all three programmes in 2007 had the objective to audit the structures and procedures put in place to ensure the operational and financial management of the assistance and to formulate an opinion as to their adequacy, their effectiveness and efficiency. In addition the financial transactions resulting from the management were audited for their legality and regularity.

CPMA was audited by the EC and the European Court of Auditors in 2008 and 2009 with the objective of ensuring that the CPMA still fulfils the accreditation requirements for the implementation of centralised indirect management in the context of the decommissioning activities of the Ignalina Nuclear Power Plant (INPP).

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18 "The Ignalina Programme shall include measures to support plant personnel in maintaining a high level of operational safety at the Ignalina Nuclear Power Plant in the periods prior to the closure and during the decommissioning of the said reactor units."

19 http://ec.europa.eu/energy/nuclear/decommissioning/doc/01_evaluation_decommissioning_final_report_250907.pdf

The European Court of Auditors conducted an audit in the context of the preparation of the statement of assurance[20] in 2008 (DAS2008). Following DAS2008, the EC initiated an external financial audit of the Bohunice International Decommissioning Support Fund.

Following a feasibility study in 2009 by the European Court of Auditors, the Court decided to conduct a full performance audit of all three decommissioning programmes (ongoing).

The recommendations from the above mentioned evaluations or audits to improve the assistance programme have been thoroughly assessed and are being continuously implemented in adjusting the procedural framework accordingly.

3.2. Procedural Framework

Stemming from the preparation of the new legal base (since 2007) and following evaluation and lessons learnt from the first years` implementation of the programme a new procedural framework was put in place in 2007.

The mechanism for implementing the financial assistance in 2007-2013 is laid down in the Commission Decision on the Procedures[21] (CDP). The decision defines the roles and responsibilities of the involved parties as well as the procedures for programming and monitoring of all three decommissioning assistance programmes independent of the chosen implementation channel.

The first stage of implementation is the development of an annual programming document – Combined Programming Document (CPD). This document is prepared by the Member State concerned who is responsible at national level for the implementation of the programme. The CPD outlines the proposed use of funding and establishes a list of key objectives under which projects may be raised. The CPD is updated annually and addresses all relevant aspects of the programme.

The funds are committed to the programmes by the EC on an annual basis by adopting every year a Commission Decision on Financing (CDF). The above mentioned CPD becomes an integral part of the CDF upon its adoption by the Commission.

The legal base requires the EC to establish a Management Committee (the Nuclear Decommissioning Assistance Programme Committee (NDAP-C)) composed of nominated representatives of all EU Member States and chaired by the representative of the EC. The role of NDAP-C is to assist the EC and to approve the procedural and financing decisions (including the CPDs) as well as the individual projects to be financed under the EU assistance.

The EC disburses payments (transfer of money from the EC to the EBRD and CPMA) upon the request of the implementing bodies based on the progress of project implementation.

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[20] Article 248/1 of the Treaty establishing the European Community: The Court of Auditors shall provide the European Parliament and the Council with a statement of assurance as to the reliability of the accounts and the legality and regularity of the underlying transactions which shall be published in the Official Journal of the European Union. This statement may be supplemented by specific assessments for each major area of Community activity.

[21] Commission Decision on the procedures related to the programming and monitoring of the measures and financial assistance under the Bohunice and Ignalina programmes for the period 2007 to 2013 and under Kozloduy programme for the period 2007-2009 – C(2007)5538

The implementation of measures and financial assistance is monitored by the respective monitoring committee under each implementation channel. For specific projects, co-funding ceilings have been provided in the EBRD's Assembly of Contributors' approval (e.g. in Lithuania the CCGT project where the IIDSF finances the lower of 70% or €165 million - all cost overruns are thus borne by Lithuania).

The procedural framework is improving since 2007 and DG Energy is continuously integrating lessons learnt and feedback from implementation. Therefore following the recent adoption of the Council Regulation for the extension of assistance to Bulgaria beyond 2009, the CDP has been revised[22].

3.3. Implementing channels

The legal base leaves a possibility for alternative implementation channels for the assistance to be implemented. Assistance is currently provided via two channels: contributions to the respective IDSF of the EBRD and through a nationally managed implementation channel – National Agency, in line with Council Regulation 1605/2002 on the Financial Regulation applicable to the budget of the European Communities[23].

The choice of implementation channel is essentially a choice made by the beneficiary Member State, described in the CPD and approved by the EC upon fulfilment of required criteria. Today only Lithuania has implemented this direct national support channel.

3.3.1. International Decommissioning Support Funds

There exists one fund for each of the three Member States:

- Ignalina International Decommissioning Support Fund (IIDSF)
- Bohunice International Decommissioning Support Fund (BIDSF)
- Kozloduy International Decommissioning Support Fund (KIDSF).

The IDSFs were established in 2000 and are managed by the EBRD in London in accordance with the EBRD`s rules and procedures as well as the individual Fund Rules. They are multi-donor funds where contributing countries along with the EC (the largest and since 2004 the sole contributor) gather their contributions. This IDSF implementing mechanism has been put in place prior to the accession of the three countries to the EU, at a time when the multi-donor Fund was considered to be the appropriate instrument. Today, all three countries are Member States of the EU; however the implementing mechanism has not yet changed.

The tasks of the EBRD include managing the public funds allocated to the programmes for decommissioning and monitoring the financial management of these programmes so as to optimise the use of public money. In addition, the EBRD carries out the budget tasks entrusted to it by the Commission in line with the requirements of the Financial Regulation.

The governing body overseeing all three funds is the Assembly of Contributors (AoC) chaired by the representative of the EC. The AoC meets twice a year and takes the final decision on

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22 Commission Decision on the Procedures C(2010)6885 final

23 OJ L 248, 16.09.2002, p.1

the eligibility of projects financed with the resources of the funds. It supervises the implementation performed by the EBRD, approves the 6 monthly work programmes and draft Grant Agreements presented by the EBRD.

The EBRD enters into Grant Agreements for each project or set of projects with recipient organisations. It is the recipient who is responsible for all contracting matters with the suppliers, while EBRD pays directly to the contractor after verified completion of the projects.

The lifetime of the funds as stated in the latest version of Fund Rules is 31 December 2016. The AoC may take a decision to extend this lifetimes based upon the presentation of a justified case.

The EC – EBRD relationship

In order to improve the cooperation between the EC as the main donor and the only contributor to IDSFs since 2004 and the EBRD as funds manager, in 2007 the two parties signed a Memorandum of Understanding[24] together with a set of Implementing Rules[25]. The Implementing Rules set out how the cooperation between the EC and the EBRD should be organized and define the channels of communication and exchange of information between the two for all issues related to activities of IDSFs.

A flow of technical and financial information related to IDSFs` activities is maintained between the EC and the EBRD at the working level. A Joint Steering Committee composed of representatives of the EC, the respective recipient country, and the EBRD has been created for each of the funds. This Committee assists in ensuring the complementarities of activities financed from the respective fund with those financed within national programmes and through bilateral EC assistance.

An AoC pre-meeting is held between EBRD and EC prior to each AoC meeting to prepare the detailed technical issues, answer outstanding questions, as well as the main documents coming up at the meeting. This information is afterwards distributed to the NDAP-C that is asked to deliver its opinion.

The EC contributions to the Funds

The EC contributions to the IDSFs, based on annual CDF, are **committed** by means of individual annual Contribution Agreements concluded between the EC and the EBRD. At this stage however, no money is actually transferred to the EBRD.

Individual contributions to any of the funds are not identified for specific projects and as such it is not possible to distinguish which project was paid from which contribution.

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[24] Memorandum of Understanding between the European Commission and the European Bank for Reconstruction and Development in respect of reinforcing cooperation in the field of energy; signed on 13 July 2007 in Brussels

[25] Implementing rules for co-operation between the European Commission and the EBRD in the field of nuclear decommissioning in the context of the International Decommissioning Support Funds for Ignalina, Bohunice and Kozloduy; signed on 10 December 2007 in London

Actual payments to the IDSFs, governed by Contribution Agreements are **disbursed** (transfer of money from the EC to the EBRD) on the basis of regular procurement forecasts, normally presented every 6 months.

Payment requests can be made for projects where the contract signature is expected within the forecasted period and for which the Grant Agreements have already been approved. The disbursement decision is taken by the EC following a financial and technical review of the submitted documentation. The payments from the EC to the IDSFs can be effected as long as the IDSFs remain in force.

3.3.2. National Agency

Protocol No. 4 on INPP in Lithuania provides for alternative implementation routes via which the assistance can be delivered directly to Lithuania through a national administration body. In Lithuania appropriate national implementation structures are in place for the implementation of measures through a national agency in accordance with Articles 53(a) and 54(2)(c) of the Financial Regulation.

During the period of 2004-2006, the direct assistance to Lithuania was provided via the Programmed Instrument mechanism. This is a PHARE-type approach aimed at addressing safety culture, safe maintenance and social-related issues, as well as those decommissioning projects which for reasons of practical expediency could be better managed by the Lithuanian authorities.

Under the current financial perspective, the EC designated[26] in 2007 the CPMA as the national agency for the assistance programme under "centralized indirect management", so replacing "decentralized management" based PHARE and Programmed Instrument systems.

The key feature of the functioning of the national channel is its clear distinction between programming and financing. The Ministry of Energy (earlier the Ministry of Economy (MoE)), is responsible for programme and project development and coordination, while the Ministry of Finance is responsible for financial control.

The CPMA is the contracting authority and ensures the implementation of investments and management of project preparation, selection, appraisal, procurement, contracting and control in full accordance with EU legislation and national Lithuanian law.

The EC – CPMA relationship

The cooperation between the EC and CPMA is governed by an Operating agreement[27] setting out the practical implementation arrangements of the programme. In addition to the operating agreement a set of guidelines exists that clearly defines a consistent and pragmatic programme monitoring and reporting system, providing detailed information on project progress, costs and time schedules.

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[26] Letter dated 4 June 2007 from the EC to Lithuania: Nomination of the National Agency for the Ignalina Programme

[27] Commission – National Agency Operating Agreement for the implementation of the 2007-2013 Ignalina Programme, signed 21 December 2007

CPMA signs contracts with beneficiaries upon validation of the project identification fiches by the EC. These fiches are prepared by the beneficiary and submitted via the CPMA to the EC. Upon consultation of the NDAP-C the Commission provides its approval of or comments to the fiches.

A Monitoring Committee reviews every six months the progress made towards meeting the objectives of the programme as set out in the CPD and approves the draft monitoring reports provided by the CPMA. The meetings are chaired jointly by the EC and national programme coordinator.

The EC contributions to the national channel

The EC contributions, based on an annual CDF, are **committed** by means of individual annual Contribution Agreements concluded between the EC and the CPMA.

The Commission executes **payments** (disbursements) at the request of the CPMA, following approved project identification fiches in accordance with the provisions of the Contribution Agreements. Funds are transferred from the EC to the Ministry of Finance and from there to the CPMA. A State guarantee is in place over the full value of the programme.

4. COUNTRY REPORTS

Nuclear decommissioning is the final step in the lifecycle of a nuclear installation extending over a period of ca. 30 years. It covers all activities from shutdown and removal of fissile material to the environmental restoration of the site.

The decommissioning process can be considered in phases, such as pre-decommissioning or operation termination period where preparatory works are executed and decommissioning itself.

The pre-decommissioning period comprises all activities necessary for plant operation termination and preparatory activities for decommissioning. During this period, systems necessary after shutdown of the reactor units are modified, decommissioning documentation in order to obtain the decommissioning license is elaborated, all fuel is transported to the interim spent fuel storage (ISFS), operational radioactive waste (RAW) is processed, characterisation of RAW takes place and decommissioning preparation activities start.

In some Member States, some of the facilities necessary for the decommissioning were already in place, in some Member States they had to be constructed and installed or refurbished in the operation termination period. Amongst others, these include ISFS where the fuel is transferred to, RAW treatment facilities, interim storages and repository for RAW.

The principal step in preparation of the decommissioning is elaboration of the decommissioning documentation. It provides general technical and financial information on possible and reasonable decommissioning options and demonstrates that the future decommissioning process will be technically feasible and, most importantly, suitable in compliance with provisions under the Euratom Treaty and national law for health protection, nuclear safety, physical and environmental protection.

Early shutdown of the respective NPPs had an impact on the security of energy supply. Therefore it has been agreed to cover measures to mitigate impacts on the energy sector.

These measures were derived from the national strategic energy plans in line with the EU energy policy.

To ensure safe and reliable electricity supply, modifications and refurbishment of the electricity grid were needed. Where deemed necessary, the plans to assist in replacement capacity were executed - either via new and refurbished generating capacities, or via projects to support the energy efficiency in the Member States.

The scope and nature of the projects realised in the three Member States are different as to the different boundary conditions in these countries – national policies, state of the existing facilities and networks and needs in the energy sector.

Although the assistance aims to cover measures in three principal windows - Decommissioning, Energy and Social consequences, it is the Member States that propose how to use and distribute the funds available, based on its needs and assessments.

The assistance started before the time of accession and well before the time of shut-down. The funds were made available on the annual basis at the times when Member States were not yet able to make full use of them, therefore they accumulated within the IDSFs while administrative preparations continued. The accumulated funds have started to be better utilised in recent years and will likely be absorbed over the next two years.

The assistance is not aimed to cover the full cost of decommissioning or to compensate for all economical consequences but represents an expression of solidarity between the EU and these Member States. Therefore the legal base allows for certain flexibility in the use of the funds. The constructions of ISFSs or national waste repositories as well as some other RAW management projects are, strictly speaking, not part of the decommissioning. However due to historical reasons, some Member States were not in a position to make those facilities available in due time. Therefore, in order to allow starting the process and to progress with the decommissioning of the early closed NPPs, those waste management projects were supported through the EU assistance programme. This should be considered as a kind of 'upfront' support to the Member States that must be duly taken into account in the case of discussions on potential further EU support.

In the following sections, each individual country report contains a general part describing the closure commitment and evolution of funding, part on decommissioning and waste management describing the situation and projects in this area and an energy chapter discussing the situation and projects in the energy sector. The part on performance of the programmes deals with the financial and technical performance of the programmes.

A detailed report on all projects undertaken since 1999 is beyond the scope of this report. It is nevertheless beneficial to highlight a few of the key projects undertaken in order to lend insight to the overall technical progress of the decommissioning programmes. A full list of projects covered by the programmes will be found in the Annex.

4.1. Lithuania – Ignalina Nuclear Power Plant

4.1.1. Closure commitment and evolution of funding

Introduction

Lithuania had operated two RBMK-1500 nuclear reactors which were commissioned in 1983 and in 1987 respectively. The units are owned by INPP, a state owned enterprise under the responsibility of the Lithuanian Ministry of Economy and since 2009 under the newly created Ministry of Energy. This corporate entity was responsible for operation and is today responsible for safe maintenance of the plant as well as for the development and implementation of the decommissioning programme for the two reactor units.

In the context of its accession to the EU, Lithuania committed itself to the closure of both units. Unit 1 was permanently shut-down on 31 December 2004, and unit 2 on 31 December 2009.

Funding

In the period 1999-2003 pre-accession financial assistance of €210 million was made available to Lithuania as an EU contribution to the IIDSF, managed by the EBRD.

In recognition of Lithuania's closure commitment, to support Lithuania's immediate decommissioning strategy and to address the economic consequences of the early closure of the two INPP units, the EU took the decision to extend its financial assistance beyond 2003. In the period 2004-2006 Lithuania's accession Protocol No. 4 foresaw the provision of €285 million of funding assistance (€320 million after adjustments for inflation). This assistance was implemented via two routes; through the IIDSF managed by the EBRD and through annual Programmed Instrument decisions managed by the CPMA. The Protocol No.4 already foresaw further continuation of financial support.

Consequently further assistance has been provided in the period 2007-2013. The Council Regulation on the implementation of Protocol No. 4 to the Act of Accession foresaw the provision of an additional €837 million of decommissioning support, this again being implemented via the EBRD and via CPMA.

The projects implemented via the IIDSF are typically large infrastructural projects, such as the Interim Dry Spent Fuel Storage Facility B1 and the Waste treatment and storage facility projects B2 and B34 and energy projects. By contrast the projects implemented via the National Agency are typically related to the safe maintenance of the reactor units in shut-down condition as well as the actual implementation of decommissioning projects.

As the programme has evolved, the infrastructural projects implemented by the IIDSF are gradually nearing completion, with an increasing focus on actual dismantling projects leading to a natural increase in the proportion of the annual budget being implemented through the CPMA.

The following tables provide an overview of the financial support to Lithuania and specific information on the different implementing channels EBRD and CPMA. Up to 2009 the provided figures represent the real commitments in accordance with the annual EC's financing decisions. The total financial assistance to Lithuania between 1999 and 2013 is foreseen to be €1367[28] million. As of 31.12.2009 a total of €875,5 million were committed out of which € 760,4 million had been disbursed.

*Summary of EU **commitments** to Lithuania (€ million): situation as of 31.12.2009*

[28] The amount is the sum of: real commitments until the end of 2009 + forecast for 2010-2013

	Total foreseen 1999-2013	Before 2004	2004	2005	2006	2007	2008	2009	Total committed
IIDSF		206,5	95	88	90	76,2	52,2	36	643,9
National Agency		3,5	10	18	19	36,8	61,8	82,5	231,6
Total	1367	210	105	106	109	113	114	118,5	875,5

*Summary of EU **commitments**, **allocations** and **disbursements to the IIDSF*** *(€ million)*: *situation as of 31.12.2009*

	Total
Total committed to IIDSF (EU and other donors)	723,1
EU committed to IIDSF	643,9
IIDSF allocated to projects	697,8
Decommissioning and Waste	409,4
Energy	288,4
Disbursed – EU to IIDSF	592,6

*Summary of EU **commitments**, **allocations** and **disbursements to the CPMA*** *(€ million)*: *situation as of 31.12.2009*

	PI***	2007-2009	Total
EU committed to CPMA **	50,5	181,1	231,6
CPMA allocated to projects	49,8	134	183,8
Decommissioning and Waste	42,9	99,0	141,9
Energy	7,0	35,0	42,0
Disbursed – EU to CPMA	49,8	120,9	170,7

** For commitment and disbursement procedures see chapter 3.3.1. and 3.3.2*

*** The EU is the only contributor to CPMA*

**** Programmed Instrument*

4.1.2. Decommissioning and Waste window

Organisational issues

From 1999 the responsibility for the Ignalina decommissioning programme was attributed to the Lithuanian government and specifically its MoE.

In April 2000 the MoE established a specific **Decommissioning Service** within the INPP organisational structure, with full responsibility for INPP decommissioning. This service was supported by dedicated expert consultancy services to assist in the establishment of decommissioning planning, and engineering and project management services to the Decommissioning Service.

Pursuant to the Law on Radioactive Waste Management of 1999, the Minister of Economy approved on 16 May 2001 the "Articles of Association of the State Enterprise Agency of Radioactive Waste Management". The principle aim of the Agency is the management and disposal of all RAW transferred to it, assuring nuclear and radiation safety.

The **strategic planning** activities associated with the closure and decommissioning of INPP are subject to Parliamentary, Governmental, Ministerial and regulatory approval.

In the first instance the Lithuanian Law on Nuclear Energy requires the adoption of specific laws to cover the process of decommissioning for each nuclear facility. The Law on the Decommissioning of unit 1 of INPP was duly adopted on 2 May 2000. For the case of INPP unit 2, a single new law will be adopted covering the decommissioning process of both units. This new law is currently under preparation.

In addition, the regulatory framework applicable to decommissioning requires the preparation of a governmentally approved **Decommissioning Programme** (DP) and a magisterially approved **Final Decommissioning Plan** (FDP).

The **DP** lays down legal, organisational, financial and technical measures for

- the final shut-down of units 1 and 2,
- the termination of the operation of the equipment, dismantling, conservation, RAW management and disposal,
- the mitigation of negative economic and social consequences relating to the early closure of INPP and dismissal of employees.

The DP for the period 2005-2010 was adopted on 2 February 2005. An updated version is currently under preparation.

The **FDP** is a more technical orientated document which details:

- the strategy for facility dismantling;
- an estimate of the decommissioning costs and schedule;
- an outline of the decommissioning methods and techniques;
- a quantification of waste produced by the decommissioning;
- a conceptual assessment of decommissioning safety and environmental impact assessment (EIA) programme;
- Plans for preparatory works, stages and facility designs.

The FDP was adopted on 4 July 2005; an amended version of the FDP is foreseen for end-2010 and will present revisions to the personnel requirements, decommissioning costs and the schedules for the project.

The preparation of the detailed plans for the decommissioning activities occurs in two steps which are both subject to regulatory approval:

- The preparation of specific Decommissioning Projects based on the FDP and subject to granting of the necessary licenses or authorisation.

- The preparation of the detailed procedures required for the execution of the decommissioning activities outlined in the Decommissioning Project.

The practical implementation of the overall DP and the allocation of funding for this purpose is then transposed into an annual Measures Implementation Plan subject to Ministerial approval. The Ministry intends to prepare a revised Measures Implementation Plan in 2010.

In 2009 a new government was elected in Lithuania. Recognising the strategic importance of the energy topic this government created a new Ministry of Energy with full responsibility for the Ignalina decommissioning programme. This transfer has been characterized by a significant increase of level of involvement in, and ownership of, the decommissioning project.

After closure of both units, second in the end of 2009, in February 2010 significant changes to the management structure of INPP were implemented. This action reflected the change in role of INPP from an electricity generator to a decommissioning organisation.

Key actions have been

- Recruitment of new external personnel to key organisational posts with specific industrial and commercial experience in order to accelerate the change in culture at INPP

- Reanalysis of the existing capabilities with a view to internalise key additional decommissioning projects rather than having them performed by external contractors. This aims to develop the corporate knowledge in decommissioning as a key strategic asset, to encourage the retention of key personnel by convincing them that there is a long term future at INPP, and also but not least to reduce costs.

Technical Issues

At the start of the project, the absence of existing waste repositories in Lithuania represented a critical obstacle to the decommissioning and dismantlement of the Ignalina reactor units. To address this issue a series of projects were identified to provide an ISFS facility, a solid waste management and storage facility, near surface repositories, a landfill facility and its associated buffer stores and a free release facility.

Closure also held significant consequences for the heat and power provision to the local town of Visaginas. Priority was therefore given to the provision of replacement heat and steam boilers and a renewal of the district heating systems.

Today both reactor units at INPP are permanently shut-down. These actions conform to the requirements of the Accession treaty. Unit 1 is in the Reactor Final Shutdown stage as

approved by the State Nuclear Power Safety Inspectorate while the necessary documentation to achieve this status for unit 2 is under preparation.

Unit 1 reactor defueling is completed, with some fuel assemblies remaining in the reactor storage pools. In the period between the closure of unit 1 and unit 2, a number of partially burnt-up fuel assemblies were transported from unit 1 to unit 2 for reuse. This action negated the need for procurement of additional fresh fuel for unit 2, and reduced significantly the overall number of spent fuel inventory requiring ISFS.

At this time the unit 2 reactor core remains fully loaded, such that essential reactor systems must be maintained in an operational condition. Defueling of the unit 1 and 2 pools and the reactor core will recommence upon completion of the new ISFS facility which is foreseen to be commissioned in early 2011.

In their current state both reactors require to be maintained in a safe condition. It has been the Lithuanian strategy to utilise, as far as possible existing staff, to perform the dismantling and decommissioning works and eventually to operate the waste repositories. Such a strategy helps to ensure continuity in safety standards at the plant, while being highly cost effective compared to employing external contractors. In addition it reduces the social impact of INPP closure on the region.

A selection of the key projects that were funded by the EU support is listed below (a full list of projects undertaken under the programme will be found in the Annex)**:**

- **Safe maintenance of unit 1 and 2:** Financial support has been dedicated to the plant personnel to safely maintain both reactor units after their final shut-down. Existing staff are currently also supported to perform preparatory as well as dismantling works.

- **VATESI support:** The Lithuanian nuclear regulator – VATESI - holds a key position in the authorisation and licensing process. Support to VATESI has been an ongoing action since 2001. This project provides specialist western European technical support to review decommissioning related documentation in order to accelerate the licensing and approval processes.

- **Provision of Consultant support to INPP:** On-site project management and engineering consultancy support to the IIDSF projects has been provided to INPP since 2001. This support has led to the development of the FDP, the development, procurement and supervision of the major decommissioning support projects as well as the training of INPP personnel.

- **Interim spent fuel store (B1):** Prior to the closure of unit 2 the existing INPP ISFS at INPP was almost fully occupied. A priority project was therefore implemented for the construction of the new ISFS to allow the fuel to be removed from the Unit 1 and 2 cores. The B1 project included also the design and manufacturing of storage casks for spent nuclear RBMK fuel elements. The B1 project has encountered several problems during the preparatory phase that have led to a significant delay of 4 years and an increase in costs (initial budget foreseen: € 171 million; current budget € 193 million):

    – Inaccurate fuel characterization data relevant for the design of the spent fuel casks;

– The protracted licensing approval processes in Lithuania for the technical design and safety case,

– Difficulties with the main contractor of which the owner was changed several times;

– Insufficient commitment and deficiencies in project management on both, the contractor and owner side, in the early phase of the project.

Today, both sides are committed to the project and the construction is progressing well. The facility is currently foreseen to be commissioned in mid 2011.

- **Solid waste management and storage facility (B234):** The project for the design and construction of a new Solid Waste Management and Storage Facility for the management of short and long-lived low and intermediate level RAW. This project, involving the same contractor, is also delayed for several reasons:

  – Both parties entered into the contractual arrangement, although changes in contract scope and technical requirements were already known by both parties before contract signature.

  – Contractor submissions of technical design and safety case was late and to an unacceptable quality from the owners point of view.

  – Contractor under-assessment of technical approval procedures in LT

  – Protracted national approval system, involving numerous different parties.

  – Delay in settlement of contractual disputes; Project Management Unit (PMU) requested by EBRD fund rules to support INPP on commercial level was not proactively involved.

The project has entered into a commercial dispute between the owner and the contractor. A settlement of the commercial dispute is currently under discussion

On the technical level, a complete reassessment of the project timeline is currently being undertaken and discussed between the contracting parties.

- **Free release measurement facility:** The new Free Release Measurement Facility has been completed and is undergoing its final acceptance trials.

- **Detailed decommissioning plans for specific building:** The engineering planning for the phased dismantling of contaminated and activated systems and buildings is ongoing. These projects aim at establishing a benchmark for the safe and cost-effective decommissioning of NPPs with RBMK reactors. The dismantling work on the Emergency Core Cooling Building will commence in 2010 and will be performed by the staff of INPP. The necessary tools have already been procured. There are delays with this project which can be attributed to the contractors underestimation of the effort required to obtain licensing approval.

- **Preparation of a decommissioning database and planning tool:** Detailed planning will make use of the now operable Decommissioning Database & Management System. In

addition a detailed workforce accounting system is being developed. The progress towards full decommissioning and the full estimated and actual costs of decommissioning are monitored via this system.

- **Primary circuit decontamination:** The projects for the decontamination of the main circuit of unit 1 and construction of the new Decommissioning Training Centre, are now underway.

- **Landfill Facility and Buffer storage:** The project for the Landfill Facility is progressing well and the contract for the design of the Near Surface Repository for low and intermediate level short lived RAW has recently been awarded.

- **Radiological characterisation:** Radiological characterization of the plant facilities is a key issue to prepare for safe and efficient dismantling. The characterisation programme is well progressing and will be finalised by the plant's own staff.

4.1.3. Energy window

Lithuania experiences significant risk and uncertainty with respect to energy supply as a function of the isolated nature from EU electricity grid of the Baltic electricity network. The closure of INPP units 1 and 2, only exasperates this high dependence upon Russian gas, oil and electricity imports.

In a bid to mitigate these risks Lithuania has established a National Energy Strategy, which addresses the issues, energy efficiency, energy security of supply, environmental issues, and energy management improvements.

The energy chapter of the Ignalina programme links to this strategy by addressing some critical issues with a view to minimising the energy supply risks during the period between the closure of INPP unit 2 and the proposed construction of alternative power generation capacity.

Within this context a number of key energy sector projects have been supported (a full list of projects undertaken under the programme is to be found in the Annex)**:**

- **Upgrade of Lithuanian thermal power plant:** A project was instigated to improve the efficiency and reduce particulate emissions in line with the environmental legislative framework of the EU, at the existing Lithuanian thermal power plant. This action was necessary to allow the thermal power plant to operate over the coming years within the environmental constraints, and therefore be able to provide efficient replacement capacity after closure of INPP.

- **Compensatory shunt reactor:** A consequence of the closure of the generating capacity at INPP there was a need to establish a balancing resistance to the now redundant arm of the electricity distribution network. This was achieved through the construction of a shunt reactor station.

- **Replacement of gas-fired boilers for Visaginas town:** Prior to INPP closure Visaginas town, obtained its heat and hot water via the waste heat from Unit 2 via an open-loop system. Closure of INPP necessitated the construction of replacement gas-fired boilers to provide heating to the town. These have been completed under an IIDSF funded project.

- **Upgrade of district heating systems of Visaginas:** Linked to the boiler replacements was the upgrade of the district heating system of Visaginas to ensure reliable and efficient heat supply.

- **Heat only boiler station:** For the continued reliable steam and heat supply to INPP (and nearby city Visaginas), new gas-fired steam and heat boiler stations have been constructed and the related pipe work modernised; the transformation of the entire district heating to a modern closed-type system is ongoing.

- **CCGT**: EU funds have been made available to the IIDSF for co financing (€ 165 million out of € 329.4 million) of the construction of a 400MW Combined Cycle Gas Turbine (CCGT). The CCGT will replace two existing inefficient 150MW thermal units at the Lithuanian thermal power plant.

- **Energy efficiency upgrading of multi-apartment residential buildings**: In the energy efficiency sector, the co-financing of the energy efficiency upgrading of multi-apartment residential buildings has been provided. The project is implemented through an effective pre-existing mechanism in Lithuania administered through the Housing & Urban Development Agency.

- **Energy efficiency upgrading of public buildings:** Energy efficiency upgrading projects have also been instigated in schools, hospitals and other publicly-owned buildings providing services to the general public in the INPP region.

- **Construction of the interconnection between the Polish and Lithuanian power systems (LitPol Link):** Preliminary planning actions associated with such a cross-border interconnection and the related extension of the electricity network. The LitPol Link is a key project in the context of the Baltic Energy Market Interconnection Plan aiming at integrating the Baltic electricity market into the EU energy market, as well as for the development of a new nuclear power plant in Lithuania for the supply security of the region.

4.1.4. Performance

Financial Performance

- Out of the total amount **(€ 954,70 million)** of the funds available for IIDSF (€ 723,10 million) and CPMA (€ 231,60 million) the amount allocated to defined projects is of € **881,60 million.**

- The amount disbursed from EU **(€ 763,30 million)** to IIDSF (€ 592,60 million) and CPMA (€ 170,70 million) is the amount that has been till today actually needed for contracts that have already been signed or are to be signed within next 6 months.

- The projects necessary for the period of operation have been identified, prepared and are currently under implementation or have already been implemented.

- Serious delays and additional costs have been experienced in the key infrastructural spent fuel and waste repository projects with respect to original estimates.

- A significant portion of the funding has been directed to waste management projects (spent fuel storage and waste repositories). Without those projects the defueling of the reactor units and subsequent decommissioning would not be possible.

- Delays to date have been accommodated by available slack in the system, however this slack is now almost completely exhausted and delays will soon start to impinge upon the critical path for the whole decommissioning plan, with the commensurate increase in cost.

- Large proportions of the funds have been allocated to energy projects upon request of Lithuanian government to mitigate the consequences of the closure in the energy sector. Although this being in line with the legal basis for the EU support, further efforts must concentrate on decommissioning projects as the national decommissioning fund has still largely insufficient financial resources.

- The projects which are necessary to secure the electricity supply (including energy efficiency projects) and the stability of electricity grid have been identified, prepared and are currently under implementation or have already been implemented.

Technical Performance

From the beginning of the programme, over the years there were several circumstances that led to delays of some projects` implementation (mostly decommissioning projects) that can be explained by several factors caused by the complexity of the whole process:

- Efforts of Lithuania prior to 2009 in trying to extend the INPP Unit 2 operation until 2012. This lack of commitment to close the second negatively impacted the progress of decommissioning.

- Problems with one of the main contractors where contracts were signed and immediately afterwards modified as well as the poor quality technical submissions.

- Management of the interfaces with regulators that are in charge to provide assessment and agreement to proceed for some projects has also interfered in the schedule due to unforeseen regulatory decisions (safety etc.).

- The change from an electricity production to a decommissioning company required changes in the organizational structure and changes of human resources at INPP. Such a shift, including the swap of mentality is not an overnight process and requires considerable efforts and time. This process has been driven by the new Lithuanian government (following the elections in 2008) that has taken over full ownership of the decommissioning process.

Nevertheless it must be underlined that INPP has developed and is currently finalising the full operation of a decommissioning planning tool that will allow INPP management, in case of occurring delays, to assess the potential impact on the overall decommissioning schedule and to implement appropriate mitigating measures.

4.2. Slovakia– Bohunice V1 Nuclear Power Plant

4.2.1. Closure commitment and evolution of funding

Introduction

The nuclear site Jaslovské Bohunice is situated in the west of Slovakia. Altogether there are five nuclear units of different types, two of which – V1 NPP - are subject to the EU assistance. The V1 NPP consists of two pressurised water reactors of VVER 440/230 design. These reactors were commissioned in 1978 in 1980 respectively.

The owner and responsible for the V1 NPP operation and, after shut-down, for decommissioning, is the state owned (via MoE) company "Jadrová a vyraďovacia spoločnosť a.s." (JAVYS) – the successor of Slovenské Elektrárne a.s. (SE). JAVYS is also owner and responsible for operation of waste management facilities, ISFS and RAW repository.

In the context of its accession to the EU and in compliance with Slovak Energy Policy, Slovakia committed itself to shutdown of both V1 NPP units. Unit 1 was permanently shut-down on 31 December 2006 and unit 2 on 31 December 2008.

Funding

In the period 1999-2003 pre-accession financial assistance of €90 million was made available to Slovakia as an EU contribution to the BIDSF, managed by the EBRD.

In recognition of Slovakia's closure commitment, to support Slovakia's decommissioning effort and to address the economic consequences of the early closure of the two V1 NPP units, the EU took the decision to extend its financial assistance beyond 2003. In the period 2004-2006 Slovakia's accession Protocol No. 9 foresaw the provision of €90 million of funding assistance (€100 million after adjustments for inflation). This assistance was implemented via the BIDSF managed by the EBRD.

In the period 2007-2013 the Council Regulation on the implementation of Protocol No. 9 to the Act of Accession foresaw the provision of an additional €423 million of decommissioning support, this again being implemented via the EBRD.

The following tables provide an overview of the financial support to Slovakia. Up to 2009 the provided figures represent the real commitments in accordance with the annual Commission's financing decisions.

The total financial assistance to Slovakia between 1999 and 2013 is foreseen to be €613[29] million. As of 31.12.2009 a total of €363,72 million were committed out of which € 157,807 million had been disbursed.

[29] The amount is the sum of: real commitments until the end of 2009 + forecast for 2010-2013

*Summary of EU **commitments** to Slovakia (€ million): situation as of 31.12.2009; the assistance to Slovakia is provided via the BIDSF.*

Total foreseen 1999 - 2013	Before 2004	2004	2005	2006	2007	2008	2009	Total committed
613	90	33	33	34	56,72	58	59	363,72

*Summary of EU **commitments**, **allocations** and **disbursements** (€ million): situation as of 31.12.2009*

	Total
Total committed to BIDSF	385,807
EU committed to BIDSF	363,720
Allocated to projects	364,073
Decommissioning and Waste	196,173
Energy	167,900
Disbursed - EU to BIDSF	157,807

** For commitment and disbursement procedures see chapter 3.3.1.*

4.2.2. Decommissioning and Waste window

Organisational issues

In September 1999 Slovakia committed itself to shutdown both units of V1 NPP, through the adoption of Resolution No. 801/1999.

The Framework Agreement between Slovakia and EBRD concerning the activities of BIDSF was signed in 2001 and the PMU responsible for preparation and implementation of decommissioning projects was established at SE (at that time the owner and operator of the V1 NPP, therefore beneficiary - recipient of the assistance). Consequently SE signed contracted a company already experienced in decommissioning, to be integrated within the PMU (PMU Consultant), and to deliver the Consultancy services and expertise necessary for decommissioning.

One of the important deliverables of the PMU in 2005 was the V1 NPP decommissioning and historical waste management strategy that identified needs and projects in this area.

In 2005, a company named GovCo resulting from the privatization of SE was established, and became the owner and operator of the V1 NPP. In 2006, GovCo was renamed to JAVYS (beneficiary of the assistance).

In Slovakia, the governmental Decree No. 974/2000 establishes that the first step in preparation of the V1 NPP decommissioning documentation is the development of the V1

Conceptual decommissioning plan (V1CDP). An already existing V1CDP was updated in 2006 (and "EIA report of V1 decommissioning" was elaborated). It provides general technical and financial information on possible and reasonable decommissioning options and identifies possible projects for pre-decommissioning period.

Based on V1CDP, in March 2007 the Ministry of Environment selected the Immediate V1 NPP Decommissioning as the preferred option. This option represents immediate and continuous dismantling of equipment, demolition of buildings and preparation of the site for future use. The works are divided into three stages: pre-decommissioning period (until the end of 2011), stage 1 decommissioning (non-active systems dismantling; until 2015) and stage 2 decommissioning (active systems dismantling) until 2025 when the decommissioning of the V1 NPP shall be finalized.

In order to accelerate the process and to be able to use the existing experienced staff for dismantling activities, JAVYS decided to re-evaluate the activities originally planned for different stages of decommissioning. The "Optimization study of V1 NPP decommissioning" was prepared in 2008 and identified several possibilities from which projects have risen.

In 2009 and early in 2010 the V1CDP served as a basis for the development of a detailed **Decommissioning Strategy** by JAVYS. The Strategy defines individual dismantling activities until the end of decommissioning and provides an indicative decommissioning schedule. It also states an estimation of the overall cost of the decommissioning of V1 NPP. Based on this Strategy, the decommissioning license could be obtained by 30 July 2011 and the actual decommissioning process should commence immediately thereafter.

Technical issues

Unlike in other countries some of the facilities necessary for the decommissioning already exist in Slovakia. At the Bohunice site there is a wet ISFS where the fuel will be transferred and most of the RAW treatment facilities that are needed are in operation. There is also a near surface repository for low and intermediate level RAW at the Mochovce site. Owner and operator of these facilities is JAVYS.

However V1 NPP decommissioning and historical waste management strategy identified some needs either for enlargement or refurbishment of the existing or construction of new RAW management facilities.

Today, both units are permanently shut-down. Unit 1 is completely defueled into the dedicated wet ISFS. Unit 2 will be completely defueled into the same ISFS in the beginning of 2011. The V1 operation license is valid until the end of 2011 - until then the V1 NPP will be in operation termination period (unless decommissioning license is issued earlier, as mentioned above).

From the beginning JAVYS attributed the priority first to projects which facilitate the start-up of the decommissioning activities in a safe and secure way. At the same time, during the operation termination period, systems necessary for sequential shutdown of the reactor units and operation termination are being modified, V1 NPP decommissioning documentation is being elaborated in order to obtain the decommissioning license, all fuel will be transported to the wet ISFS, operational RAW are being processed and decommissioning preparation activities are under implementation.

A selection of the key projects that were funded by the EU support is listed below (a full list of projects undertaken under the programme is to be found in the Annex):

- **The V1 NPP Decommissioning 1st stage plan and other documentation:** project for elaboration of necessary documentation in order to obtain decommissioning license

- **Reconstruction of the auxiliary boiler station and heating and steam distribution system** was undertaken in order to compensate for the loss of heating and steam supply for the nearby nuclear installations and cities.

- **Reconstruction of area protection system**: Reliable physical protection system to separate the decommissioned units 1 and 2 from the rest of the nuclear site which will remain in operation. This project has been significantly delayed due to privatisation process of SE and subsequent modifications and negotiations by JAVYS and the owner of neighbouring NPP.

- **Interim storage of RAW at Bohunice site:** Construction of the interim storage of RAW that does not comply with the acceptance criteria of the repository; buffer storage of decommissioning waste. The project is delayed because of the change of initial scope and relocation on site.

- **Storage casks for spent fuel:** Due to early shut-down and the beginning of pre-decommissioning works, it was necessary to increase the nuclear safety on site by relocating the spent fuel from the units into the ISFS. For this purpose it was necessary to procure storage casks for spent fuel.

- **Treatment of historical waste – sludges and sorbents:** The objective is to retrieve and process the RAW from storage tanks. This project experienced serious delay in the procurement phase. Whether this impacts on the issuing of the decommissioning is currently under assessment with the nuclear regulator.

- **Modification of JAVYS power supply scheme after V1 NPP final shut-down:** Modification of the power system of JAVYS to ensure the continuous supply of electricity for the decommissioning works and other installations in operation.

- **Implementation of the decommissioning programme using the human resources available at the Bohunice V1 NPP:** Financing of human resources of JAVYS dedicated to the preparation and implementation of the decommissioning projects which is more cost effective than outsourcing the works to external companies.

- **PMU Consultancy support:** On-site project management and engineering consultancy support provided to the PMU of JAVYS. The support contributed to the development, procurement and supervision of the decommissioning projects and the Decommissioning Strategy.

4.2.3. Energy window

Fulfilling the commitment to shut-down the V1 NPP led to a phase out of 880 MWe of installed generating capacity in Slovakia. Therefore it has been necessary to take measures in order to mitigate some of the negative impacts on the Slovak energy sector and to ensure safe and reliable electricity supply.

The long-term objectives of Slovakia in the field of energy are defined in the "Strategy of Energy Security of the Slovak Republic by 2030". All projects proposed for financing/co-financing from the assistance are in compliance with this Strategy.

The Slovak electricity transmission system is operated by Slovenská elektrizačná prenosová sústava a.s. (SEPS). In 2002, SEPS requested to use the assistance for financing of investment projects related to those parts and systems of the grid, which are affected directly by the final shutdown of the V1 NPP.

A selection of the key projects that were funded by the EU support is listed below (a full list of projects undertaken under the programme is to be found in the Annex)**:**

- **Reconstruction of Križovany 400kV substation:** Firstly, in order to resolve the problem of post-closure grid instability, the existing transformation sub-station Križovany has been reconstructed and adjusted to the new conditions of electricity supply.

- **Measures in the transmission sector consequent to final shut-down of V1 NPP:** In connection with the shutdown of the V1 NPP, it is necessary to install transformations in the transmission system.

- **Sustainable energy financial facility:** The objective is to extend loans to the private sector to finance measures in the housing sector for energy efficiency and rational energy utilisation (isolation of buildings, renewable energy sources).

- **Energy efficiency in public buildings:** The objective is to improve the energy balance of qualified public buildings (insulation, energy system improvements).

According to data received from the EBRD, the implementation of the actions in the energy window led to the compensation of almost 20 MWe of the loss following units 1- 2 closure.

4.2.4. Performance

Financial performance

- Out of the total amount of the funds available within the BIDSF **(€ 385,807 million)** the amount allocated to defined projects is of € **364,07 million.**

- The amount disbursed from EU to the BIDSF **(€ 157,80 million)** is the amount that has been till today actually needed for contracts that have already been signed or are to be signed within next 6 months.

- The projects necessary for the period of operation have been identified, prepared and are currently under implementation or have already been implemented.

- Delays have been experienced in some projects. Delays and mitigating measures are under assessment in order to mitigate any impact on issuance of decommissioning license.

- Fair amount of the funds has been requested for energy projects to address consequences of the closure with a substantial amount dedicated to energy efficiency projects. These are currently under preparation, implementation or have already been successfully implemented.

- As of 31.December 2009, distribution of the funds allocated between "Decommissioning and Waste" and "Energy" is in balance, with priority given to the "Decommissioning and Waste" for the coming years.

Technical performance

From the beginning of BIDSF, over the years there were several circumstances that led to delays of some projects` implementation (mostly decommissioning projects). However these delays are not jeopardizing (with some exceptions) the progress of works and are being dealt with as soon as they are identified. Some causes for delays are:

- The Immediate V1 NPP Decommissioning option was chosen as the preferred option only in 2007.

- Privatization of SE (2005-2006) led to a full restructuring of nuclear assets in Slovakia. Fluctuation of staff occurred and it influenced the preparation and implementation of the projects. The separation of one nuclear site between two companies (SE and JAVYS) led also to issues of distribution of responsibilities for common systems and the need for agreements for co-financing of projects.

- Change of organizational structure in JAVYS (2007) showed the need for the new structure and personnel to get acquainted with the situation. This change, along with some miscommunication between JAVYS, PMU Consultant and EBRD led to additional delays.

- Lack of commitment to close the plant by Slovak Government prior to 2008.

- Management of the interfaces with involved national regulatory and administrative bodies involved in the approval process of the projects.

4.3. Bulgaria – Kozloduy Nuclear Power Plant

4.3.1. Closure commitment and evolution of funding

Introduction

KNPP is located in the north-west of Bulgaria, lying on the Danube River at the border with Romania. Altogether there are 6 nuclear units of different types. Units 1-4, concerned by the shut-down commitment are pressurised water reactors of VVER 440/230 design. The units 1-2 and 3-4 were commissioned in the years 1974-75 and 1981-82 respectively.

Today, the owner and responsible for the KNPP units 1-2 decommissioning is the State Enterprise for Radioactive Waste (SERAW). For the units 3-4 it is a state owned company Natsionalna Elektricheska Kompania EAD.

In the context of its accession to the EU Bulgaria committed itself to final early closure of units 1 to 4 of KNPP. Units 1 and 2 were shut-down on 31 December 2002 and units 3 and 4 were shut-down on 31 December 2006.

Funding

In the period 1999-2007 pre-accession financial assistance of €340 million was made available to Bulgaria as an EU contribution to the KIDSF managed by the EBRD.

In recognition of Bulgaria's commitment the EU has decided to continue to provide financial assistance in continuation of the pre-accession aid in support of Bulgaria's decommissioning effort and to address the consequences of the closure, beyond 2007. The Protocol to the Treaty of Accession foresaw further assistance for the period 2007-2009 in the amount of €210 million, via KIDSF managed by the EBRD.

In 2009 Bulgaria formally requested prolongation of funding in order to proceed with an immediate decommissioning strategy. The Council Regulation ensures that the assistance continues for the period 2010-2013 and foresees the assistance in the amount of €300 million via KIDSF managed by the EBRD.

The following tables provide an overview of the financial support to Bulgaria. Up to 2009 the provided figures represent the real commitments in accordance with the annual Commission's financing decisions.

The total financial assistance to Bulgaria between 1999 and 2013 is foreseen to be €867,78[30] million. As of 31.12.2009 a total of €567,78 million was committed out of which € 363,149 million had been disbursed.

*Summary of EU **commitments** to Bulgaria (€ million): situation as of 31.12.2009; the assistance to Bulgaria is provided via KIDSF.*

Total foreseen 1999-2013	Before 2004	2004	2005	2006	2007	2008	2009	Total committed
867,78	155	85	50	50	74,28	76	77,50	567,78

*Summary of EU **commitments, allocations** and **disbursements** (€ million): situation as of 31.12.2009*

	Total
Total committed to KIDSF	606,744
EU committed to KIDSF	567,780
Allocated to projects	540,875
Decommissioning and Waste	315,500
Energy	225,375
Disbursed - EU to KIDSF	363,149

** For commitment and disbursement procedures see chapter 3.3.1.*

4.3.2. Decommissioning and Waste window

Organisational issues

[30] The amount is the sum of: real commitments until the end of 2009 + forecast for 2010-2013

The Framework Agreement between Bulgaria and the EBRD concerning the activities of KIDSF was signed in 2001 and the PMU responsible for preparation and implementation of decommissioning projects was established by KNPP.

KNPP signed a contract with the company already experienced in decommissioning, to be integrated within the PMU (PMU Consultant), and to deliver the consultancy services and expertise necessary for decommissioning.

The basic document of the decommissioning for units 1 and 2 "The Technical Design of Decommissioning Kozloduy NPP 1-2" was developed in 2001. The main subject of the document was the preparation of the Safe Enclosure of the units (deferred dismantling concept).

At the request of the KNPP this concept was revised by the PMU, and the decommissioning approach was defined in the Updated Decommissioning Strategy (UDS) for units 1-4, approved in June 2006. Based on this document the new approach is the immediate staged dismantling, the so called "Continuous Dismantling".

The Decommissioning Plan, the EIA, the Final Safety Analysis Report of the decommissioning, the residual life time assessment of plant systems, components and civil structures used during decommissioning and other documents with potential impact on the decommissioning license are either prepared or in advance stage of preparation.

With the aim to accelerate the decommissioning of units 1 and 2, according to the Bulgarian Council of Ministers Decision No. 839 from 20 December 2008 units 1 and 2 of KNPP are separated from units 3 and 4, and are declared RAW management facilities transferred to SERAW.

Technical issues

The basic project pipeline for the decommissioning of units 1-4 has been developed in line with the UDS. KNPP and the PMU are dealing now with procurement preparations of advanced decommissioning projects. It includes infrastructure preparation, waste treatment facilities, waste storage, equipment dismantling and fragmentation projects and the construction of the Dry Spent Fuel Storage Facility.

The units 1 and 2 have been defueled since November 2008 and the spent fuel assemblies are in the spent fuel ponds. The reactor cores are empty and sealed. Currently the units hold the licences that give permission for the dismantling of non-safety related equipment and systems of the units. The decommissioning licence is expected in 2011.

At Units 3 and 4, "zero power status" is now the allowed and certified operational mode. Fuel is in spent fuel ponds. The decommissioning licence is expected in 2012.

A selection of the key projects that were funded by the EU support is listed below (a full list of projects undertaken under the programme is to be found in the Annex)**:**

- **Updated Decommissioning Strategy:** Necessary upgrade of the strategy for decommissioning purposes.

- **National Disposal Facility:** According to the UDS the establishment of the National Disposal Facility for low and intermediate level RAW is obligatory for the successful

implementation of the decommissioning process of units 1-4. The activities are going well and it is expected that in 2010 SERAW will take final decisions on the proposals to be submitted to the regulator.

- **Very Low Level waste repository**: Necessary for decommissioning waste, this repository is also under development.

- **Decay storage site for transitional RAW and conventional waste**: Storage area for the transitional phase of acceptable low radioactive and conventional waste resulted during the decommissioning activities.

- **Dry Spent fuel Storage Facility:** The project for construction of **the facility** that will allow for acceleration of decommissioning of KNPP thanks to earlier defueling of units 3 and 4 is a key element of the progress.

- **Support for the Implementation of the Decommissioning using the Human Resources Available at Units 1-4 of the KNPP:** The personnel of units 1-4 is implementing decommissioning works. The early decommissioning experience proves that decommissioning gives reasonable and sufficient work for the plant personnel of units 1-4 which would otherwise have to be dismissed.

- **Heat generating plant:** The plant needed to provide hot water, steam and heating for the decommissioning activities.

4.3.3. Energy window

The loss of the nuclear units in the energy sector is a large burden to the Bulgarian economy, which requires measures to mitigate the consequences. With the four units of KNPP under decommissioning the attention in the energy window has been focused on the support of the actions to provide replacement of lost capacities, changes in the energy system and energy structure and energy efficiency related measures.

Projects financed from the EU assistance in the energy sector must be in line with the Energy Strategy of Bulgaria as part of a coherent energy and energy efficiency approach.

A selection of the key projects that were funded by the EU support is listed below (a full list of projects undertaken under the programme is to be found in the Annex)**:**

- **Implementation and Management of the Rehabilitation of the Sofia District Heating Network:** The objective was to support the modernisation, upgrading and restructuring of the Sofia district heating network.

- **Energy Efficiency and Renewable Energy Credit Line Framework Facility:** Project established a credit line through private Bulgarian banks for on-lending to the private sector for energy investments, specifically energy efficiency and small renewable projects in the private sector.

- **Maritsa East-2 - Installation of Gypsum Dewatering System and Rehabilitation of the Cooling Pump Station:** Programme for the rehabilitation of thermal power plant Maritsa.

- **Refurbishment and Extension of the National Electricity Distribution System:** Rehabilitation and modification of the electricity grid, supply and installation of substations.

- **Construction of high pressure gas pipelines and gas regulation stations:** Construction of a gas pipeline to allow replacing inefficient electricity heating.

The significant attention paid for improving energy efficiency in public buildings, mainly schools and hospitals and residential dwellings resulted in substantial energy savings. According to data delivered by the EBRD, the implementation of the actions in energy window led to the compensation of almost **500 MWe** of the loss following units 1-4 closure.

4.3.4. Performance

Financial performance

- Out of the total amount of the funds available within the KIDSF **(€606,744 million)** the amount allocated to defined projects is of € **540,875 million.**

- The amount disbursed from EU to the KIDSF **(€ 363,149 million)** is the amount that has been till today actually needed for contracts that have already been signed or are to be signed within next 6 months.

- Distribution of the funds allocated between "Decommissioning and Waste" and "Energy" is in balance, with priority given to the "Decommissioning and Waste" in the future.

- The projects necessary for the period of operation have been identified, prepared and are currently under implementation or have already been implemented.

- Rather high amount of the funds has been requested for energy projects, in particular for energy efficiency measures, to address consequences of the closure. These are currently under preparation, implementation or have already been successfully implemented.

Technical performance

The overall good technical performance can be summarised by the two mail elements:

- Review of the decommissioning strategy for Kozloduy units 1 to 4, which was changed from an initial deferred dismantling strategy to an immediate continuously dismantling strategy. This reduces the overall time for decommissioning and makes best use of available and competent staff from the power plant for executing dismantling works.

- Reorganization of the Bulgarian institutions involved that lead to separation of the KNPP reactor units 1 and 2 from units 3 and 4. Units 1& 2 are today declared radioactive waste management facilities now owned by SERAW.

The separation of nuclear site between two companies (SERAW and KNPP) bears the potential risk for delays due to the distribution of responsibilities for common systems and agreements for co-financing of projects and the organisation of the day to day work on the site. This risk is acknowledged and the process is closely followed in order to avoid a negative impact on the individual decommissioning projects.

5. CONCLUSION

All three power plants in Lithuania, Slovakia and Bulgaria were safely shut-down in line with the respective agreements and are undergoing the decommissioning works.

The assistance started before the time of accession and well before the time of shut-down of the NPPs concerned. EU assistance Programmes had to face various difficulties, on political and technical level. There were attempts to renegotiate the political commitments, however with an EU`s expression of solidarity and following the provision of financial assistance none of the Member States went as far as to the breach of the Accession Treaty.

The boundary conditions were different and unique for each country and so is the choice of technology, strategy and reasoning for the choice of projects. Due to these circumstances it is not possible to compare the assistance provided by the EU to each of the Member States, neither the efforts made by the beneficiaries concerning identification of projects based on the needs and strategic documents for decommissioning and their implementation.

Prior to the beginning of the programme at each NPP, assessment of needs and capabilities was done to define what technologies and infrastructures were already in place and what was missing. Identification and implementation of projects progressed also thanks to the re-evaluation of the national strategies or updates of the plans.

- Main areas of EU funding in Member States in decommissioning window can be divided into groups of projects:
  - Measures necessary for sequential shutdown of the reactor units and modifications of NPP systems for the purpose of operation termination.
  - Decommissioning documentation elaboration in order to obtain the decommissioning license.
  - RAW management from the decommissioning and storage of spent fuel.
  - Dismantling and demolition activities.
- Main areas of EU funding in Member States in the energy window comprise:
  - Strengthening of the transmission and transformation capacity
  - Building of the new grid interconnections and connections to new possible electricity generating capacities
  - Replacement capacities along with energy efficiency measures in the private and public building sector.
  - Investments in industrial energy efficiency and renewable energy projects

5.1. Financial performance

In individual Member States the amounts available for projects are higher than the amounts disbursed. The funds were made available on an annual basis since 1999 at the time when

Member States were not yet able to make full use of them - therefore some funds accumulated.

However good progress was shown over the last years and at the end of the reporting period the majority of either decommissioning or energy sector-related projects have been identified, were prepared and are currently in various stages of implementation.

*Overview of **funding available, allocations** and **disbursements** (€ million): situation as of 31 December 2009*

	Funding available	**Allocated to projects**	**Disbursed by EU****
Lithuania	954,7	881,60	763,30
Slovakia	385,807	364,07	157,80
Bulgaria	606,744	540,875	363,149

** For commitment and disbursement procedures see chapter 3.3.1.*

*** Disbursed to either IDSFs or CPMA*

In all three countries the majority of funding was related to decommissioning and RAW management related projects. Lithuania and Bulgaria used a significant portion of the funding for spent fuel storage and waste management - which was not needed in the case of Slovakia.

The energy sector also benefited fairly from the funding available. It was the role and responsibility of the beneficiary Member States to set the priorities for the use of the EU financial support within the boundaries fixed by the underlying legal basis.

5.2. Technical performance

The starting position of the three countries was different, amongst others because of different type of reactors to be decommissioned, existing infrastructure needed to cope with decommissioning and waste management, possibilities to replace or to import the source of energy lost, regulatory and political environment and choice of decommissioning strategy.

Despite initial difficulties, reactors were timely shut-down and the majority already defueled as a first important step towards irreversible closure and decommissioning of the plants.

Although for some projects delays occurred, these are being dealt with on individual basis in order not to impact the critical path for the whole decommissioning plan.

Facilities necessary for decommissioning, treatment and storage of RAW and spent nuclear fuel are under construction, preparation of licensing documentation is under elaboration and preparatory works for dismantling as integral part of decommissioning are ongoing. In some cases first dismantling works of non-active facilities have started.

The countries' legal framework and management structures were adapted to take into account that NPPs changed from electricity producing companies to organisations for safe decommissioning.

The energy sector benefited from the financing of measures fully in line with the EU energy policy. Almost equal financial support was paid from the beginning to the energy sector in order to cope with the loss of electricity supplies from the shut-down NPPs. This approach proved efficient later on especially in Bulgaria, when the energy sustainability problems appeared for most of the EU countries, as well as during the more recent financial crisis.

5.3. Outlook

Until 2013 measures in the decommissioning window and in the energy window will continue in line with the decommissioning strategies and taking into account priorities and the critical path.

The use of the EU assistance within the decommissioning window in the near future will be focusing on the completion of the necessary infrastructure, RAW treatment, obtaining of decommissioning license and start of dismantling. New decommissioning organisation and management structures will be in place and ready for dismantling activities. Management of decommissioning waste and execution of works by plant staff will start and will be well on track.

Energy sector projects to mitigate the consequences of the closure, to replace the shut-down capacities, to increase energy efficiency or projects related to the grid stability and reliability are all well in place or being constructed. They are deemed sufficient to cope with the consequences of the early closures by the end of 2013.

Although the last commitment of the EC will be made in 2013, the implementation of the works financed from the commitments will extend beyond this date. The costs for decommissioning of each of the power plants seem to be significantly higher than the assistance that has until today been planned. However the aim is to provide assistance to the Member States and not the full financing of the decommissioning and closure consequences. The assistance provided needs to be complemented by adequate national resources. Measures financed in the energy sector until today, seem to have sufficiently helped to mitigate the consequences and would not need additional financing beyond 2013.

6. ANNEX

6.1. List of projects - Lithuania

EBRD - IIDSF

(Title) (Short description where title not explicit)
PMU Consultant includes Final Decommissioning Plan, Decommissioning Project documentation, special technical and legal services, equipment, consumables and operating costs
Steam boiler station, Heat only boiler station, Steam and hot water pipeline renovation, Renovation of remaining heat substations
Documentation archive system
Solid waste management and storage facilities
Purchase of coated steel pipes for the gas-main Pabrade-INPP/Visaginas + Construction works for the gas-main Pabrade-INPP/Visaginas
Interim storage for INPP's spent fuel + Casks
Flue gas desulphurisation and dust collection plants,
Project Management Unit at LE PMU for CCGT project
Free release measurement systems and facility
Installation of shunt (compensating) reactor of 180 Mvar at INPP's substation Ast-330 Kv
Combined Cycle Gas Turbine Unit
Decommissioning projects for engineering, planning and licensing of dismantling and decontamination activities at INPP
Near surface repository for low and intermediate level short lived radioactive waste Design
Tools for dismantling and decontamination
Procurement Consultant transmitting line + Territorial planning and EIA for 400kv + Feasibility Study Alytus substation
Tools and equipment for radiological characterisation
Legal Services
Quantity Surveyor Services

CPMA

(Title) (Short description where title not explicit)
INPP Safe Maintenance & Decommissioning Service
Strengthening Institutional Capacity
Support to nuclear regulator - VATESI
Support to Radiation protection center
VLLW Landfill
Radiological characterisation
Visaginas district heating modernisation
Visaginas electrical network modernisation
Decommissioning Training Centre
Decommissioning and Dismantling Tools and Materials
INPP Workforce Activities
INPP Utility services
Unit 1 main circuit decontamination
INPP System Modification
Unit 1 Safe Maintenance
Unit 1 Overheads & Parts
Decommissioning and Dismantling Preparation
INPP Site Infrastructure
Unit 2 Decommissioning Project
Safety Assessment Report for Existing Storages
Radiological Characterisation
INPP Training Centre
Environment Protection Agency Monitoring Upgrade
HUDA Mechanism **Energy efficiency measures in apartment buildings**
Visaginas Energy Efficiency (Hospital)
Ignalina Energy Efficiency (Hospital)
Zarasai Energy Efficiency (Schools)
Support to RAW management Agency - RATA
National Agency
Technical Assistance to Ministry of Economy
RAW management Agency - RATA Headquarters Relocation

6.2. List of projects – Slovakia

(Title) (Short description where title not explicit)
Project Management Unit Consultant **Provision of services of a project management and engineering consulting.**
Reconstruction of 400kV substation at Krizovany
Reliable heat and steam supply: Reconstruction of the auxiliary boiler station at the Bohunice site
Reconstruction of area protection system – AKOBOJE
Update: Conceptual decommissioning plan + EIA
Container for evaporator concentrates **Provision of a container for transportation of liquid RAW.**
Sampling and analysis of resins **Characterization of certain RAW to decide on further wet RAW treatment.**
Sampling and analysis of radioactive sediments
Development of comprehensive documentation necessary for V1 NPP Decommissioning licensing phase and decommissioning implementation phase
Modification of heating and steam distribution system
Spent fuel management **Modification of the license for the spent fuel transport container and the Safety Analysis Report of the ISFS.**
Documentation configuration management system **Set up of a comprehensive digitised documentation system in V1 NPP.**
Decommissioning database **Development of a complete database of equipment and buildings of V1 NPP inventory, as well as radiological data and other characteristics required for planning and performing decommissioning activities.**
Treatment and conditioning of historical waste **Increase of the processing capacity to treat historical RAW as well as RAW from the forthcoming decommissioning of the V1 NPP.**
Feasibility study of enlargement of the National RAW repository at Mochovce
Design and licensing of new RAW disposal space at RAW repository at Mochovce
Feasibility study for treatment of metallic waste & procurement of portable fragmentation and decontamination equipment for metallic and building materials
Increase of existing fragmentation and decontamination facilities
Erection of the new large capacity fragmentation and decontamination facility at V1 NPP
Interim storage of RAW at Bohunice site
Free release of decommissioning materials **Provision of licensed methodology and resources for free release of material arising from V1 NPP decommissioning.**
Sustainable energy finance facility framework **Credit line to Slovak banks for further on-lending for sustainable energy investments.**
Reconstruction of the public warning and notification system
Storage casks for spent fuel
The V1 NPP decommissioning 1st stage plan & other documentation
Modification of the power supply system of JAVYS and SE in the Bohunice area
PMU offices relocation **Construction of new PMU offices building at the Bohunice site.**
Information centre **Construction of Information centre to increase public awareness and acceptance of the decommissioning.**
Treatment of historical waste - sludges and sorbents **Removal of radioactive sorbents and sludge from the storage tanks and their treatment.**
Modification of cooling and service water systems and raw water inlet system
Modification to site supplies of essential fluids system
Measures in the transmission sector consequential to final shutdown of Bohunice V1 NPP **Several projects for upgrade and construction of new transmission lines and transformation stations**

Energy efficiency in public buildings **Projects to improve the energy efficiency in public buildings.**
Refurbishment of the radiation protection equipment **Modification and refurbishment of the existing radiation protection facilities and equipment for V1 NPP decommissioning.**
Disposal of loose RAW **Disposal of loose unsorted waste from Bohunice site.**
Mogilnik **Disposal of solid historical, mainly metallic, intermediate level waste stored in the reactor hall.**
Human resources **Financing of specialised human resources available at Bohunice V1 NPP dedicated to decommissioning.**
Dismantling of insulation in V1 NPP turbine hall
Decontamination of the primary circuit
Dismantling and demolition of V1 NPP external buildings
Complex electric station Bystricany - transformation 400/110kV **Several projects for upgrade and construction of new transmission lines and transformation stations**

6.3. List of projects – Bulgaria

(Title) (Short description where title not explicit)
Kozloduy Project Management Unit consultancy services
Liquid radioactive waste treatment facility
Tank cleaning equipment **Purchase of equipment for the cleaning of RAW tank used during the decommissioning**
Ion exchange resin retrieval and conditioning equipment **Provision of equipment for the retrieval and conditioning of the irradiated ion exchange resins**
EIA for plasma melting facility
Safety analysis report for ion exchange resins
Sampling and characterisation of ion exchange resins
Facility for retrieval and processing of the liquid and solidified phase from evaporator tanks
Supply of waste containers
Size reduction and decontamination active workshop **Development of the needed infrastructure for the radioactive waste size reduction and decontamination activities during decommissioning**
Supply of hand tools **Provision of tools needed for the RAW size reduction and decontamination**
Dismantling / size reduction equipment – reactor buildings, auxiliary buildings **Projects for provision of tools needed for the dismantling and size reduction of the irradiated components from the reactor building and auxiliary buildings**
Decay storage site for transitional RAW/ site for conventional waste from decommissioning. **Preparation of a storage area for the transitional phase of acceptable low radioactive and conventional waste from decommissioning.**
Inventory, treatment and conditioning of contaminated soil **Development of infrastructure and support to implementation of the process of inventory, treatment and conditioning of the irradiated soil from decommissioning**
Waste backlog treatment **Development of infrastructure and procedures to identify RAW and organize its treatment during the decommissioning**
Very low level waste repository **Development of infrastructure and preparation of the process of managing very low radioactive storage repository during the decommissioning**
Elaboration of a Safety Analysis Report for the RAW Management Facility "Kozloduy NPP Units 1 and 2"
Dry Spent Fuel Storage Facility and its extension **Construction of a facility for the storage of VVER 440 fuel unloaded from units 1-4**
Equipment for sample analysis **Provision of equipment for radioactive monitoring**
Supply of consumables for radiochemistry laboratory
Upgrade of free release measurement facility
Supply of personnel portal monitors
Decommissioning strategy **Update of the decommissioning strategy**
Decommissioning plan **Update of the decommissioning plan**
Decommissioning material management strategy **Update of the decommissioning material management strategy**
Tank level measuring systems
Space management co-ordination for AB-1 and AB-2 **Development and implementation of actions needed to assure the space management in the auxiliary buildings**
Control of liquid and gaseous releases **Provision of equipment for the radioactive monitoring of the liquid and gaseous releases**

Equipment for radiological inventory **Provision of equipment for performing the inventory of the radiological impact during the decommissioning**
Evaluation of radiological inventory **Development and implementation of the process of performing the inventory of the radiological impact during decommissioning**
Size reduction equipment area in the turbine hall **Provision of equipment for the size reduction of dismantled components in the non radioactive zone of the turbine building**
Dismantling tools and equipment – turbine hall **Provision of dismantling tools and equipment for the decommissioning activities in the turbine building**
Free release facility **Development of the facility for free release of non contaminated gases during the decommissioning activities**
Infrastructure separation / metering **Activities for separation of infrastructures designated for specific activities during the decommissioning**
Infrastructure separation / service water systems
Infrastructure separation - heating and domestic steam
Artesian water pipeline replacement
Heat generation plant + EIA **Construction of the plant to provide hot water, steam and heating for specific activities during the decommissioning**
EIA for decommissioning
Preparation of decommissioning Safety Analysis Report - Stage 1&2 **Preparation of the safety report for the first and second stages of decommissioning**
Rest of lifetime **Evaluation of the rest of lifetime of the plant buildings as required by the decommissioning procedures**
Development of information centres for decommissioning
Supply of software for the decommissioning management system
Supply of multifunctional input device for decommissioning management system
Core sampling analysis **Acquisition of the reactor core sample analysis performed during the decommissioning**
Asbestos removal equipment **Provision of the equipment for the removal of the asbestos in the turbine building**
Provision of equipment for demolition of structures inside the turbine hall, auxiliary building and reactor buildings
Training and development in decommissioning **Training of staff in order to be prepared for the decommissioning activities**
Human resources **Financing of implementation of the decommissioning programme using the human resources available at Units 1-4 of KNPP**
Economic and energy efficiency measures in the power distribution systems, public buildings and street lighting
Rehabilitation of the Sofia district heating network
Energy efficiency and renewable energy credit line framework facility in Bulgaria **Credit line to Bulgarian banks for further on-lending for sustainable energy investments**
Implementation and management of the demand side energy efficiency measures in public buildings
Pernik district heating rehabilitation programme
Residential energy efficiency credit line framework facility in Bulgaria
Energy efficiency facility in Bulgaria
MARITSA EAST-2 REHABILITATION PROGRAMME - Installation of gypsum dewatering system and rehabilitation of the cooling pump station
Refurbishment and extension of the national electricity distribution system – supply and installation of substations

Construction of high pressure gas pipelines to, and gas regulation stations in Silistra, Kozloduy and Oryahovo
Rehabilitation of municipality street lightening
Replacement of outdated, 20-30 year old, power transformers with work load factor less than 60% with new ones with higher efficiency and reduced losses
Installation of natural gas supply pipeline for 13 cities in the South-Central region of Bulgaria, without building high pressure gas branch
Construction of the gas distribution network in town Dimitrovgrad, Chirpan and Rakovski
Installation of natural gas supply system in town Etropole without construction of high pressure gas branch
Installation of the natural gas supply system in town Svilengrad and Kardjali without construction of high pressure gas branch
Main gas pipeline to village Razliv and the development of the gas distribution system within Razliv
Rehabilitation of pipelines in Varna city heating distribution network
Energy efficiency improvements in public buildings in the municipalities of Kozloduy and Novi Han
Energy efficiency improvements in public buildings
Energy efficiency rehabilitation of the heavy industrial mining equipment of the Maritza east mines
Construction of a small hydro power plant on the Iliina river for the safe and reliable energy supply and for the energy efficiency improvements of the area
Technical assistance in the preparation of energy performance contracts for the energy efficiency rehabilitation of buildings within the public sector
Purchase and installation of automated metering systems for control of electricity losses in high, medium and low voltage distribution networks operated by E.ON BULGARIA GRIDS AD
Construction of a heating plant on the basis of wood biomass and in the development of the heat transfer network in town Triavna