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**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 2018 and previous years**

1 INTRODUCTION

In June 2018 the Commission established the mid-term evaluation report¹ of the European Union nuclear decommissioning assistance programmes in Bulgaria, Lithuania and Slovakia. It concluded that these Member States made effective and efficient progress in decommissioning their respective nuclear power plant (Kozloduy Nuclear Power Plant (NPP) units 1 to 4 in Bulgaria; Ignalina NPP in Lithuania; and Bohunice V1 NPP in Slovakia).

Based on a revision of the detailed decommissioning plans, the mid-term evaluation report confirmed that no additional funding is needed in the current MFF (2014-2020) and that the programmes should be continued after 2020.

At the same time the Commission adopted two proposals^{2,3} for the continued support to decommissioning activities in Bulgaria, Lithuania and Slovakia in the next multiannual financial framework (MFF) 2021 – 2027. In particular, the proposed co-funding after 2021 will enable Bulgaria and Slovakia to complete the decommissioning of the concerned reactors, and support Lithuania to continue safely and steadily the decommissioning of the Ignalina nuclear power plant, a first-of-a-kind process of unprecedented scale whereby a large amount of radioactive graphite needs to be retrieved.

The present report follows up the evaluation and reviews the further accomplishments obtained in 2018. It fulfils the reporting requirements of the relevant Council Regulations^{4,5} and forms the basis for adopting the 2019 annual work programmes under the assistance programmes. In the current Multiannual Financial Framework (MFF 2014-2020), the Commission has reported four times on this subject including the report on the mid-term evaluation of these programmes^{1,6,7,8}.

¹ Report from the Commission to the European Parliament and the Council on the evaluation and implementation of the EU nuclear decommissioning assistance programmes in Bulgaria, Slovakia and Lithuania — COM(2018)468.

² 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.

³ Proposal for a Council Regulation establishing a dedicated financial programme for decommissioning of nuclear facilities and management of radioactive waste, and repealing Council Regulation (Euratom) No 1368/2013 - COM(2018)467.

⁴ Council Regulation (Euratom) No 1368/2013 of 13 December 2013 on Union support for the nuclear decommissioning assistance programmes in Bulgaria and Slovakia, and repealing Regulations (Euratom) No 549/2007 and (Euratom) No 647/2010 (OJ L346, 20.12.2013, p. 1) & correction (OJ L8, 11.1.2014, p. 31).

⁵ Council Regulation (EU) 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 (OJ L346, 20.12.2013, p. 7) & correction (OJ L8, 11.1.2014, p. 30 & OJ L121, 24.4.2014, p. 59).

⁶ 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 — COM(2017)328.

⁷ 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 — COM(2016)405.

1.1 The nuclear decommissioning assistance programmes

When they acceded to the EU, Bulgaria, Slovakia and Lithuania committed to shutting down eight nuclear reactors before the end of their scheduled lifetime:

- Kozloduy nuclear power plant in Bulgaria (units 1 to 4);
- Bohunice V1 nuclear power plant in Slovakia (2 units); and
- Ignalina nuclear power plant in Lithuania (2 units).

The EU itself committed to providing financial assistance for safely decommissioning those reactors.

Two Council Regulations^{4,5} were adopted on 13 December 2013 to provide support to these decommissioning programmes in the MFF 2014-2020, continuing the assistance provided in previous periods and having the general objective of helping the respective Member States to reach safely the decommissioning end state while maintaining the highest safety standards. It is important to note that the current Regulations restrict the scope of the programmes to decommissioning activities only, excluding mitigation measures in the energy sector that were supported in previous periods.

The programmes are clearly defined in terms of scope, budget and planning, with end-dates scheduled beyond the current financing period. The disposal of spent fuel and radioactive waste in a deep geological repository is not included in the scope of the programmes, 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^{9,10}.

The Regulations also define the specific objectives:

All three programmes

- performing dismantling in turbine halls and auxiliary buildings;
- safely managing the decommissioning waste in accordance with detailed waste management plans.

Kozloduy and Bohunice programmes

- dismantling of large components and equipment in the reactor buildings.

⁸ 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 — COM(2015)78.

⁹ 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 L199, 2.8.2011, p. 48-56.

¹⁰ 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.

Ignalina programme

- 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;
- safely maintaining the reactor units.

2 PROGRAMME ADMINISTRATION

2.1 Method of implementation

The Commission implements the programmes' budget, in accordance with Article 62(1)(c) of the Financial Regulation¹¹, by entrusting its implementation to the following bodies:

- for all the Programmes and since 2001, the European Bank for Reconstruction and Development, an international organisation, through dedicated multi-donor funds governed by their respective fund rules;
- for the Ignalina programme since 2003, the Central Project Management Agency, a public law body in Lithuania;
- for the Bohunice programme since 2016, the Slovak Innovation and Energy Agency, a public law body in Slovakia.

The mid-term evaluation reviewed the governance setup applicable to the assistance programmes and concluded that it ensured effective and efficient implementation of the programmes. The key success factors include clear definitions of roles and responsibilities as well as a strengthened monitoring framework. In view of further improving the efficiency of the programme implementation, the adoption in 2019 of updated implementation procedures will be a key development that will lead to an update of the currently applied control strategy setting out the supervision needs, the objectives of the supervision activities, and the corresponding tools, working methods and procedures needed to achieve the supervision objectives and effective mitigation when deviations/risks are identified.

The supervision of the bodies entrusted with the programmes' budget implementation tasks by the Commission follows the rules established in the respective delegation agreements. It relies on regular assessments that the bodies fulfil the requirements for indirect management as provided for in Article 154 of the Financial Regulation. It is complemented by risk informed verifications imbedded in the regular monitoring process or assigned to an independent body.

2.2 Annual programming and monitoring

In line with the applicable procedures,¹² each concerned Member State has appointed a Programme Coordinator responsible for the programming, coordination and monitoring of the decommissioning programme at national level. The Programme

¹¹ Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 (OJ L 193, 30.7.2018, p. 1).

¹² Commission Implementing Decision of 7 August 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.

Coordinators have submitted the annual work programmes and the Commission has adopted them along with the financing decisions, in accordance with the examination procedure defined in Article 5 of the Regulation on the control by Member States of the Commission's exercise of implementing powers.¹³ These work programmes set out the planned activities for the next two calendar years, both financed from the Union budget and from national or other sources.

Committees with monitoring and reporting functions are in place for each Member State, co-chaired by a Commission representative and the respective Programme Coordinator. The bodies entrusted with budget implementation tasks monitor the project implementation on a day to day basis. In addition, the Commission closely follows programme implementation through desk and on-the-spot reviews on a biannual basis. To further support this process, the earned value management system has been introduced in order to measure project performance and programme progress in an objective manner.

2.3 Audits and evaluations

As mentioned, the Commission has completed the mid-term evaluation of the programmes¹, including a public consultation and an assessment of the programmes' results and impacts, the efficiency of the use of resources and its Union added value. As required, the evaluation addressed the scope for modification of the detailed implementation procedures¹² and as a result the Commission identified the need to update them in order to benefit from the lessons learned¹⁴.

The Commission has also launched a study of the effectiveness, efficiency and EU added-value of the energy-related projects funded by the programmes in the period 2007-2013. The study results are expected in 2019.

Moreover, the Commission has completed a thematic verification on procurement procedures under the responsibility of the bodies entrusted with programmes' budget implementation tasks. Based on 20 procurement files, it resulted that these bodies fully supported the beneficiaries in achieving economy, efficiency, transparency and accountability in all processes, as well as upholding fundamental principles of good procurement practice.

3 BUDGETARY IMPLEMENTATION AND CO-FINANCING

At the outset of the current MFF, the three Member States established detailed decommissioning plans to fulfil ex-ante conditionalities^{4,5}. These plans determined the overall cost estimates as well as the programmes' scope and schedules. The programmes should be completed in 2025 in Slovakia, 2030 in Bulgaria, and 2038 in Lithuania. The programmes' duration depends on a number of factors and boundary conditions, such as technical complexity, size of the sites and level of preparedness in waste management at the beginning of the respective programme. The Commission

¹³ Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers.

¹⁴ Commission Implementing Decision of 26 April 2019 on detailed implementation procedures for the nuclear decommissioning assistance programmes for Bulgaria, Slovakia and Lithuania — C(2019) 3073 repealing Implementing Decision C(2014)5449

assessed those plans and concluded that they were complete, relevant, comprehensive, and that the overall cost estimates were generally appropriate – as supported by the results of an independent review¹⁵. The presently allocated funds ensure effective and efficient delivery of the programmes’ objectives set out in the MFF 2014-2020.

As reported in the mid-term evaluation, the overall cost of the programmes (estimate at completion) has been stable since 2014 in Lithuania and Slovakia, while it has been revised upwards (+23%) in Bulgaria based on a due periodical re-assessment of the decommissioning plan. Correspondingly, Bulgaria has increased national contributions.

On the basis of the detailed decommissioning plans the Commission has identified the needs for the next MFF (2021-2027) and proposed for providing additional EU support^{3,3} aiming at completing the decommissioning (in Bulgaria and Slovakia) and at progressing the decommissioning (in Lithuania) by covering the needs for the next financing period and further contributing to the overall programme needs.

Since 2014 the Commission has adopted five annual work programmes and the associated financing decisions, committing the assigned budget through delegation agreements with the European Bank for Reconstruction and Development - EBRD (EUR 205.1 million for the Kozloduy programme, EUR 9.0 million for Ignalina programme, EUR 30.3 million for Bohunice programme), Central Project Management Agency in Lithuania - CPMA (EUR 306.6 million) and the Slovak Innovation and Energy Agency - SIEA (EUR 127.5 million). The Commission's payments were based on forecast contract needs and progress in project implementation.

Presently, the legal basis for EU financial support does not define a specific level of national contributions. In 2017 the Lithuanian government announced its political commitment to maintaining a minimum level of national contributions at 14 % for the programme’s entire duration. In the present financial framework national contribution levels have increased to the amounts reported in Tables 1 and 2; these show disbursements and established funds cumulated since the start of the decommissioning assistance programme. In its proposals for Council Regulations for the continued support to decommissioning activities in Bulgaria, Lithuania and Slovakia in the next MFF 2021-2027, the Commission has introduced minimum expected levels of national contribution.

Table 1 — Disbursements (payments to end beneficiaries), 30/06/2018 (€ million)

	Member State	EU*
Kozloduy	275 (41 %)	394 (59 %)
Bohunice	192 (42 %)	263 (58 %)
Ignalina	162 (14 %)	961 (86 %)

¹⁵ ‘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.

* Includes contributions from other donors.
Source: Monitoring Reports, EBRD, CPMA

Table 2 — Established funds (disbursements plus allocations), 30/06/2018 (€ million)

	Member State	EU*
Kozloduy	458	800
Bohunice	476	671
Ignalina	478	1568

* Includes contributions from other donors.
Source: Monitoring Reports, Annual Work Programmes, EBRD, CPMA

4 PROGRESS AND PERFORMANCE

The Commission measures the progress and performance of these programmes against the objectives set out in the relevant Council Regulations^{4,5}. Additionally, until 2018 they have been monitored through the detailed target and schedules provided for in the implementation procedures¹² and the earned value management system.¹⁶

To date the progress against the objectives is generally satisfactory, although delays are progressively accumulating since 2014 in the overall implementation as shown by comparing the earned value against the baseline (see figures 2, 4, and 6). However, the programmes' critical path is not affected at this point in time and the end-dates are maintained in all three Member States. After the mid-term evaluation the time profile of the activities has been revised to re-calibrate the tracking of progress and performance through the earned value management system (see figures 2, 4, and 6).

4.1 Bulgaria - Kozloduy programme

The Kozloduy nuclear power plant (NPP) units 1-4 are VVER¹⁷ 440/230 reactors: units 1 and 2 were shut down in 2002 and units 3 and 4 in 2006.

As of 2013, the decommissioning is under the control of the Bulgarian *State Enterprise for Radioactive Waste* (SERAW), a dedicated decommissioning organisation whose mission is the safe management of radioactive waste on the territory of the Republic of Bulgaria. Under the supervision of the Ministry of Energy, SERAW is the licence holder / operator in charge of the decommissioning of Kozloduy NPP units 1-4 and of the National Disposal Facility (NDF).

The Kozloduy programme made significant progress in the dismantling of equipment in the turbine hall and in the controlled area. Important waste management infrastructures – key in order to proceed with the decommissioning – became operational in 2018: a workshop for the size reduction and decontamination of dismantled equipment (since March 2018) and a facility for high-performance volume reduction of radioactive waste (the Plasma Melting Facility), whose first operational campaign started in November 2018 (see figure 1). In parallel, construction works are underway for the National Disposal Facility, i.e. the low and intermediate level waste

¹⁶ ISO 21508:2018 Earned value management in project and programme management

¹⁷ VVER, Russian: Водо-водяной энергетический реактор (Vodo-Vodyanoi Energetichesky Reaktor) or Water-Water Power Reactor is a series of pressurised water reactor.

surface repository, which will receive large quantities of the decommissioned materials.



Figure 1 - Plasma Melting Facility.

The mid-term evaluation report showed that, based on the periodical re-assessment of the decommissioning plan, the Bulgarian authorities concluded that the overall cost of the Kozloduy programme (estimate at completion) needed to be revised upward (+23%) and Bulgaria has correspondingly increased its national contributions. The end date of the programme (2030) was confirmed.

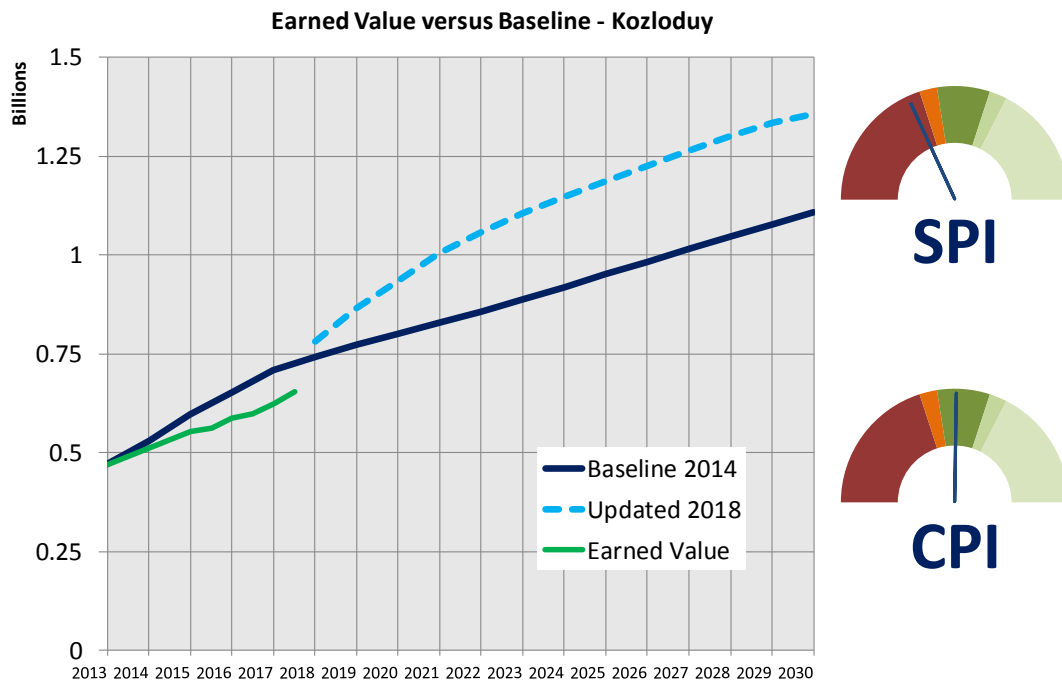


Figure 2 Programme progress and performance measured through earned value.

The earned value against the baseline shows the amount of work carried out against the plan. This is also reflected in the Schedule Performance Index (SPI). The Cost Performance Index (CPI) shows that the cost of the work carried out was as planned. The dashed line represent the baseline updated after the mid-term evaluation and will be used for future tracking and monitoring.

The plotted values include contingencies. The overall cost estimate (including contingencies) is EUR 1358 million in 2018, while it was EUR 1107 million in 2014.

4.2 Slovakia – Bohunice programme

The Bohunice V1 NPP consists of two VVER 440/230 reactors: units 1 and 2 were permanently shut down in 2006 and in 2008 respectively.

The Slovak *Jadrová a vyrad'ovacia spoločnosť*¹⁸ (JAVYS) is a dedicated decommissioning organisation whose mission is the safe decommissioning of the nuclear facilities, spent nuclear fuel management and management of radioactive waste on the territory of the Slovak Republic. It operates under control of the Ministry of Economy. JAVYS is the licence holder / operator in charge of decommissioning Bohunice V1 NPP, spent fuel management and waste disposal facilities.

The Bohunice programme has substantially progressed in 2018. Decontamination & Dismantling (D&D) works in the turbine halls and auxiliary buildings were finalised in 2018 with the demolition of the four V1 NPP cooling towers (see figure 3). Hence the first specific objective set out in Article 2.2.(b)(i) of the relevant Regulation⁴ was accomplished effectively and efficiently. Furthermore, important D&D works have also been performed in the reactor-building: in 2018 the decontamination of the spent fuel pools and other tanks in the controlled area was finalised, while the dismantling of large components of the reactor coolant systems started.



Figure 3 - Demolition of cooling towers.

The waste management infrastructure is appropriate for the present needs of dismantling and decontamination activities, and additional facilities are being realised for the future needs. The disposal route of low level waste (>90% in volume of total radioactive waste) is being extended in capacity at the existing repository in Mochovce; completion is scheduled in early 2019. Also, the new interim storage for intermediate level waste, which cannot be disposed of at Mochovce, is completed.

¹⁸ “Nuclear and Decommissioning Company”

More than 56 projects over 73 were completed. The Bohunice programme is the most advanced one and will likely represent the first complete decommissioning of VVER type reactors.

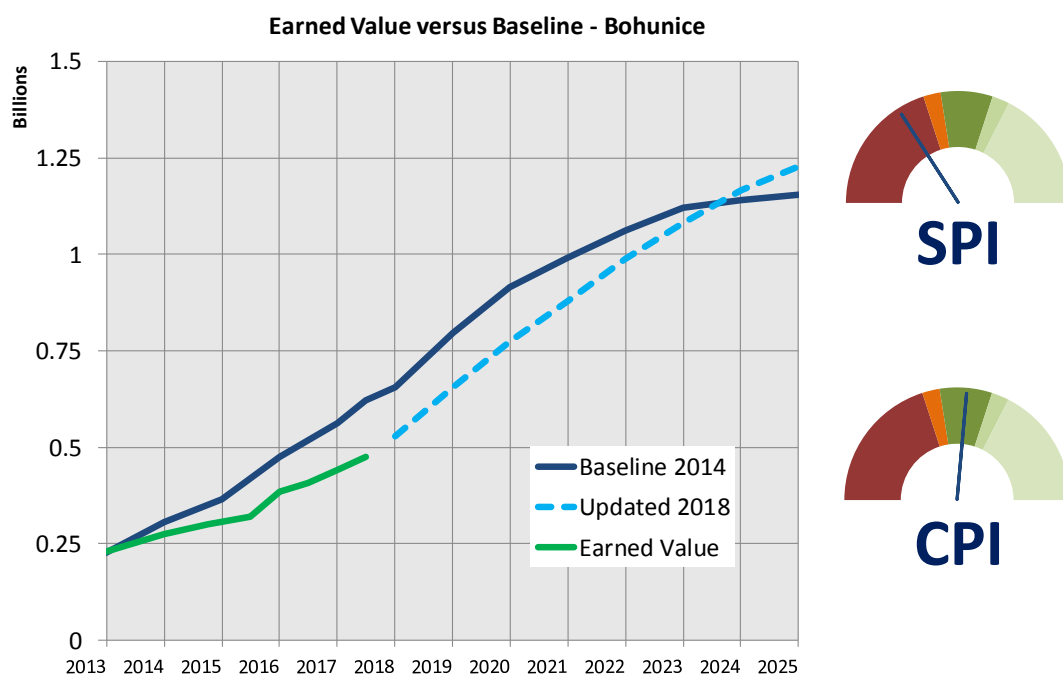


Figure 4 Programme progress and performance measured through earned value. The plotted values do not include contingencies. The overall cost estimate (including contingencies) is EUR 1238 million in 2018, while it was EUR 1246 million in 2014.

Based on the revised decommissioning plan, the mid-term evaluation report concluded that the overall cost of the decommissioning programme (estimate at completion) is slightly decreasing and the completion date remains fixed at the end of 2025. This estimate is supported by a state-of-the-art plan for risks and contingencies, which provides a high level of confidence in the estimations made.

4.3 Lithuania – Ignalina programme

The Ignalina NPP consists of two RBMK¹⁹ 1500 reactors: units 1 and 2 were shut down in 2004 and in 2009 respectively.

The Lithuanian *State Enterprise Ignalina Nuclear Power Plant* (INPP) is the licence holder / operator in charge of the facilities under decommissioning and of the waste disposal facilities. It operates under the control of the Ministry of Energy. In the last year, INPP has further adapted its structure to an effective decommissioning organisation, stronger in project management.

The Ignalina programme is a first of a kind challenge, given the Chernobyl type reactor characterised by a large graphite core. The overall cost of the programme (estimate at completion) has remained stable since 2014, likewise the completion date remains the end of 2038. The removal of spent fuel assemblies from both reactor buildings (units 1 and 2) started in September 2016. The second reactor was defueled

¹⁹ RBMK, Russian: Реактор Большой Мощности Канальный (Reaktor Bolshoy Moshchnosti Kanalnyy) or High Power Channel-type Reactor, is a class of graphite-moderated nuclear power reactor as the Chernobyl units.

fully in February 2018, i.e. 9 months earlier than planned. Both reactors are defueled and transfer operations of spent fuel from the ponds to the Interim Spent Fuel Storage Facility continue steadily. As at 31 December 2018, more than 50% of spent fuel assemblies were safely loaded into casks and put into storage. According to the schedule, all spent fuel assemblies will be removed in July 2022 (see figure 5).



Figure 5 – Casks storage.

Moreover, works have started for the construction of the Landfill Facility for Short-Lived Very Low Level Waste and the call for tender for the construction of the Near Surface Repository is ready to be launched in 2019.

In preparation for the dismantling and decontamination of the reactors' core zone to be started in the next MFF, the operator is developing an optioneering study, the environmental impact assessment and a project for the temporary storage of irradiated graphite waste. A series of workshops in 2018 allowed to inform extensively more than 40 potential international contractors.

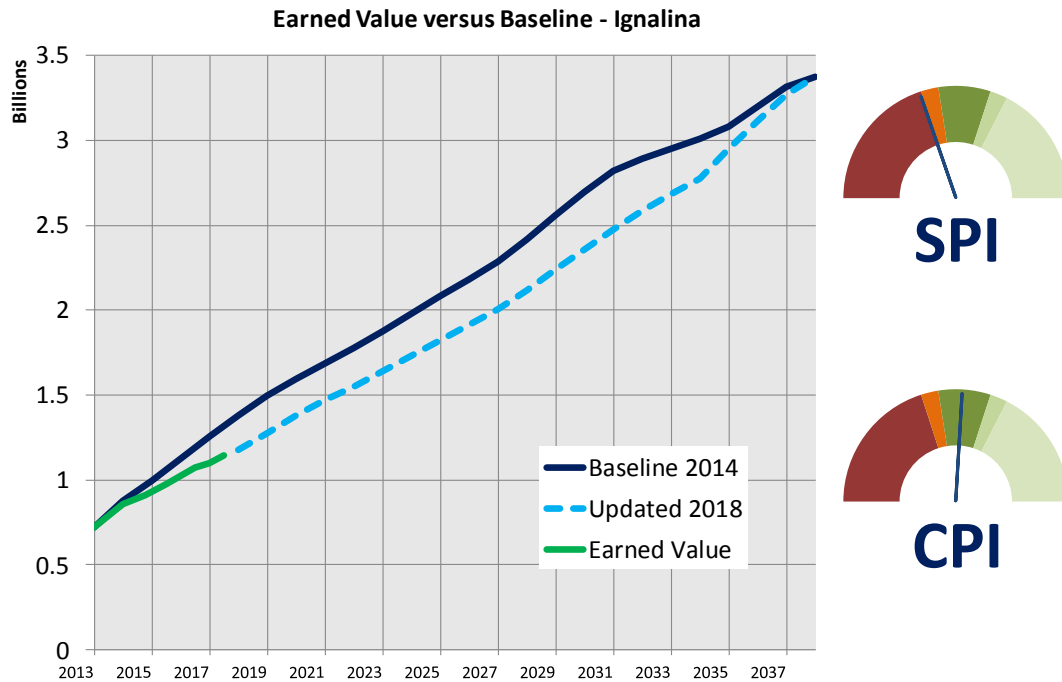


Figure 6 Programme progress and performance measured through earned value. The plotted values include contingencies. The overall cost estimate (including contingencies) is EUR 3377 million in 2018, as in 2014.

The mid-term evaluation report confirmed that the Ignalina programme does not need additional funding in the 2014-2020 period, and identified the needs for the period until 2038 in order to tackle the dismantling of the reactors, in particular the graphite cores. This is the next major step towards enhancing nuclear safety on the Ignalina site.

4.4 Energy sector projects

In the current MFF, the assistance programme does not provide new financial support for mitigation measures in the energy sector; however, until 2013, the assistance programmes had funds allocated to projects in the energy sector in line with the respective accession treaties and national energy policies.

Overall, forty projects are completed by now, worth of 75% of the allocated funds. At this stage, the Commission considered it appropriate to launch an ex-post study on the results and impacts, efficiency, effectiveness and EU added-value of those projects. The conclusions will be published in 2019.

5 CONCLUSIONS

In line with the expectations set for the current MFF, Bulgaria, Lithuania and Slovakia continued making effective and efficient progress in decommissioning their reactors in 2018. The management system has increasingly proven to cope with challenges and setbacks due to the complexity of the programmes.

The preparation and endorsement of the respective decommissioning plans in 2014 was a major milestone and defined the limits of the assistance programmes, with the financing needs to achieve the decommissioning end state eventually established. At the mid-term stage, these needs were confirmed for the Bohunice and the Ignalina

programmes; for the Kozloduy programme, the due revision of the decommissioning plan resulted in an increase in cost estimates post-2020. The increase of estimates did not result in an equal increase of the programme's envelope since Bulgaria committed to cover the increase to a large extent.

The mid-term evaluation report thus confirmed that no additional funding is needed in the current MFF (2014-2020) to achieve the objectives stated in the respective Council regulations and that the programmes should be continued after 2020.

National contribution levels are currently not established in the legal basis, which creates residual uncertainties. Appropriate national, relative to EU, contributions and defining a clear and formalised framework for 'co-financing' is expected to encourage greater national ownership and economy-seeking on the part of beneficiaries.

The progress accomplished so far assures that greatly improved safety levels will be achieved at the sites as a result of EU funding in this MFF. Knowledge sharing amongst the three beneficiaries has positively impacted the programmes and contributed to the latest successes. Building on that, the Commission has fostered a step up for the creation of actual synergies: for example the decontamination of the primary circuits of the Kozloduy units is going to be carried out by employing the equipment acquired under the Bohunice programme and benefitting of JAVYS' know-how (see point 4.2).

In the next period major expected developments in the field include:

- in Bulgaria: the steady progress of construction of the National Disposal Facility, the management of legacy waste and the start of major D&D works in the reactor building;
- in Slovakia: the final dismantling of the reactor cores;
- in Lithuania: the steady progress of defueling and the preparations for dismantling the irradiated graphite core, which is a first of a kind project of an unprecedented scale.