**NUCLEAR DECOMMISSIONING (BG AND SK)**

**NUCLEAR DECOMMISSIONING ASSISTANCE PROGRAMMES IN BULGARIA AND SLOVAKIA**

**What is nuclear decommissioning in Bulgaria and Slovakia?**

In accordance with their respective Acts of Accession to the Union, Bulgaria and Slovakia anticipated the shutdown of six Soviet-designed, first-generation nuclear power plants. The EU committed to provide financial support for their decommissioning. The nuclear decommissioning assistance programmes were established to assist the two Member States implement the decommissioning of Kozloduy units 1 to 4 (Bulgaria) and Bohunice V1 units 1 and 2 (Slovakia) in accordance with their respective decommissioning plans, while maintaining the highest level of safety.

**Budget implementation (in million EUR)**

<table>
<thead>
<tr>
<th>EXECUTED COMMITMENTS</th>
<th>EXECUTED PAYMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75.5</td>
<td>74.9</td>
</tr>
<tr>
<td>77.0</td>
<td>62.2</td>
</tr>
<tr>
<td>78.5</td>
<td>37.9</td>
</tr>
</tbody>
</table>

**LEGAL BASIS 2014-2020**

Council Regulation (Euratom) No 1368/2013

**MORE INFORMATION**

https://europa.eu/!bC66CU

**BUDGET ALLOCATION 2014-2020**

EUR 518.4 million

**OVERALL EXECUTION (2014-2020)**

100%

51%

**specific objectives**

- **Kozloduy.** Performing dismantling in the turbine halls of units 1 to 4 and in auxiliary buildings.
- **Kozloduy.** Dismantling of large components and equipment in the reactor buildings of units 1 to 4.
- **Kozloduy.** Safely managing the decommissioning waste in accordance with a detailed waste management plan.
- **Bohunice.** Performing dismantling in the turbine hall and auxiliary buildings of reactor V1.
- **Bohunice.** Dismantling of large components and equipment in the reactor V1 buildings.
- **Bohunice.** Safely managing the decommissioning waste in accordance with a detailed waste management plan.

**Why is it necessary?**

Due to the early closure of their plants, it was not possible for Bulgaria and Slovakia to accumulate sufficient funds from operation of the plants. It is therefore in the interest of the EU to provide financial support for the seamless continuation of decommissioning in order to progress towards the decommissioning end state, in accordance with approved plans, while keeping the highest level of safety. This will contribute to providing substantial and sustained support for the health of workers and the general public, preventing environmental degradation and providing for real progress in nuclear safety and security.

**Outlook for the 2021-2027 period**

Council Regulation (Euratom) 2021/100 established the continuation of the Kozloduy and Bohunice programmes for the 2021-2027 period.

The implementation of the decommissioning plans will continue under the multiannual financial framework for 2021-2027 subject to a maximum EU co-financing of 50%.

During the 2014-2020 multiannual financial framework, the Joint Research Centre decommissioning programme was financed under a separate instrument. For the new period, it has been incorporated into this programme.

The Joint Research Centre will lead the effort to disseminate knowledge on the decommissioning process to all EU Member States.
Concrete examples of achievements

<table>
<thead>
<tr>
<th>Baseline</th>
<th>PROGRESS TO TARGET</th>
<th>Target</th>
<th>Results</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kozloduy – metal from dismantling in reactor buildings (in tonnes)</td>
<td>79%</td>
<td>1 200</td>
<td>948 out of 1 200</td>
<td>Moderate progress</td>
</tr>
<tr>
<td>Kozloduy – quantity and type of safely conditioned waste (in tonnes)</td>
<td>90%</td>
<td>43 860</td>
<td>39 320 out of 43 860</td>
<td>Moderate progress</td>
</tr>
<tr>
<td>Bohunice – quantity and type of safely conditioned waste (in tonnes)</td>
<td>90%</td>
<td>149 297</td>
<td>134 124 out of 149 297</td>
<td>Moderate progress</td>
</tr>
</tbody>
</table>

Where are we in the implementation?

- In total, EUR 518 million was allocated in commitments for the 2014-2020 period, representing 100% of the appropriations available for the period.
- Decommissioning projects are, in many cases, highly complex from the procurement and implementation point of view and extend over a long period of time. This explains the inherent interval between the commitments and the payments of the programme, and why most of the payments during the 2014-2020 period were related to commitments from 2007-2013, with a payment implementation rate of 51% of the 2014-2020 allocated budget.
- Nevertheless, when including the payments related to the 2007-2013 multiannual financial framework commitments, the payments made during 2014-2020 represented 162% of the committed amount for the same period.
- Bulgaria and Slovakia continued to make effective progress in decommissioning their nuclear power plants in 2020. Dismantling activities are ongoing and the recovered materials are being recycled or treated as radioactive waste. The cost of the work carried out since 2014 is within budget.
- Progress at these two sites was affected by the COVID-19 crisis, which meant limited access by foreign experts and contractors. Measures to ensure that activities could continue safely significantly reduced the short-term impact on project milestones.

Performance assessment

- The overall progress towards the nuclear decommissioning objectives is satisfactory, although delays are accumulating in specific areas of the implementation.
- The decommissioning of the Kozloduy power plant in Bulgaria has made significant progress, including the following:
  - The dismantling of equipment in the turbine hall, a major milestone of the first specific objective, was completed in 2019, a year earlier than scheduled.
  - The plasma melting facility, a first-of-its-kind facility for the high-performance volume reduction of radioactive waste, demonstrated that it could reduce the volume of radioactive waste by a factor of 50.
  - On the other hand, the dismantling of large components in the reactor building and the management of the decommissioning waste remain behind schedule due to a delay in obtaining the approval of the nuclear regulator, and the impact of COVID-19 in 2020.
- The Bohunice programme in Slovakia is the most advanced of the three decommissioning programmes assisted by the EU, and it will be the first completed decommissioning programme for its type of reactor:
  - The dismantling of the large components of the reactor coolant system has started, including the transportation of the reactor pressure vessel and other activated components to pools reconfigured as underwater cutting workshops in 2020.
  - The 12 steam generators, which are each made of 145 tonnes of steel, were transferred to the former turbine hall in 2019 and the cutting of the first steam generator was completed in June 2020.
  - On the other hand, the slowdown of the conventional waste production due to the impact of COVID-19 and of the lower-than-planned quantity of material to be removed from the site, led to 89% of the target being achieved by the end of 2020.
- During the 2014-2020 multiannual financial framework, the Kozloduy and Bohunice programme progressed steadily towards the decommissioning end state, in accordance with their respective decommissioning plans, whilst maintaining the highest level of safety. The process will continue under the multiannual financial framework for 2021-2027 and a new objective will be pursued: the dissemination of knowledge on the decommissioning process to all EU Member States.
- Technical challenges, which are intrinsic to the decommissioning process, slow regulatory approval and the fact that the decommissioning market is still in a developmental stage have led to delays, which could not be caught up with in 2020 due to the impact of the COVID-19 pandemic. After the midterm evaluation in 2018 the time schedule for the activities was revised, in order to better monitor the progress and performance according to up-to-date figures.
- However, the critical path of the programmes is monitored with the highest level of attention. When risks are identified, mitigating actions like the parallel execution of tasks or working in several shifts are proposed.

Concrete examples of achievements

<table>
<thead>
<tr>
<th>29 448</th>
<th>134 124</th>
<th>392</th>
</tr>
</thead>
<tbody>
<tr>
<td>tonnes of metals were originated from the dismantling of the turbine hall in the Kozloduy programme by the end of 2020.</td>
<td>tonnes of conventional recyclable material were dismantled by the end of 2020 in the Bohunice programme. This material was transported to the recycling facilities outside the Bohunice decommissioning site.</td>
<td>reinforced-concrete containers of radioactive waste were produced in the Kozloduy programme by the end of 2020. The production of final waste packages (i.e. reinforced-concrete containers) for legacy waste and decommissioning waste was 106% of the target by this date.</td>
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