

Every dollar spent on nuclear energy is one less dollar spent on clean renewable energy and another dollar spent on making the world a relatively dirtier and more dangerous place, as nuclear energy and nuclear weapons go hand in hand.

This view has been gaining in popularity in recent decades as environmental concerns become crucial and the consequences of nuclear power accidents have a significant impact on the regulation of nuclear energy, human health and, in general, our planet. Many countries have decided to close down nuclear power plants and replace them with plants that use other energy sources, especially renewable energy sources.

### **Nuclear energy in Slovenia**

Nuclear energy is regulated by the Law on Ionizing Radiation Protection and Nuclear Safety, which transposes several EU directives related to nuclear energy management and safety measures.

The only Slovenian nuclear power plant, Krško (NPP), started operating in 1984 and produces up to 6,000 GWh of electricity annually, half of which is transported to the Slovenian grid and represents one fifth of Slovenia's electricity consumption.

In terms of the environment, the Krško NPP is in line with environmental standards as well as with CO<sub>2</sub> emission standards, with savings of about 5 million tonnes of CO<sub>2</sub> emissions per year compared to other power plants.

The issue of decommissioning of the Krško Nuclear Power Plant was raised in the 1990s, with the Law on the Fund for Financing the Decommissioning of the Krško Nuclear Power Plant and the disposal of radioactive waste from the Krško Nuclear Power Plant, which establishes a fund for the financing of the decommissioning, but the law does not end the working life of the Krško Nuclear Power Plant. The law on shutting down the Krško NPP within ten years was proposed in 1995, which was followed by a request for a legislative referendum, which was ultimately not held and the law was not adopted.

Today, the working life of the Krško NPP is determined by a contract concluded in 2003 between the Republic of Slovenia and the Republic of Croatia, two owners of the Krško NPP. According to Article 5, the life span of a nuclear power plant will expire in 2023. This deadline may be extended. This is included in the Resolution on the National Program for the Management of Radioactive Waste and Spent Nuclear Fuel 2016-2025, adopted by the Slovenian National Assembly, under which the work of the Krško NPP can be extended until 2043 in the event of a successful periodic safety review between 2023 and 2033. years.

If we look at Slovenian nuclear policy, a few years after the construction of the Krško NPP, the Law on the Prohibition of the Construction of any New Nuclear Power Plant on the

Territory of the Socialist Federal Republic of Yugoslavia was adopted. This ban was in force after Slovenia's declaration of independence from 1991 to 2008, when it was lifted, and in recent years media reports have emerged about the construction of a new nuclear power plant in Slovenia, which could be located near the existing one.

### **Regulation of nuclear energy in the EU**

Nuclear power plants produce almost 30% of the EU's electricity. The European Union regulates nuclear energy with the Euroatom Treaty, which regulates nuclear energy management and then through several directives regulating nuclear safety, decommissioning of nuclear power plants, radioactive waste and radiation protection. The European Commission is actively involved in assistance programs for the decommissioning of certain nuclear power plants. This is (i) the Ignalina nuclear power plant in Lithuania, where security measures are implemented in accordance with Council Regulation (Euratom) No. 1369/2013 of 13 December 2013 and (ii) Kozloduy Nuclear Power Plant in Bulgaria and Bohunice in Slovakia, where nuclear decommissioning assistance programs are regulated by Council Regulation (Euratom) No 1369/2013. 1368/2013 of 13 December 2013.

Although the EU strongly regulates this area, it still gives the Member States discretion to decide on the decommissioning of nuclear energy. Currently, EU Member States are implementing different policies regarding nuclear energy. For example, Portugal, Ireland, Italy, Poland, Austria, Croatia, the Baltic States and Greece do not have any operational nuclear power plants, and several other countries, such as Germany and Belgium, implement nuclear energy programs.

On the other hand, the construction of nuclear power plants is currently taking place in only three EU Member States - Finland, France and Slovakia. France, as the EU country with the largest number of nuclear power plants - 58, adopted in January 2019 a program that includes the decommissioning of several nuclear power plants in the coming years and a reduction in nuclear power production to 50% of total electricity supply by 2035. Although initially the deadline for reaching the target was set in 2025, it was extended due to its high dependence on nuclear energy, since nuclear energy covers about 75% of France's electricity consumption.

### **Impacts and decommissioning of nuclear energy**

Looking at the global picture, the WEO scenario expects about \$ 1.1 trillion in nuclear energy investment by 2040. However, this growth is expected to be concentrated in China

and India (93% of total investment), while the rest of the world continues to shut down its nuclear power plants. One aspect of the environmental benefit of nuclear energy is definitely the fact that nuclear power plants do not produce CO<sub>2</sub> during energy production and, therefore, do not contribute to global warming.

However, this does not necessarily imply that nuclear energy is safe. On the contrary, it is considered very dangerous for human health due to its radioactivity. The Fukushima and Chernobyl accidents, most importantly, had a major impact on population health and the environment: in the Chernobyl case, dozens died, the population was evacuated, the possibility of cancer was very high in the environment, and security measures were taken in several European countries. In the case of Fukushima, people who lived nearby were evacuated, and in fear of future similar events, several countries, such as Germany, Switzerland, Belgium, Taiwan and South Korea, announced their intention to finally abolish nuclear power, currently implemented only by Germany, which has decided to shut down all its nuclear power plants by 2022.

The closure of nuclear power plants opens up space for the use of renewable energy sources, which are the first choice, since they do not involve radioactivity or CO<sub>2</sub> emissions. However, wind farms need up to 360 times the surface area to produce the same amount of electricity as a nuclear power plant, and solar plants need up to 75 times the land area, according to the Nuclear Energy Institute, with the fact that solar power plants produce significantly more waste and that their working life is shorter than nuclear power plants. Concerns are growing especially with the waste of solar panels made from lead, cadmium and other toxic chemicals, which are non-recyclable and, in most cases, much less regulated than nuclear waste. The same goes for wind farms.

Such waste is only partially regulated by Directive 2012/19 / EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE), which regulates the collection and recycling of photovoltaic panels used in photovoltaic plants in the European union.

Nuclear power plants are also less frequently replaced by non-renewable energy sources, such as thermal power plants or similar sources, which can damage the environment - as in the US, where a shutdown of a nuclear power plant replaced a natural gas plant, which resulted in increasing CO<sub>2</sub> and other emissions from the energy sector.

It is true that shutting down nuclear reactors reduces the risk of major nuclear accidents and, in the case of early shutdown, also the amount of radioactive waste produced during their operation. However, the decommissioning of nuclear power plants for the benefit of the environment alone does not mean that other sources of energy, and especially

renewable energy sources, do not cause any or much less environmental damage. Although most environmental concerns are related to the environmental impacts of nuclear energy, the use of renewable energy has shown that governments should also consider the negative environmental impacts of green energy, since it is not as green as commonly thought. While the percentage of shut down nuclear power plants outweighs the percentage of new ones and more and more countries are opting to exclude nuclear energy as their source of energy, it remains one of the most efficient and acceptable forms of energy production we currently know.