NUCLEAR ENERGY

The nuclear power currently produced is released by a process called nuclear fission, which involves splitting the nuclei of uranium and plutonium to release energy. Nuclear energy is a low-carbon alternative to fossil fuels and represents a critical component in the energy mix of 13 of the 27 EU Member States, accounting for almost 26% of the electricity produced in the EU. However, in the aftermath of the 1986 Chernobyl disaster and the 2011 nuclear catastrophe in Fukushima, Japan, nuclear energy has become highly controversial. Germany’s decision to phase out nuclear energy by 2020, as well as the temporary closure of two Belgian reactors after the discovery of cracks in their vessels, has stepped up pressure for the abandonment of nuclear power in Europe. While it is the Member States that choose whether to include nuclear power in their energy mix or not, EU legislation aims at improving the safety standards of nuclear power stations and ensuring that nuclear waste is safely disposed of and handled.

LEGAL BASIS

Treaty establishing the European Atomic Energy Community (Euratom Treaty), Articles 40-52 (investment, joint undertakings and supplies) and 92-99 (nuclear common market).

OBJECTIVES

To tackle the general shortage of ‘conventional’ energy in the 1950s, the six founding Member States looked to nuclear energy as a means of achieving energy independence. Since the costs of investing in nuclear energy could not be met by individual countries, the founding Member States joined together to form the European Atomic Energy Community. The general objectives of the Euratom Treaty are to contribute to the formation and development of Europe’s nuclear industries, so that all Member States can benefit from the development of atomic energy, and to ensure security of supply. At the same time, the Treaty guarantees high safety standards for the public and prevents nuclear materials intended principally for civilian use from being diverted to military use. Euratom’s powers are limited to peaceful civil uses of nuclear energy. Current legislation aims at safeguarding high safety standards.
ACHIEVEMENTS

A. Nuclear safety

Nuclear safety deals with the safe operation of nuclear installations, complemented by radiation protection and radioactive waste management. The EU promotes the highest safety standards for all types of civilian nuclear activity, including power generation, research and medical use. Member States are required to establish national frameworks with regard to nuclear safety requirements, the licensing of nuclear power plants, supervision and enforcement.

Following the Fukushima nuclear accident, the Commission carried out a comprehensive risk and safety assessment of all EU nuclear power plants to assess the safety and robustness of nuclear installations in the event of extreme natural events. The Commission gave an overall positive assessment of current European safety standards, but highlighted the need for further upgrades in order to ensure better consistency among Member States and to catch up with international best practices (COM(2012)0571). In 2014, EU-wide safety rules for nuclear installations were therefore updated (Directive 2014/87/Euratom). In February 2015, the Commission proposed that the information requirements under Article 41 and 44 of the Euratom Treaty be reviewed to align them with the new policy developments. In addition, the notification requirements need to be clearer for investors and the notification process itself should be made more efficient. The Commission announced in its latest roadmap on Energy Union that the plans will be published in 2018 (COM(2017)0688).

1. Radiation protection

Exposure to ionising radiation represents a significant danger for human health (both for the general public and for workers in the medical, industrial and nuclear sectors) and for the environment. In order to reflect scientific progress, to improve legal consistency and to address the issues of natural radiation sources and protection of the environment, the patchwork of EU legislation in the area of radiation protection was updated and simplified. Council Directive 2013/59/Euratom of 5 December 2013 laid down basic safety standards for protection against the dangers arising from exposure to ionising radiation[1]. This simplifies European legislation by replacing five directives, and introduces binding requirements for protection against indoor radon, use of building materials and an environmental impact assessment of discharges of radioactive effluents from nuclear installations. A separate directive, Directive 2013/51/Euratom of 22 October 2013[2], focuses on monitoring radioactive substances in water intended for human consumption.

Several regulations have laid down conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power station (Regulation 733/2008/EC, extended by Regulation 1048/2009/EC, Regulation 1635/2006/EC and Regulation 1609/2000). Regulation 2016/52/EC lays

down maximum permitted levels of radioactive contamination of food and feed following a nuclear accident or any other case of radiological emergency.

2. Transport of radioactive substances and waste

Regulation 1493/93/EC of 8 June 1993 introduced a Community system for declaring shipments of radioactive substances between Member States, to ensure that the relevant authorities receive the same level of information concerning radiation protection as they did before 1993 when border controls were still in place.

A system of prior authorisation for shipments of radioactive waste was established in the EU in 1992 and modified significantly in 2006. Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel aims to guarantee an adequate level of public protection from such shipments. It lays down and lists a number of strict criteria, definitions and procedures that need to be applied when transporting radioactive waste and spent fuel for intra- and extra-Community shipments.

3. Waste management

An EU legal framework for waste management in Europe was created in 2011 with the adoption of Council Directive 2011/70/Euratom on the management of radioactive waste and spent fuel. It provides for close monitoring of national programmes for the construction and management of final repositories, as well as legally binding safety standards. Member States established their first national programmes in 2015 and every three years submit national reports on the implementation of the directive.

4. Decommissioning

The decommissioning of a nuclear facility is the final phase in its lifecycle. It involves activities ranging from shutdown and removal of nuclear material to site restoration and complete elimination of radiological hazards, and is ultimately the responsibility of Member States. At the time of their accession to the EU, Bulgaria, Lithuania and Slovakia agreed to shut down their first-generation, Soviet-designed nuclear reactors. In order to fulfill the accession agreements, the EU launched nuclear decommissioning assistance programmes to co-finance the safe removal of radioactive materials and mitigate electricity generation and employment issues. Lately, these programmes have focused on the safety challenges of decommissioning. The Commission has proposed continued support for these programmes in the period 2021-2027.

B. Safeguarding nuclear materials

A number of regulations have been adopted over time and amended in order to establish a system of safeguards ensuring that nuclear materials are used only for the purposes declared by their users and that international obligations are complied with, e.g. Commission Regulation (Euratom) 302/2005. These safeguards cover the entire nuclear fuel cycle, from the extraction of nuclear materials in the Member States, or their importation from third countries, to exportation outside the EU. The Commission is responsible for controlling civil nuclear material within the EU.
C. Nuclear research, training activities and information

Nuclear research in Europe is funded through multiannual framework programmes. The Euratom programme for nuclear research and training activities complements, but remains separate from, Horizon 2020, the EU framework programme for research and innovation. The amount dedicated to the Euratom programme for the 2014-2018 period is EUR 1 608 million, divided among three specific programmes: one covering indirect actions in fusion energy research (EUR 728 million), one on nuclear fission and radiation protection (EUR 315 million), and one covering direct actions undertaken by the Commission’s Joint Research Centre (JRC) (EUR 559 million). In the field of nuclear fission energy, a Sustainable Nuclear Energy Technology Platform was established in 2007 in order to better coordinate research and development, as well as demonstration and deployment. In the area of fusion energy, the EU is a founding member and main financial partner of ITER, an international nuclear fusion research and engineering project, which is currently building the world’s largest experimental nuclear fusion reactor in Cadarache, France. A Joint Undertaking for ITER and the Development of Fusion Energy has been established in order to promote scientific research and technological development in the field of fusion (Council Decision 2007/198/Euratom). Its members are Euratom (represented by the Commission), the EU Member States and certain third countries which have concluded cooperation agreements with Euratom.


ROLE OF THE EUROPEAN PARLIAMENT

Parliament’s role in the decision-making process under the Euratom Treaty is limited since it has only consultation powers and its opinion is not binding. Nevertheless, in its various resolutions on the topic, it has consistently put emphasis on the need to clarify the distribution of responsibilities between EU institutions and Member States and strengthen the EU common framework on various aspects of nuclear installations, as well as on the importance of improving safety and environmental protection requirements. In its resolution of July 2011 on energy infrastructure priorities for 2020 and beyond,[3] Parliament strongly supported the Commission’s decision to introduce stress tests for European nuclear power plants. A supplementary resolution was adopted in plenary in March 2013, pointing out the limits of the ‘stress tests’ exercise carried out by the Commission in 2012 and asking for the inclusion in future tests of additional criteria, notably in relation to material deterioration, human error, and flaws in reactor vessels. Parliament urged full implementation of the safety improvements.[4]

In its first-reading position of June 2011 on the proposed Council directive on the management of spent fuel and radioactive waste,[5] Parliament supported the

---

Commission’s proposal for a complete ban on the export of radioactive waste, while the Council was in favour of allowing exports under very strict conditions. Parliament also asked for it to be further specified that the directive relates to environmental protection and for sufficient provisions to ensure public information on and participation in waste management.

In its first-reading position of March 2013 on the proposal for a Council directive on monitoring radioactive substances in water intended for human consumption[6], Parliament requested a change of legal basis (from Article 31 and 32 of the Euratom Treaty to Article 192 of the Treaty on the Functioning of the European Union (TFEU)) and, as a consequence, the following of the ordinary legislative procedure. Parliament proposed additional provisions on improved information for consumers, random water quality checks, and differentiated management of natural radiation levels and contamination from human activities. It also clarified the duties of Member States and of the Commission.

In its first-reading position of October 2013 on the proposal for a Council directive updating the basic safety standards for protection against ionising radiation[7], Parliament again called for a change of legal basis, from the Euratom Treaty to the TFEU. It extended the scope of the directive to any planned, existing, accidental or emergency radiation exposure, made stricter the dosage limits for which exposure is allowed, and strengthened penalties and reparation for damages. It also improved the system for informing the public.

In its first-reading position on the Euratom Directive establishing the Community framework for the nuclear safety of nuclear installations (Directive 2014/87/Euratom amending Directive 2009/71/Euratom), Parliament called on the Member States for more transparent communication in relation to safety of nuclear installations and related risks. Parliament also proposed that peer reviews should take place every eight years instead of every ten years, and that Parliament should be informed of the results, the related measures and the plans. These provisions were not incorporated by the Council in the final text of Directive 2014/87/Euratom.

Matteo Ciucci
11/2020