



Brussels, 13.6.2018  
SWD(2018) 342 final

**COMMISSION STAFF WORKING DOCUMENT**  
*Accompanying the document*

**Proposal for a Council Regulation**

**establishing the nuclear decommissioning assistance programme of the Ignalina nuclear power plant in Lithuania (Ignalina programme) and repealing Council Regulation (EU) No 1369/2013**

{COM(2018) 466 final}

1.	INTRODUCTION: POLITICAL AND LEGAL CONTEXT.....	3
1.1.	Scope and context.....	3
1.2.	Lessons learned from previous programme.....	6
2.	THE OBJECTIVES.....	9
2.1.	Challenges for the programme of the next MFF.....	9
2.2.	Objectives of the programme of the next MFF.....	10
2.2.1.	General objectives.....	10
2.2.2.	Specific objectives.....	11
3.	PROGRAMME STRUCTURE AND PRIORITIES.....	12
4.	DELIVERY MECHANISMS OF THE INTENDED FUNDING.....	13
4.1.	Policy option 1 - Discontinuation of Ignalina programme.....	14
4.2.	Policy option 2 - Ignalina programme under cohesion policy (ESIF).....	15
4.3.	Policy option 3 - Ignalina programme as dedicated spending programme.....	16
4.4.	Policy options benchmark.....	17
5.	HOW WILL PERFORMANCE BE MONITORED AND EVALUATED?.....	18
5.1.	Programming, monitoring, reporting and evaluation.....	18
5.2.	Performance indicators.....	18
5.3.	Preliminary evaluation criteria.....	19

## Glossary

<i>Term or acronym</i>	<i>Meaning or definition</i>
CPMA	Central Project Management Agency (Lithuania)
EBRD	European Bank for Reconstruction and Development
ECA	European Court of Auditors
ESIF	European Structural and Investment Funds
EVM	Earned Value Management
IAS	Internal Audit Service
IIDSF	Ignalina International Decommissioning Support Fund
INPP	Ignalina Nuclear Power Plant
ISSG	Inter-service Steering Group
KPI	Key Performance Indicator
MFF	Multi-annual Financial Framework
NDAP	Nuclear Decommissioning Assistance Programmes, whereby the EU provides financial support to Lithuania to shut down and decommission two reactors at the Ignalina nuclear power plant, to Bulgaria to shut down and decommission four reactors at the Kozloduy nuclear power plant, and to Slovakia to shut down and decommission two reactors at the Bohunice V1 nuclear power plant.
NPP	Nuclear Power Plant
RBMK	Реактор Большой Мощности Канальный / Reaktor Bolshoy Moshchnosti Kanalnyy (“High Power Channel-type Reactor”) is a class of graphite-moderated nuclear power reactor designed and built by the Soviet Union (e.g. Chernobyl nuclear power plant, Ignalina nuclear power plant)

## 1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT

### 1.1. Scope and context

The present ex-ante evaluation relates to the Ignalina programme (the 'programme') whereby the European Union (EU) provides financial support to Lithuania to decommission the two RBMK-1500 reactors of the Ignalina Nuclear Power Plant (NPP) located nearby the town of Visaginas. The decommissioning of these reactors - same type as in Chernobyl – is a first-of-a-kind activity entailing technological challenges such as the dismantling of graphite cores and the subsequent management of important amounts of irradiated graphite.

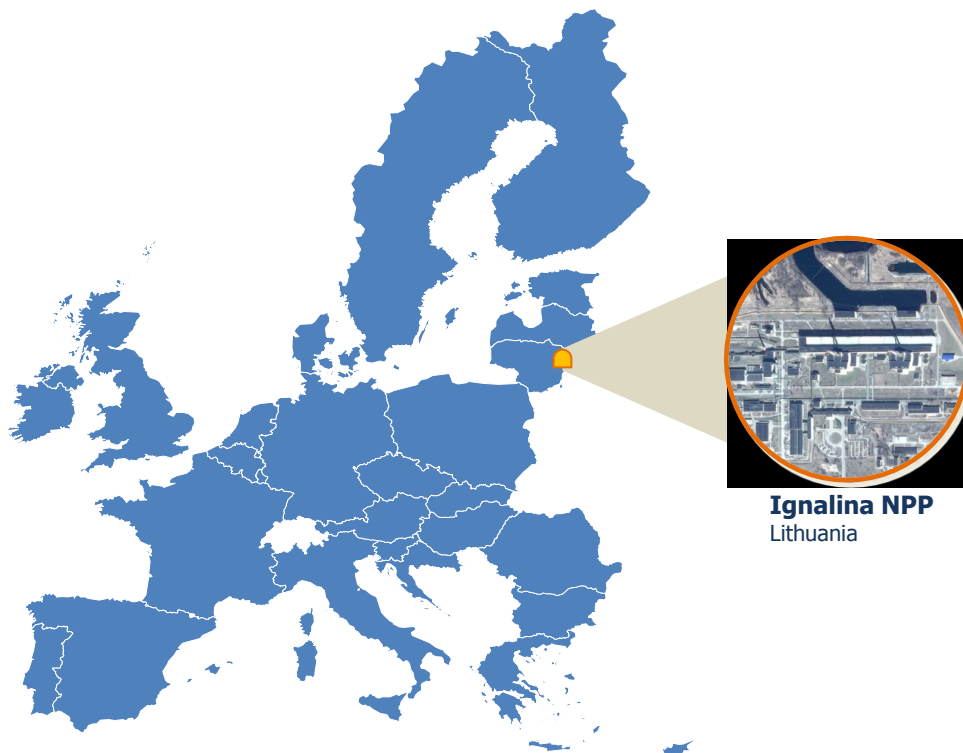


Figure 1 – Ignalina nuclear power plant site.

The programme originated in the context of the negotiations for accession to the European Union of Lithuania, which took the commitment to close and subsequently decommission the two Soviet-designed nuclear reactors by a commonly agreed date. As an act of solidarity, the European Union committed itself to provide financial assistance for the decommissioning of Ignalina Nuclear Power Plant. The closure commitment of Lithuania as well as the commitment of the EU to provide financial support was foreseen in the Lithuania's Accession Treaty<sup>1</sup> (Lithuania acceded in 2004).

Lithuania has fulfilled its accession treaty commitment to close its reactors in a timely manner<sup>2</sup>. Based on the provisions of Lithuania's Accession Treaty<sup>3</sup>, the Council of the European Union has adopted beyond 2006 successive Regulations<sup>4,5</sup> for the implementation of the decommissioning.

<sup>1</sup> OJ L 236, 23.9.2003, p. 33 and p. 944

<sup>2</sup> Ignalina NPP Unit 1 was shut-down in 2004 and Unit 2 in 2009.

<sup>3</sup> Article 3.1 "Recognising that the decommissioning of the Ignalina Nuclear Power Plant is of a long-term nature and represents for Lithuania an exceptional financial burden not commensurate with its size and economic strength, the Union shall, in solidarity with Lithuania, provide adequate additional Community assistance to the

This ex-ante evaluation is carried out in preparation of the next MFF and it is based on the lessons learnt and progress achieved so far. The assessment of policy options is not strictly required for an ex-ante evaluation. However, a main purpose of this evaluation is to examine if the existing instrument should be:

- (i) discontinued in the next MFF, or
- (ii) merged into the Funds under cohesion policy, or
- (iii) continued as a dedicated programme.

This is linked to a recommendation issued by the European Court of Auditors (ECA) in their latest performance audit on the nuclear decommissioning assistance programme and to the associated reply provided by the Commission<sup>6</sup>.

The programme has been indeed subject to extensive audits in the first part of the current MFF: an internal audit conducted by the Internal Audit Service (IAS) that resulted in three recommendations<sup>7</sup>, all implemented to date; a performance audit of the ECA that issued a special report<sup>8</sup> resulting in eight recommendations, either fulfilled or under implementation according to the established plan.

Originally and until 2013 the European Union assistance was designed to support Lithuania both in its efforts to shut down and decommission the concerned reactors, but also to address the consequences of early closure of its nuclear power plant installation. The assistance covered thus actions such as enhancement of security of supply and energy efficiency. This has changed under the current MFF where the scope of the programme was restricted to decommissioning activities only, i.e. on safety related measures. The disposal of spent fuel and radioactive waste in a deep geological repository was never part of the programme. This shift from financing a complex mix of energy and decommissioning projects towards a dedicated and focused effort on the decommissioning programme resulted in increased effectiveness and efficiency.

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decommissioning effort beyond 2006." Article 3.2 "The Ignalina Programme will be, for this purpose, seamlessly continued and extended beyond 2006. Implementing provisions for the extended Ignalina Programme shall be decided [...] and enter into force, at the latest, by the date of expiry of the current Financial Perspective. [...]" Article 3.4 "For the period of the next Financial Perspectives, the overall average appropriations under the extended Ignalina Programme shall be appropriate. Programming of these resources will be based on actual payment needs and absorption capacity." (2003 Act of accession, Protocol No 4 on the Ignalina nuclear power plant in Lithuania (OJ L 236, 23.9.2003))

<sup>4</sup> Council Regulation (EC) No 1990/2006 of 21 December 2006 on the implementation of Protocol No 4 on the Ignalina nuclear power plant in Lithuania to the Act of accession of the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia "Ignalina Programme" (OJ L 411, 30.12.2006, p.10)

<sup>5</sup> Council Regulation (EU) No 1369/2013 of 13 December 2013 on Union support for the nuclear decommissioning assistance programme in Lithuania (OJ L 346, 20.12.2013, p.7)

<sup>6</sup> The Commission's reply to recommendation 5 ("Discontinue dedicated funding programmes for nuclear decommissioning in Lithuania, Bulgaria and Slovakia after 2020") of the ECA Special Report 22/2016 reads: "The Commission will carry out an impact assessment [...] with regard to proposals of new [NDAP] initiatives. This impact assessment will explore whether funding should be continued and if so the most suitable financing mechanisms."

<sup>7</sup> The recommendations concerned the assessment of ex-ante conditionalities, the control strategy, and the co-financing.

<sup>8</sup> ECA Special Report 22/2016 - EU nuclear decommissioning assistance programmes in Lithuania, Bulgaria and Slovakia: some progress made since 2011, but critical challenges ahead.

More in particular, in the MFF 2014-2020 the programme objectives have been specified as follows:

Table 1: Ignalina programme specific objectives for MFF 2014-2020

	SPECIFIC OBJECTIVES
<b>Ignalina programme</b>	<ul style="list-style-type: none"> <li>→ Defueling of the reactor core of Unit 2 and the reactor fuel ponds of Units 1 and 2 into the dry spent fuel storage facility;</li> <li>→ Safely maintaining the reactor units;</li> <li>→ Performing dismantling in turbine halls and auxiliary buildings;</li> <li>→ Safely managing the decommissioning waste in accordance with the detailed waste management plan.</li> </ul>

The implementing procedures<sup>9</sup> of the current Regulation established the baseline (decommissioning plan) for the decommissioning programme up to the respective end-state and provided concrete targets per each specific objective.

The European Union financial assistance has been implemented by indirect management<sup>10</sup> since its inception. It has been made available through pillar assessed implementing bodies in the form of contributions to:

- (i) the Ignalina International Decommissioning Support Fund (**IIDSF**) managed by the European Bank for Reconstruction and Development (**EBRD**) since 2001;
- (ii) the Central Project Management Agency (**CPMA**) since 2003.

The total financial assistance from the European Union to Lithuania for the decommissioning of the concerned reactors as well as for mitigation measures in the energy sector until the end of 2020 sums up to EUR 1 818 million. Thereof, EU assistance earmarked for decommissioning of the two reactors until the end of 2020 sums up to EUR 1 494 million (see Annex 2).

As mentioned, the final decommissioning plan (baseline) was prepared in 2014<sup>11</sup>. This plan sets out the schedule (covering a timespan longer than the MFFs) and the cost estimates for the decommissioning activities until the accomplishment of a well-established end-state. Funding provided in this MFF is fit for effective and efficient accomplishment of the related objectives.

In line with the Rome Declaration<sup>12</sup>, the EU budget should enable a Europe that is safe and secure; this is a dimension where the Nuclear Decommissioning Assistance Programme (NDAP) has contributed so far and may further contribute, especially in Lithuania. The main positive impact to be achieved by the NDAP is indeed the progressive decrease of the level of radiological hazard for the workers, the public and the environment in Lithuania but also in the EU as a whole. Nuclear decommissioning and waste management are key processes of a modern, clean and circular economy.

<sup>9</sup> Commission Implementing Decision of 7.8.2014 on the rules of application for the nuclear decommissioning assistance programmes for Bulgaria, Lithuania and Slovakia for the period 2014-2020 — C(2014) 5449 final

<sup>10</sup> Art 60 Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union

<sup>11</sup> The definition of a detailed decommissioning plan and the associated financing plan was a pre-condition (ex-ante conditionality) to the launch of the programme in the MFF 2014-2020. These plans describe in detail the decommissioning strategy, how the facilities will be safely dismantled, how radiation protection of workers and the public is ensured, how environmental impacts are addressed, how materials – radioactive and non-radioactive – are to be managed, and how the regulatory authorisation for the facilities and sites are to be terminated.

<sup>12</sup> Declaration of the leaders of 27 member states and of the European Council, the European Parliament and the European Commission (25 March 2017)  
<http://www.consilium.europa.eu/en/press/press-releases/2017/03/25/rome-declaration/pdf>

Like all existing EU instruments the programme needs to undergo the EU value added test in line with the reflection paper<sup>13</sup> on the future of EU finances. As reflected in the list of options, consideration is hereby given whether the programme remains indispensable or whether there is scope for merging programmes or modifying them with a view to budgetary flexibility and/or simplification, which are other key principles underpinning the next MFF. The programme's EU added value test fits into the lines and principles drawn by the Commission in its Communication<sup>14</sup> on a new, modern Multiannual Financial Framework post-2020.

The Ignalina programme has taken the attention of both the European Parliament and the Council of the European Union. Both bodies intervened specifically on the NDAP after the publication of the dedicated ECA Special Report<sup>15</sup>.

The European Parliament<sup>16</sup> underlined that nuclear safety is of prime importance, not only for Lithuania but for the population in the whole Union and its neighbourhood and called upon the Commission to perform a thorough assessment of the needs for continuation of the dedicated funding programme for nuclear decommissioning in Lithuania beyond 2020. It underlined furthermore that the closure of Ignalina nuclear power plant was a condition placed by the Union on the accession of Lithuania in exchange for Union support for its closure, decommissioning and mitigation of the social and economic impacts (as defined in Protocol No. 4 of the accession treaty<sup>1</sup>).

The Council<sup>17</sup> also recalled that the premature closure and subsequent decommissioning of the two Soviet-designed nuclear reactors in Lithuania was one of the conditions for accession to the EU. It further underlined the fact that this condition entailed a significant financial burden based on which the EU agreed to provide financial assistance, underscored the need for adequate supporting actions for the decommissioning of Ignalina nuclear power plant to ensure successful completion of the decommissioning processes whilst maintaining a high level of nuclear safety, and noted that any potential new EU funding beyond 2020 should include clear rules and the right incentives to pursue decommissioning, with regard to both financing and timing.

## **1.2. Lessons learned from previous programme**

A mid-term evaluation of the NDAP was conducted pursuant to Article 9 of the relevant Council Regulation<sup>5</sup> in line with the Better Regulation guidelines. The mid-term evaluation considered and assessed the results and impacts, the efficiency of the use of resources and its Union added value. The evaluation focused on the period 2014-2017 but considered where relevant the previous financial framework (2007-2013).

For the mid-term evaluation the Commission gathered relevant information and data by extensively involving key stakeholders (i.e. Ministries, implementing bodies, decommissioning operators, members of the NDAP Committee).

Moreover, an Open Public Consultation was launched by the Commission in June 2017 for an extended duration of 14 weeks. The consultation received limited interest (20 responses). In addition to this consultation, a targeted e-survey consultation was launched in July 2017; it gathered an additional 17 responses (1 from Bulgaria, 4 from Lithuania and 12 from Slovakia)

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<sup>13</sup> Reflection Paper on the Future of EU Finances - COM(2017) 358

<sup>14</sup> Communication from the Commission to the European Parliament, the European Council and the Council - A new, modern Multiannual Financial Framework for a European Union that delivers efficiently on its priorities post-2020 - COM(2018) 98 final

<sup>15</sup> ECA Special Report 22/2016 - EU nuclear decommissioning assistance programmes in Lithuania, Bulgaria and Slovakia: some progress made since 2011, but critical challenges ahead

<sup>16</sup> Committee on Budgetary Control "Report on the Court of Auditors' special reports in the context of the 2015 Commission discharge" (2016/2208(DEC))

<sup>17</sup> Council conclusions on the ECA Special Report No 22/2016, adopted by the Council at its 3511th meeting held on 13 December 2016 (document n° 15534/16 ATO 68)

from 90 stakeholders contacted in total. The replies received were overall positive about the NDAP but did not provide any additional new input on the programmes. These two consultations were complemented with targeted consultations of around 100 interviews with decommissioning operators and relevant stakeholders.

The conclusions of the NDAP mid-term evaluation can be summarised as follows:

*Coherence with EU policies.* The mid-term evaluation concluded that the NDAP are **coherent with EU policies aiming at ensuring the highest level of nuclear safety**. The EU support through the NDAP ensures that the immediate dismantling strategy in Lithuania is steadily pursued and prevents that undue burden is transferred to future generations, while it partially derogates for historical reasons to the ultimate responsibility of the Member State to ensure adequate financial resources for nuclear decommissioning and radioactive waste management.

*Progress.* In line with expectations set for the MFF 2014-2020, **Lithuania has progressed effectively and efficiently in the decommissioning of its reactors** in line with the agreed baseline (decommissioning plan). There have been challenges and setbacks due to the programme's complexity, but the management system has proven increasing ability to cope with such challenges. Roadblocks from the previous financial framework were removed and delays carried over were recovered to the extent possible.

*Safety.* The analysis demonstrated also that **substantially improved levels of safety** are going to be achieved at the site as a result of the Union funding in this MFF. In Lithuania, the main ongoing developments in the field are the steady progress of removing spent fuel from the reactor buildings and the preparations for dismantling the irradiated graphite from the reactors' core, which is a first-of-a-kind project of unprecedented scale.

*Financial scope.* The preparation and endorsement in 2014 of the decommissioning plan was a major milestone and clarified the scope, schedule, and budget of the decommissioning programme. Between 2014 and 2016, the Commission has analysed this baseline and concluded that it is based on a complete and comprehensive plan, and on a sound overall cost estimate which could be improved further by considering a higher level of contingencies (max 16%). In 2017, the Lithuanian authorities confirmed that the cost estimates for the programme remains unchanged and in line with the agreed decommissioning end-state.

Beyond 2020, the raising of additional funds needed until 2038 for the decommissioning of Ignalina NPP calls for a careful follow-up as the financing gap is sizable (EUR 1331 million).

*National contribution.* The mid-term evaluation showed that the **achieved levels of national contribution appear fit to sustain proper efficiency**; nonetheless, co-financing is not established in the legal basis, thus creating continued uncertainties that should be removed. Moreover, the analysis showed that increasing levels of national contribution are a necessary but not a sufficient condition to set the right incentives for timely and efficient decommissioning. To this end, the explicit transfer of risks (cost overruns, delays) to the Member State would have a greater impact. This practice has been already introduced to a certain extent under the current MFF where possible.

*Governance.* The **governance setup has ensured effective and efficient implementation of the programme** and compensated for the uncertainties mentioned on the national contribution aspects. Main factors of success were clear definitions of roles and responsibilities as well as a strengthened monitoring framework. The analysis has also identified areas for further improvement such as:

- (i) increased involvement of the Member State (programme coordinator and financial coordinator) for increased ownership together with stronger accountability of the decommissioning operator (final beneficiary);



- (ii) streamlining of procedures to enhance the timeliness of the management cycle;
- (iii) increased inter-comparability with other programmes' performance.

*Objectives.* The mid-term evaluation confirmed that the general objective<sup>18</sup> and the main specific objectives<sup>19</sup> of the NDAP remain valid in the current MFF. Nevertheless, some of the expected results, milestones, target dates, as well as the corresponding performance indicators should be adapted in line with the latest updates of the decommissioning plan to allow for effective monitoring for the period 2018-2020.

Although the reduction of the ultimate risk to the general population posed by the facility while ensuring that the decommissioning is conducted in a safe manner have been the driving factors behind the NDAP, the mid-term evaluation noted that these aspects have not been well captured in the high level monitoring framework that is the basis for communication of the results to external parties (e.g. reporting to the Council and the Parliament). Any post-2020 funding should therefore focus on explicit safety objectives monitored by means of dedicated performance indicators.

*Knowledge gain.* Finally the mid-term evaluation has highlighted that the experience gained so far from the projects implemented under NDAP in Lithuania, as well as in Bulgaria and Slovakia, provides a solid base of knowledge in the EU for conducting ongoing and future decommissioning activities. These EU co-funded programmes may aim at becoming a solid benchmark for governance related issues and management practices such as cost estimation methodologies or planning, and persisting technological challenges such as the dismantling of graphite-moderated reactors and the subsequent management of important amounts of irradiated graphite.

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<sup>18</sup> The general objective of the programme is to assist the Member State concerned in implementing the steady process towards the decommissioning end state of the concerned NPP in accordance with its respective decommissioning plan, whilst maintaining the highest level of safety.

<sup>19</sup> For LT: (a) defueling of the reactor core of Unit 2 and the reactor fuel ponds of Units 1 and 2 into the dry spent fuel storage facility; (b) safely maintaining the reactor units; (c) performing dismantling in the turbine hall and other auxiliary buildings and safely managing the decommissioning waste in accordance with a detailed waste management plan.

## 2. THE OBJECTIVES

### 1.3. Challenges for the programme of the next MFF

The key aim in nuclear decommissioning is the progressive removal of hazards inherently associated to the concerned installations. This process is stepwise in nature, mainly because the removal of major batches of radioactive materials is obtained over several stages. The reduction of safety measures and associated costs evolves likewise.

At this point in time the decommissioning operator is focussing on dismantling activities. Dismantling & Decontamination (D&D) works are well advanced in the auxiliary buildings at the Ignalina site. In addition, the key safety-related project to remove the spent nuclear fuel from the Chernobyl type reactor buildings is now well underway.

The programme is on track to accomplish the specific objectives with the funding provided in the current MFF (2014-2020) and a clear trend towards increased efficiency was observed throughout the monitoring activities as confirmed by independent experts<sup>20</sup>. However, important safety challenges remain both of a technical and technological nature but also of a financial nature for the next financial period.

#### *Safety challenges*

Progress in the implementation of the programme in the current MFF (2014-2020) has led already to an important decrease in radiological hazard to the general public but some important milestones are still ahead. With the funds already provided, the spent nuclear fuel is currently being removed from the reactor-buildings (scheduled to be finalised by 2022). It is only after this step that the decontamination and dismantling works may commence on the reactor primary cooling circuits and cores. The funding for these activities has to be available in the next MFF. In parallel, all waste management routes have to be completed under the next MFF either for interim storage or disposal.

The technical challenges for the decommissioning of Ignalina nuclear power plant are especially complex due to its first-of-a-kind nature especially in respect to the dismantling of irradiated graphite and to the fact that a large percentage of the equipment is contaminated. Ignalina nuclear power plant is the first Chernobyl type reactor to be decommissioned worldwide. This means there is no predecessor or experience that the decommissioning operator can rely on. Open questions remain in particular with regard to the management of irradiated graphite waste. Some useful experience can be derived from other graphite moderated reactors which are currently shut down but none of these has though been completely decommissioned to date. It is worth noting that in all cases (UK, France, Spain, and Italy) SAFSTOR<sup>21</sup> strategies have been favoured.

In this respect the programme holds a high potential for the development of innovative technologies and solutions for the dismantling, conditioning and storage of irradiated graphite.

The availability of financing in a timely manner would prevent delays or even possible discontinuation of the decommissioning process. This is a crucial element for ensuring nuclear safety and the protection of the workers and the EU citizens. In case of insufficient funding, safe maintenance would be compromised and loss of unique expertise would render the whole decommissioning process more risky, difficult and costly.

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<sup>20</sup> "Support to the mid-term evaluation of the Nuclear Decommissioning Assistance Programmes", EY, An evaluation for the European Commission DG Energy, 2018

<sup>21</sup> SAFESTOR is one of the options for nuclear decommissioning of a shutdown plant. During SAFESTOR the de-fuelled plant is monitored for up to sixty years before complete decontamination and dismantling of the site, to a condition where nuclear licensing is no longer required. During the storage interval, some of the radioactive contaminants of the reactor and power plant will decay, which will reduce the quantity of radioactive material to be removed during the final decontamination phase.

As noted previously, the availability of adequate funding is at risk in Lithuania. In September 2017, the Lithuanian Government declared its political commitment to contribute as a minimum 14% of the overall decommissioning cost; for the remaining part the Member State openly relies on Union support. Presently the financing gap after 2020 is estimated at about EUR 1 331 million.

The EU funding under the next MFF (see Annex 2) together with the national contribution will cover part of the remaining decommissioning programme in Lithuania. The remaining funding gap to be covered by national contributions will be about 20% of the overall decommissioning cost and will be needed after 2030.

### *Social challenges*

The social impact in the region of Visaginas caused by the shutdown of the reactors was considerable, because Ignalina nuclear power plant was the main economic operator in this remote region at the border between Lithuania, Latvia and Belarus. After the shutdown the Ignalina nuclear power plant workforce has declined from 4 500 employees in 2003 (INPP in operation) to 1 980 employees in 2018.

In pursuing the decommissioning programme Ignalina nuclear power plant is still the major employer and contracting authority in the region. However the decommissioning programme has a limited duration, therefore the social challenges needs to be anticipated and addressed by Lithuania.

In the future, the scope of the European Globalisation Adjustment Fund shall be open to cover any type of restructuring event, also those triggered by the change to a low carbon economy. Generally speaking, the EGF can be triggered if at least 250 jobs were displaced within a period of four months. Whereas the ESF+ is designed to offer assistance in an anticipatory way, the EGF, is designed to offer assistance in the case of unexpected major restructuring events in a reactive manner.

Other available EU instruments may be deployed in the region ensuring this way synergies and complementarities. For example, the European Regional Development Fund (ERDF), the European Social Fund Plus (ESF+) and the Cohesion Fund could support measures to accompany the related social and economic transition, including also energy efficiency and renewable energy measures as well as certain other activities not linked to radiological safety processes. As such these Funds can create additional activities in the concerned region and utilise the locally available expertise as a major driver of job creation, sustainable growth and innovation.

Similarly synergies should be explored with FP9 and / or the Euratom Research and Training programme in areas such as technology development and testing, as well as training and education

## **1.4. Objectives of the programme of the next MFF**

### *1.4.1. General objectives*

The general objective of the programme in the next MFF is to **assist Lithuania in managing the radiological safety challenges of the decommissioning of Ignalina nuclear power plant.**

For the next MFF the general objective is complemented by the aim of enhancing the EU added value of the programme through **dissemination of knowledge** (thereby generated) to all EU Member States on the decommissioning process.

Finally, a key policy objective remains further increase of Member States' ownership of the decommissioning and waste management processes.

### 1.4.2. Specific objectives

The specific objectives need to be adapted to the actual progress of the decommissioning programme, the related challenges, and the need to foster knowledge sharing and potential synergies.

The decommissioning programme covers a timespan longer than the MFFs and is properly defined in terms of scope, budget, and timeline within the decommissioning plan. The abovementioned challenges are identified in the decommissioning plan and have to be tackled based on priorities dictated by radiological safety.

The disposal of spent fuel and radioactive waste in a deep geological repository is excluded from the scope of the programme, and has to be developed by each Member State in its national programme for the management of spent fuel and radioactive waste as required by the relevant directive<sup>22, 23</sup>. The Lithuanian national programme does not cover the funding for the realisation of a deep geological repository.

Four specific objectives reflect the need to progress in the removal of radiological hazards:

- (1) Perform the dismantling and decontamination of the reactor shafts top and bottom zones in accordance with the decommissioning plan; progress has to be measured by the quantity and type of materials removed as well as earned value;
- (2) Complete the design for the dismantling and decontamination of the reactor shafts central zones (graphite cores); progress has to be measured through earned value; this objective has to be accomplished with the release of relevant authorisations to carry out the dismantling and decontamination;
- (3) Safely manage the decommissioning and legacy waste up to interim storage or to disposal (depending on the waste category), including the completion of the waste management infrastructure where necessary. This objective has to be accomplished in accordance with the waste management plan; progress has to be measured by the quantity and type of safely stored or disposed of waste as well as through earned value; and
- (4) Continue downgrading radiological hazards; this objective has to be measured through the safety assessments of the activities and the facility, identifying ways in which potential exposures could occur and estimating the probabilities and magnitude of potential exposures.

The plans shall include a proper set of milestones (output, date and budget) and target amounts.

An additional specific objective should reflect the need to create and share knowledge for all EU Member States managing decommissioning programmes. When possible, additional synergies should be also developed and exploited.

- (5) Develop ties and exchanges among EU stakeholders (e.g. Member States, safety authorities, utilities and decommissioning operators) and document explicit knowledge and make it available through multi-lateral knowledge transfers on decommissioning and waste

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<sup>22</sup> Council Directive 2011/70/Euratom of 19 July 2011 on establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, OJ L 199, 2.8.2011, p. 48-56.

<sup>23</sup> Report from the Commission to the Council and the European Parliament on progress of implementation of Council Directive 2011/70/Euratom and an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects – C(2017) 236 final.

management governance issues, managerial best practices, and technological challenges, with a view to develop potential EU synergies. Progress is to be measured by the number of knowledge products created and their outreach.

Other two specific objectives reflect the general policy objective to increase the Member State's ownership:

- (6) Specify the maximum level of EU co-financing both in relative and absolute terms;
- (7) Support national initiatives to develop implementing agencies to ensure local capacity and increased ownership to govern decommissioning and waste management.

### **3. PROGRAMME STRUCTURE AND PRIORITIES**

The legal basis for the programme is Lithuania's Accession Treaty. Protocol No 4 and Article 56 2003 of the Act of Accession (AA)<sup>1</sup> state that "*the decommissioning of the Ignalina Nuclear Power Plant with two 1 500 MW RBMK-type reactor units inherited from the former Soviet Union is of an unprecedented nature and represents for Lithuania an exceptional financial burden not commensurate with the size and economic strength of the country*" and that this decommissioning is of a long-term nature.

The actions to be funded post-2020 will be derived from the latest version of the decommissioning plan and are generally responding to the safety objective. Having achieved the complete defueling of the reactors (priority funded under the current MFF), dismantling of the graphite cores has the highest priority in the next stage as it represents a major removal of radiological hazard and a first-of-a-kind activity that will serve as a benchmark for decommissioning programmes in other EU-27 Member States (France, Spain, Italy, Germany) and worldwide (Russia, UK, Ukraine, US). Additionally the safe management of decommissioning and legacy waste (e.g. bituminized waste) needs to be finalised, i.e. up until the interim storage or disposal depending on the waste category, as it represents another major removal of radiological hazard. Irrespectively of the breakdown of the programme into individual projects, the listed activities represent a critical mass for Union support.

In order of importance the priorities for the programme are:

- (i) sharper focus on safety (nuclear safety, protection of workers, public, and the environment);
- (ii) dissemination of knowledge for the EU nuclear decommissioning market;
- (iii) incentivised and enhanced performance through increased ownership;
- (iv) simplification and synergies;
- (v) solidarity.

Based on the already good established practice of the current MFF, whereby the focus of the assistance programme was restricted to decommissioning only, the programmes should further focus on activities strictly related to the achievement of the main safety objective and to the delivery of EU added value, i.e. removal of radiological hazards and creation and dissemination of relevant knowledge. The established decommissioning plan will continue to serve as the baseline, defining this way the precise scope for EU assistance. At the same time, taking into account the ECA's recommendations<sup>27</sup>, incentives to pursue decommissioning should be embedded in the funding mechanism, including time limitations and appropriate levels of national contribution from the beneficiary Member States.

The solidarity principle is enshrined in the Lithuania's Accession Treaty, calling the Union to support the Member State in dealing with this Soviet era legacy. This aspect deserves the right level of political attention, because it underpinned the agreements between Lithuania and the Union when the decision to prematurely shut-down Ignalina nuclear power plant was taken.

Hence, it is important that the programme be prioritised for further EU support in the next MFF (2021-2027) as it has the potential for achieving notable EU-added value both in terms of safety and knowledge gain.

#### **4. DELIVERY MECHANISMS OF THE INTENDED FUNDING**

In the context of the mid-term evaluation the current NDAP has been benchmarked with three 'comparator' instruments<sup>24</sup>: Connecting Europe Facility (CEF), Budget Support aid delivery mechanism and European Structural and Investment Funds (ESIF) major projects. The benchmark focused on the identification of relevant best practices concerning the governance, the programme and project management and financial management.

The benchmark showed that the performance monitoring framework for the current NDAP is generally in line with best practice – in particular practices in Budget Support operations – given that a results-based performance monitoring is in place. In this respect the NDAP could be improved by linking additional funding to the achievement of pre-defined targets.

As sought by the current NDAP, all 'comparator' instruments seek to ensure strong national ownership of project implementation through early buy in and strong Member State involvement. Member States are involved early on in the development of the projects or programmes and have input at key phases.

CEF and ESIF have a clearly defined framework for EU co-financing, with minimum and maximum EU co-financing rates set out in the legal base. Unlike these two programmes, the NDAP has no formalised framework for EU co-financing at the moment.

All instruments, the current NDAP inclusive, offer a fully multi-annual rather than annual framework for programming. While 'comparator' instruments all imposed annual monitoring and reporting requirements (similar to NDAP), none had in place an annual cycle for programming and commitments (in contrast to NDAP). Projects are implemented in line with their approved work plans. For CEF and major projects, specific approval is necessary prior to funding as well as for substantive deviations from the approved programme of works or approved budget.

The defining feature of major projects is the specific approval procedure to which they are subject to. This includes a number of analyses carried out by the Commission services with the aim to ensure the quality of the project proposal, its feasibility, maturity and its utility. The NDAP delegates this role to the Implementing Bodies that are entrusted budget implementation tasks via a Delegation Agreement.

A new financial regulation is being prepared to provide the EU with reinforced tools to implement the budget. The design of a new delivery mechanism will have to make use of the new features proposed by the financial regulation.

Based on this analysis, the following three policy options should be considered in assessing the impact of the NDAP in the next MFF:

- (i) Policy option 1 - Discontinuation of Ignalina programme,
- (ii) Policy option 2 - Ignalina programme under cohesion policy,

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<sup>24</sup> These three comparators were selected because they represent a variety of different approaches for programme implementation and are used to deliver large-scale projects, including notably in the energy sector.

(iii) Policy option 3 - Ignalina programme as dedicated spending programme.

### **1.5. Policy option 1 - Discontinuation of Ignalina programme**

Under Option 1 the implementation of the provisions of the Accession Treaty would end in 2020. No further financial EU assistance would be provided and consequently Lithuania would have to guarantee safe completion of the decommissioning programme with own national resources.

As mentioned under section 2.1 above, in case of insufficient funding, there is a risk of rendering the whole decommissioning process more risky, difficult and costly as well as result in possible safety implications and risk of loss of unique expertise.

Firstly, if compared with the Bohunice (SK) and Kozloduy (BG) programmes where significant decrease in radiological hazard to the general public has already been accomplished, the Ignalina programme is evidently at an earlier stage of this process; therefore important milestones need to be met before achieving the same level of risk reduction.

Secondly, the Commission services have found in a previous study<sup>25</sup> that the State budget of Lithuania appears able to absorb the additional financing needs but given the size of the gap the expected impact would be however significant.

Finally, the national policy and programme which are established by the Member State in application of the Council Directive 2011/70/Euratom (so called Waste Directive) include the management of spent fuel and decommissioning waste from the concerned facilities and the associate cost estimates until the completion of the programme.

In summary, given that national policy and programme are in place, key safety objectives have been met already, and the national economy appears generally fit for bearing future charges (though with certain negative impact), the discontinuation option may appear viable in some respect.

However, in such a scenario the Union would have no more leverage on the timely execution of the safety actions within the timescales set out in the approved decommissioning plan. There is a high risk that the necessary funding for the programme will not be provided in accordance with the plan, with obvious delays in the progressive decrease of the level of radiological hazard.

Moreover, the discontinuation of the NDAP could seriously harm the reputation of the EU in Lithuania as it had to shut down Ignalina nuclear power plant on request by the EU at the time of the accession negotiations. Lithuania was relying on Union support for the decommissioning as well as for measures mitigating the important effects to its economy due to the loss of inland energy production<sup>26</sup>. Lithuania communicates regularly that it counts on EU solidarity regarding the completion of decommissioning of the Ignalina nuclear power plant.

These risks should be assessed also in view of the increased programmes' effectiveness and efficiency obtained during the current MFF.

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<sup>25</sup> "Nuclear Decommissioning Assistance Programme (NDAP) – Assessment of the robustness of the financing plans considering the economic-financial-budgetary situation in each concerned Member State and of the relevance and feasibility of the detailed decommissioning plans", Deloitte, NucAdvisor, VVA Europe, A study prepared for the European Commission DG Energy, 2016

<sup>26</sup> Ignalina NPP Unit 2 counted for 25% of Lithuania's electricity generating capacity and supplied about 70% of Lithuania's electrical demand.

## 1.6. Policy option 2 - Ignalina programme under cohesion policy

Cohesion policy is the Union's main investment policy, aiming to strengthen economic, social and territorial cohesion and reduce disparities among regions. It is a major driver of job creation, sustainable growth and innovation in Europe's diverse regions.

As a result of a performance audit on the NDAP, in 2016 the ECA recommended<sup>27</sup> discontinuing the dedicated NDAP spending programmes after 2020 and considering access to ESIF for nuclear decommissioning activities. This recommendation was made with the aim to create the right incentives to pursue decommissioning and adhere to the strict rules on co-financing applicable under ESIF (i.e. fixed maximum EU co-financing rates). The Commission partially accepted this recommendation holding over its prerogative to decide based on an impact assessment (replaced by this ex-ante evaluation) in line with the requirements of the financial regulation and better regulation agenda with regard to proposals of new initiatives.

It is worth recalling that in preparation of the current MFF (2014-2020) the NDAP was already revised to exclude all measures which were not strictly related to the decommissioning of the concerned facilities. As a consequence, support to energy related projects was taken out of NDAP as it could be supported through other EU funded measures such as ESIF.

Currently, decommissioning of nuclear power stations is explicitly excluded<sup>28</sup> under ESIF (European Regional Development Fund and Cohesion Fund). Therefore, a possible funding of decommissioning under cohesion policy will lead to a fundamental change in the philosophy of these Funds, which are geared to growth objectives, notably in line with the priorities of the Europe 2020 strategy.

Several arguments can be listed *pro* the extension of eligibility under cohesion policy to the decommissioning of these specific reactors:

- (i) simplification and reduction of administrative burden;
- (ii) well-established, proven and cross-cutting management and control systems;
- (iii) increased Member State's ownership of the decommissioning programme, with clear requirements for national contributions;
- (iv) budgetary flexibility transferred to the Member State.

In other words, implementation under the shared management mode could increase the Member State's ownership of the decommissioning programme (if compared to an unchanged NDAP scenario) and would allow the Member State to prioritise decommissioning projects among other eligible projects under cohesion policy funding.

However, these advantages are offset by two substantial drawbacks:

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<sup>27</sup> Recommendation 5: dedicated funding programmes for nuclear decommissioning in Lithuania, Bulgaria and Slovakia should be discontinued after 2020. If a clear need for the use of EU funds beyond 2020 is established, in one or more of the three Member States, any future EU funding proposed by the Commission and agreed by the legislator should include the right incentives to pursue decommissioning, including by being time limited and by being based on appropriate levels of Member State co-financing. One way to do this would be to consider widening access to the European Structural and Investment Funds to allow nuclear decommissioning activities to be covered, fulfilling these conditions.

<sup>28</sup> Article 3.3 Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006;  
Article 2.2 Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006.



- (i) making decommissioning an eligible activity under cohesion policy funding, will create a precedence that goes against the principles set by the Council Directive 2011/70/Euratom on the safe and responsible management of radioactive waste and spent fuel, whereby the costs for the management of these materials shall be borne by those who generated those materials; and
- (ii) shifting of budget between priorities is possible during the entire lifetime of the programme, therefore there is a risk of de-prioritisation of decommissioning in favour of other activities financed within cohesion policy.

In the case of Lithuania a possible inclusion of decommissioning under cohesion policy would result in a considerable share of its allocation being concentrated solely on one area and one region. This would be disproportionate vis á vis other priority areas and other regions in Lithuania that are equally in need for reducing disparities.

### **1.7. Policy option 3 - Ignalina programme as dedicated spending programme**

Safety remains at the heart of the Union policy priorities<sup>14</sup>. The fundamental need of safety has been the basis for the NDAP since its inception, i.e. since the pre-accession time. Clearly this need is still the main driver for continuing the Ignalina programme under nuclear safety policies.

As a result of the NDAP mid-term evaluation the current governance setup has proven to ensure effective and efficient implementation of the programmes. Main factors of success are the clear definitions of roles and responsibilities as well as the strengthened monitoring framework.

The Member State appoints a Programme Coordinator and a Financial Coordinator (ministerial or state secretary rank) to be responsible for the programming, coordination and monitoring of the decommissioning programme, thus ensuring at national level the comprehensive oversight of the programme and enhancing access to information by the Commission in its supervisory role.

A Committee with monitoring and reporting functions is in place, co-chaired by a Commission representative and the Programme Coordinator. The Committee is well equipped with a dashboard of key performance indicators and detailed targets, in order to steer the Ignalina programme through a well-informed assessment and decision making process. The detailed objectives and indicators (proposed by the Member State and approved by the Commission) provide quantitative information to measure progress towards the specific objectives. Moreover, the Earned Value Management (EVM) methodology enhances the Commission's supervision on both effectiveness and efficiency with a positive trickle-down effect at national level.

From a legal viewpoint, the base for the continuation of the programme in Lithuania is well identified. Nonetheless the analysis and the benchmark have also identified areas for further improvement to be achieved in the establishment of a new Regulation for the next MFF, should this policy option be selected.

In particular on the EU co-financing issue, it is worth noting that presently the national contribution is generally within the ranges defined under the ESIF, although the legal basis has not defined the due level of national contribution. While this approach created uncertainties, in the present financial framework levels of national contribution have increased compared to previous financing periods. From a legal viewpoint there are no obstacles to introduce clearer criteria and provisions (in line with the ESIF ones); the decision in this respect remains truly political.

Likewise, further increase of Member State's ownership as well as stronger incentives can be devised in a dedicated spending programme, based on the other lessons learnt from 'comparator' instruments, such as limitation in time for the funding.

The Ignalina programme is currently implemented by the EBRD as well as by a national agency (CPMA). The implementation via the national agency was established upon request by Lithuania in view of increasing ownership. The EBRD support in Lithuania is phasing out. Continuing the implementation of the NDAP through the established implementing bodies would ensure stability in the safe decommissioning process.

The progress achieved under NDAP in Lithuania is significant. The existing monitoring tools – remarkably the EVM based methodology - have ensured that issues that have occurred in the implementation of projects have been addressed in a timely and efficient manner to prevent delays.

### **1.8. Policy options benchmark**

The risks associated to policy option 1 (discontinuation) can be summarised as such: EU would waive leveraging on the safety objectives of the NDAP as well as exploiting the knowledge gained in favour of other EU Member States; moreover, from a political standpoint, the solidarity principle underpinning the NDAP thus far would be disregarded by the Union with negative effect on the European sentiment in Lithuania.

Policy options 2 and 3 are mainly differentiated in terms of theme (cohesion vs safety) and delivery mechanism (cohesion policy funding vs dedicated spending programme).

Both solutions are fit for addressing the substantial needs of increased ownership by the beneficiary Member State and of stronger incentives to pursue decommissioning in a timely and efficient manner. However, policy option 3 responds more effectively to the needs of:

- (i) EU leveraging on the safety objectives;
- (ii) exploitation of the knowledge gain for the decommissioning of nuclear reactors EU wide.

## **5. HOW WILL PERFORMANCE BE MONITORED AND EVALUATED?**

The nuclear decommissioning programme is complex and long-lasting (flowing through several subsequent MFFs). Objectives are thus specifically defined for the short term (e.g. year, MFF) under the framework of a multiannual programme aimed at accomplishing the general objective.

### **1.9. Programming, monitoring, reporting and evaluation**

Under policy option 3 the programming, monitoring and control system will be further improved and streamlined with respect to the existing one; lessons learnt from the mid-term evaluation will be used in order to ensure continuous improvement.

In 2013, the Commission modified the governance of the programme for the MFF 2014-2020 in order to set out clearer roles and responsibilities, and introduced increased planning, monitoring and reporting requirements. In line with this revised governance approach, Lithuania has appointed a Programme Coordinator and a Financial Coordinator (deputy minister or state secretary) to be responsible for the programming, coordination and monitoring of the decommissioning programme at national level. Currently the Programme Coordinator has to submit the annual work programme for adoption by the Commission along with the relevant financing decision; in the next MFF the tools provided by the new Financial Regulation will be exploited and more analogies (to the extent possible) with the management and control structure for cohesion policy funding will be sought in order to ensure streamlining and simplification.

As far as programming is concerned the multiannual nature of the decommissioning programme will be reflected in the adoption of a multiannual work programme and financing decision, in line with the envisaged new financial regulation. This programming process will be evidently synchronised with the evaluation steps (an interim one after four years, and a final one five years after 2027 to ensure completion of tasks in field).

The Commission would continue entrusting the implementation of the programmes' budget to a pillar assessed implementing body (indirect management), i.e. to CPMA.

A Committee with monitoring and reporting functions is in place, co-chaired by a Commission representative and the Programme Coordinator. Implementing bodies (EBRD, CPMA) monitor on a day to day basis. In addition, the Commission services closely follow project implementation through desk and on-the-spot reviews on a biannual basis.

As far as reporting is concerned, the practice of annual reporting to the European Parliament and the Council will be maintained.

Presently the regular programming, monitoring and control cycle is supplemented by thematic verifications based on risk reviews. This practice has to continue in the next MFF.

### **1.10. Performance indicators**

The present Regulation<sup>5</sup> has defined SMART specific objectives for the progress to be achieved in the funding period; those specific objectives have been further detailed with targets and indicators within the detailed implementation procedures<sup>9</sup>.

Quite a number of output-based physical progress indicators are suitable both for defining specific objectives and for monitoring the performance (i.e. effectiveness) of decommissioning programmes; for example amounts of systems dismantled, materials released from regulatory control, radioactive waste processed, conditioned and stored or disposed of.

Another important category of indicators is project-based; for example milestones i.e. significant events in a project properly budgeted and scheduled. Moreover, project management techniques such as critical path analysis and the EVM that provides robust project-based KPIs enabling the

managers to control delays and cost-increases. Accordingly these indicators are used to assess the efficiency of the process.

The combination of output-based and project-based indicators has proven to have a high potential for programmes such as nuclear decommissioning. Output-based indicators put very specific activities under the spotlight; the information they provide is sharp and clear, but also limited in that the full picture is not covered. Complementarily the Earned Value Management KPIs provide a complete view of the progress of individual projects/work packages and can be aggregated to inform on the general state of play of the overall programme, both time-wise and cost-wise.

Such set of indicators (fully quantitative) enables control on short-term as well as on long-term issues, providing the managers (up to supervisory organisations) the tools to enact corrective or mitigation measures at the earliest time possible. This is a key feature for nuclear decommissioning programmes because the processes are not yet fully mature world-wide.

The mid-term evaluation of the NDAP has shown that this comprehensive toolkit of performance indicators has supported effective and efficient implementation as demonstrated by the deeds, i.e. accomplishments. Therefore, the performance monitoring and evaluation for the future MFF can be profitably built on both the existing system and the lessons learnt to ensure continuous improvement.

Under policy option 3 other indicators are needed to reflect safety related achievements in an even stricter manner and to match with the new explicit EU-wide knowledge sharing objective.

Progressive and stepwise removal of radiological hazards posed by the facilities under decommissioning will have to be measured based on the safety cases prepared by the decommissioning license holder.

As far as the EU-wide knowledge sharing objective is concerned, the following key items should be monitored without prejudice to the competitive advantage of the decommissioning license holder having created such know-how:

- (i) decommissioning cost estimates and estimations methodologies;
- (ii) radiation protection and industrial safety issues;
- (iii) identification of proven processes;
- (iv) irradiated graphite management (from dismantling to storage).

### **1.11. Preliminary evaluation criteria**

For the programme, the main EU co-financed endeavour for the next MFF period (2021-2027) is the dismantling of the two reactor graphite cores, including all preparatory tasks. As per the Ignalina Final Decommissioning Plan approved by the Commission at the beginning of the current MFF, the dismantling of the reactor core Unit 1 should be completed in 2030 with the funding provided in the next MFF. This activity is a true first-of-a-kind one, therefore the schedule and the budget are subject to uncertainties which call for a strict monitoring and control (and fully justify the Union solidarity).

Given the above, the current cycle of programme evaluations should be maintained, i.e. a mid-term evaluation has to be scheduled as well as the mandatory final evaluation.

# Annex 1: Procedural information

## 1. LEAD DG(S), DECIDE PLANNING/CWP REFERENCES

DG ENER, no entry in Decide Planning required

## 2. ORGANISATION AND TIMING

21 February 2018 – ISSG meeting

18 April 2018 – ISSG meeting

## 3. EVIDENCE, SOURCES AND QUALITY

The following documents have been used as input to this ex-ante evaluation:

- [1] "Support to the mid-term evaluation of the Nuclear Decommissioning Assistance Programmes", EY, An evaluation for the European Commission DG Energy, 2018
- [2] "Report from the Commission to the European Parliament and the Council on the implementation of the work under the nuclear decommissioning assistance programme to Bulgaria, Lithuania and Slovakia in 2016 and previous years" of 20.06.2017 COM(2017) 328 final
- [3] "Report from the Commission to the European Parliament and the Council on the implementation of the work under the nuclear decommissioning assistance programme to Bulgaria, Lithuania and Slovakia in 2015 and previous years" of 20.06.2016 COM(2016) 405 final
- [4] "Report from the Commission to the European Parliament and the Council on the implementation of the work under the nuclear decommissioning assistance programme to Bulgaria, Lithuania and Slovakia in the period 2010-2014" of 03.03.2015 COM(2015) 78 final
- [5] "Report on the assessment of the Nuclear Decommissioning Assistance Programme in view of the mid-term review of the financial framework 2014-2020" [Ares(2016)3562735]
- [6] "Nuclear Decommissioning Assistance Programme (NDAP) – Assessment of the robustness of the financing plans considering the economic-financial-budgetary situation in each concerned Member State and of the relevance and feasibility of the detailed decommissioning plans", Deloitte, NucAdvisor, VVA Europe, A study prepared for the European Commission DG Energy, 2016
- [7] ECA Special Report 22/2016 "EU nuclear decommissioning assistance programmes in Lithuania, Bulgaria and Slovakia: some progress made since 2011, but critical challenges ahead"

## Annex 2: Funding of the Ignalina programme

Programme	Planned end date	Cost estimate [EUR million]	Post-2020 financing gap [EUR million]
Ignalina	2038	3 377	1 331

EU Commitments - EUR million	< 2013	2014 – 2020	Total
Total (decommissioning + energy sector)	1 367	451	1 818
Decommissioning activities only	1 043	451	1 494

Average EUR million per year	2014-2020	2021-2027	Δ%
EU contribution (commitments)	64.4	78.9	+22%
EU+LT disbursements (payments)	125.6	98.5	-22%

Sources: European Commission, Decommissioning plans, Monitoring reports, Mid-term evaluation study.