

**HEADING 1A: Competitiveness for growth and jobs****Nuclear decommissioning assistance programme in Lithuania**

Lead DG: ENER

**I. Overview*****What the programme is about?***

When Lithuania was a candidate country to join the European Union, the closure and subsequent decommissioning of two Soviet-designed, first generation nuclear reactors at Ignalina was made a condition for their accession. As part of the agreement the Union declared its willingness to continue to provide adequate additional Community assistance to Lithuania's decommissioning effort and the Nuclear Decommissioning Assistance Programme was established to assist Lithuania in implementing the decommissioning of Ignalina units 1 and 2 in accordance with an approved decommissioning plan, whilst maintaining the highest level of safety.

***EU added value of the programme***

Being confronted to early closure of its plants, it was not possible for Lithuania to accumulate sufficient funds from operation of the plants.

It is therefore in the interests of the Union to provide further financial support for the seamless continuation of decommissioning in order to progress towards the so-called decommissioning end state, in accordance with approved plans, while keeping the highest level of safety. This will contribute to provide substantial and durable support for the health of workers and the general public, preventing environmental degradation and providing for real progress in nuclear safety and security.

***Implementation mode***

Directorate-General for Energy (DG ENER) is the lead DG for the programme implementation. The programme is managed under the indirect management mode through the European Bank for Reconstruction and Development and the Central Project Management Agency, a public law body in Lithuania.

**II. Programme Implementation Update*****Implementation Status (2017-2019)***

The Commission adopted the 2019 work programme and associated financing decision, allocating EUR 66.9 million for the implementation of the actions in Lithuania. These funds sum up to EUR 382.4 million allocated from 2014 to 2019.

The removal of spent-fuel assemblies from the reactor buildings (units 1 and 2) resumed in September 2016. Both reactors are now completely defueled. The removal and decontamination of equipment in the turbine hall is coming to an end.

The dismantling of the Ignalina reactors is a first-of-a-kind challenge: never before has a large power reactor with a graphite core been dismantled. In a first phase (2020 to 2027), Ignalina Nuclear Power Plant (INPP) will remove all equipment around and on top of the reactor shaft. The subsequent removal of the graphite from the shaft is being prepared with an optioneering study and detailed design of the preferred solution and a facility for the temporary storage of irradiated graphite waste.

The construction of the landfill facility for very low level waste was completed and the preparations were made for the procurement procedure of the near surface repository for low-level waste. With those two facilities, INPP will have all the tools it needs for the management, storage and disposal of the radioactive waste under the decommissioning plan.

In accordance with the updated performance baseline, the programme completion date remains 2038.

***Key achievements***

The spent nuclear fuel remaining in the reactor building represents the largest source of radioactivity to be handled by the decommissioning programme. It is being transferred to the new dedicated Interim Spent Fuel Storage Facility (ISFSF), where it will stay for several tens of years until being disposed of. By the end of 2019, over 78% of spent-fuel assemblies were safely transferred and preparations were on-going for the handling of heavily damaged fuel elements and the cleaning-up, emptying and decontamination of the spent-fuel pools. The transfer of the nuclear fuel into the safe ISFSF is contributing to a substantial decrease in the level of radiological hazard and risk to decommissioning operators and to the general public.

With 50 000 tons of material dismantled from the turbine hall, the removal and decontamination of equipment is now coming to an end. The building is being used as temporary storage for material undergoing clearance before regulatory control can be lifted and for low-level radioactive waste before it can be transferred to a final disposal facility.

The construction of the landfill facility for very low level waste was completed in 2019 and the first loading campaign is scheduled for the second half of 2020. The procurement procedure for the construction of the near surface repository for low-level waste has been launched in the first quarter of 2020.

**Evaluations/studies conducted**

The key findings of the latest (mid-term) evaluation (SWD(2018)344 final) have been presented in the Programme Statements 2020.

Internal audit (IAS)

The Commission’s Internal Audit Service completed its audit on the implementation of DG ENER’s control strategy for the delegated bodies implementing the NDAP in November 2019 (audit report IAS.C2-2018-ENER-003). It concluded that the strategy is implemented effectively, thus providing overall reasonable assurance on the effective implementation of decommissioning work financed by the programmes.

Ex post evaluation of energy projects

Until 2013, the assistance programmes allocated funds to energy-sector projects in line with the respective Member States’ accession treaties and national energy policies. The impact assessment prepared in advance of the current (2014-2020) programmes concluded that those measures would achieve their objectives with the existing funding and should then be discontinued. Therefore, the current programme is limited to implementation of the decommissioning plans, so that it is the focus of the resources and governance structures.

In 2019, the Commission finalised an *ex post* evaluation of the energy-sector projects financed in 2007-2013. Over €947 million had been committed in support of 58 projects seeking to achieve:

- environmental upgrading (including energy efficiency);
- modernisation of conventional energy production;
- restructuring and modernisation of electricity transmission and distribution;
- enhanced security of supply;

The *ex post* evaluation concluded that action under the programme was both instrumental and timely in the three countries (Bulgaria, Slovakia, Lithuania), as no other programmes could match the scope and number of projects covered. The programme gave effective support to mitigation measures along the energy value chain, according to national needs. It contributed to the building and modernisation of energy networks, facilitating connections and diversifying the energy mix. On the consumption side, it supported the refurbishment of hundreds of public and private buildings and thousands of households, the modernisation of district heating networks, greater energy efficiency in industry and better street lighting in 35 cities.

**Forthcoming implementation**

The forthcoming implementations for commitments appropriations (CA) and payment appropriations (PA) for the year 2020:

- Interim Spent Fuel Storage Facility: continuation of Units defueling and transfer of loaded spent fuel casks to the safe storage;
- First loading of the very low-level waste disposal facility;
- Near Surface Repository (NSR) for Low and Intermediate Level Short-Lived Radioactive Waste: tender for main construction works, contracting of construction works;
- Detailed design for dismantling and decontamination of equipment in Unit 1 reactor upper and lower zones;
- Detailed design for optioneering and Environmental Impact Assessment on dismantling and decontamination activities of Units 1 and 2 reactors central zone;
- Continuation of equipment isolation, dismantling and decontamination of equipment in Units 1 and 2.

**Outlook for the 2021-2027 period**

- the transfer of spent-fuel casks to the dedicated storage facility will continue;
- the continued loading of the very low-level waste disposal facility;
- the start of the construction of the low-level waste disposal facility;
- the preparations for dismantling the irradiated graphite core will move to concrete actions with expert support.

**III. Programme key facts and performance framework**

**1. Financial programming**

Legal Basis	Period of application	Reference Amount (EUR million)
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Council Regulation (Euratom) No 1369/2013 of 13 December 2013 on Union support for the nuclear decommissioning assistance programme in Lithuania, and repealing Regulation (EC) No 1990/2006	2014 - 2020	450,8
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	Financial Programming (EUR million)							
	2014	2015	2016	2017	2018	2019	2020	Total Programme
Operational appropriations	60,6	61,9	63,1	64,4	65,6	67,0	68,3	450,8
<b>Total</b>	<b>60,6</b>	<b>61,9</b>	<b>63,1</b>	<b>64,4</b>	<b>65,6</b>	<b>67,0</b>	<b>68,3</b>	<b>450,8</b>

## 2. Implementation rates

	2019				2020			
	CA	Impl. Rate	PA	Impl. Rate	CA	Impl. Rate	PA	Impl. Rate
Voted appropriations	66,953	99,99 %	32,916	99,99 %	68,290	0,00 %	68,050	0,00 %
Authorised appropriations (*)	66,953	99,99 %	32,916	99,99 %	68,290	0,00 %	68,050	0,00 %

(\*) Authorised appropriations include voted appropriations, appropriations originating from assigned revenues (internal and external) as well as carried-over and reconstituted appropriations; the execution rate is calculated on 15 April 2020

## 3. Performance information

### Programme performance

The progress against the programme's objectives is generally satisfactory. The transfer of spent-fuel assemblies (objective 1) is ahead of schedule, the operation proceeds safely (objective 2) and the output material flow (objective 3) is closely following plans. The programme end-date is maintained but delays are acknowledged in several projects outside the critical path. Maintaining a rigorous application of procurement rules and contractual arrangements has sometime resulted in unanticipated delays.

The removal of spent fuel assemblies from the Unit 1 and 2 spent fuel ponds has progressed well and over 75% of spent-fuel assemblies were safely stored in this new dedicated Interim Spent Fuel Storage Facility. The dismantling of the Ignalina reactors is a first-of-a-kind challenge: with the dismantling of the graphite core, the biggest challenge lies ahead.

The Commission measures the progress and performance of the decommissioning programmes against the objectives set out in the relevant Council Regulations. Additionally, they have been monitored through the detailed target and schedules provided for in the implementation procedures and the Earned Value Management (EVM) system. In 2019, the Commission launched a call for tender for a study on the EVM systems already implemented in each of the decommissioning programmes. The main objective of this study is to further improve the existing earned value management systems. The analysis work started in January 2020.

As the nuclear decommissioning assistance programmes progress, knowledge dissemination and synergies are becoming more important, resulting in higher efficiencies and hence substantial time and cost savings in decommissioning projects. The two proposals on decommissioning programmes introduce knowledge dissemination and developing synergies as a specific objective. In the next 2021-2027 MFF knowledge dissemination related to nuclear decommissioning will be introduced on a larger scale.

### General objectives

**General Objective 1:** To assist Lithuania towards the decommissioning end state of units 1 and 2 of the Ignalina nuclear power plant

**Indicator 1:** Number of major components and systems dismantled in all the concerned nuclear reactors in accordance with the respective decommissioning plans

Baseline	2014	2015	2016	2017	2018	2019	2020	Target
2014	Milestones foreseen							2020
- Unit 1 reactor core is defueled, unit 2 reactor core is partially defueled. - The spent fuel ponds in units 1 and 2 are loaded to maximum capacity. - Facilities for waste management treatment and storage are being constructed. - Start of dismantling works in turbine hall of unit 1.				Start commissioning Interim Spent Fuel Storage Facility	Unit 2 reactor core fully defueled		Start of transferring damaged fuel from Unit 1	Ref. Detailed Decommissioning Plan 2014 The planned completion date for the decommissioning of Ignalina units 1 and 2 is 2038.
	Actual results							

**Specific objectives**

**Specific Objective 1:** 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

**Performance**

Both reactors Units 1 and 2 are now completely defueled. The removal of spent fuel assemblies from the Unit 1 and 2 spent fuel ponds has progressed well and reached up to 12 255 assemblies i.e. 87% of the cumulative planned amount in 2020 and 78% of the total amount planned for 2022 (15 555 assemblies).

Indicator 1: Cumulative number of unloaded fuel assemblies								
Baseline	2014	2015	2016	2017	2018	2019	2020	Target
2014	Milestones foreseen							2020
Removal of spent fuel assemblies from Units 1 and 2 spent fuel ponds: Unit 1 reactor core defueled	0	0	0	3 519	7 159	10 799	13 984	13 984
	Actual results							
	0	0	267	3 519	7 796	12 255		
2014	Milestones foreseen							2019
Removal of spent fuel assemblies from Unit 2 reactor core: Unit 2 reactor core partially defueled into the spent fuel ponds; in the ponds there are used and unloaded fuel assemblies	0	0	0	454	908	1 134	1 134	1 134
	Actual results							
	0	0	0	887	1 134	1 134		

Comment: No removal of spent fuel assemblies is planned before the commissioning of the Spent Fuel Storage Facility.

**Expenditure related outputs**

Outputs		Number of outputs foreseen (F) and produced (P)						
		2014	2015	2016	2017	2018	2019	2020
Removal of spent fuel assemblies from Units 1 and 2 spent fuel ponds	F			0	3 519	7 159	10 799	13 984
	P			267	3 519	7 796	12 255	
Removal of spent fuel assemblies from Unit 2 reactor core	F				454	908	1 134	1 134
	P				887	1 134	1 134	

**Specific Objective 2:** Safely maintaining the reactor units

**Performance**

The installation has been maintained with the highest level of safety as indicated by the absence of registered incidents in 2014.

Indicator 1: Number of registered incidents								
Baseline	2014	2015	2016	2017	2018	2019	2020	Target
2014	Milestones foreseen							2020
Safe maintenance performed without incidents	0	0	0	0	0	0	0	0
	Actual results							
	0	0	0	0	0	0		

**Specific Objective 3:** Performing dismantling in the turbine hall and other auxiliary buildings and safely managing the decommissioning waste in accordance with a detailed waste management plan

**Performance**

The overall performance was satisfactory. The amounts of equipment dismantled and the overall quantity of radioactive waste processed and stored were slightly below the planned amounts of 2019 and reached respectively 84% and 80% of the cumulative planned amounts in 2020.

<b>Indicator 1: Type and number of auxiliary systems dismantled and the quantity and type of safely conditioned waste</b>								
Baseline	2014	2015	2016	2017	2018	2019	2020	Target
2014	Milestones foreseen							2020
Dismantled equipment (tonne):	5 650	12 669	25 916	29 268	34 900	40 658	47 277	47 277
	Actual results							
	5 790	14 335	21 384	30 294	35 397	39 767		
2014	Milestones foreseen							2020
Primary processed waste (m3):	4 700	5 800	14 872	15 372	25 392	35 234	42 314	42 314
	Actual results							
	6 250	7 414	12 179	19 614	26 969	33 894		

Comment: Quantitative milestones for waste production are fine-tuned in annual work programmes in function of the latest estimations of material inventories in installations to be dismantled. The values for 2015, 2016 and 2017 have been correspondingly updated.