

Nuclear energy: The saviour of energy security?

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The Russian invasion of Ukraine has triggered a global energy crisis as the world scrambles to find reliable energy sources other than oil, bringing nuclear energy into the spotlight once again. Previously, the European Union included nuclear energy in the EU Taxonomy. Will this highly controversial energy source play a more important role in future energy mixes?

Nuclear is already one of the largest non-fossil fuel single sources of energy globally and under the International Energy Agency's Net Zero by 2050 global roadmap its proportion of the energy mix will rise over the coming decades from 5% in 2020 to 11% by 2050. However, this is a scenario based on an ambitious plan rather than a forecast.

China and India could build over 100 nuclear power plants

In the face of geopolitical instability, it is necessary for Europe to figure out long-term solutions to eliminate their dependence on Russian energy. One option is to increase nuclear energy usage. In July 2022, the European Parliament rejected a motion opposing the inclusion of nuclear and natural gas as environmentally sustainable activities. Developed by the EU, the EU taxonomy is a classification system that sets out a list of environmentally sustainable economic activities, providing companies, investors and policymakers with definitions of which economic activities can be considered environmentally sustainable.

In spite of this, the future development of nuclear energy will concentrate more closely on regions outside of Europe. In many developed economies, there has been a push to extend the lifecycle of reactors beyond the length of time they were originally designed for (typically 40 years) instead of building new plants. On the flip side, the main expansion of nuclear power is therefore expected to be in the Asia-Pacific region, which looks set to account for two-thirds of additional units over the coming years. China and India alone are expected to operate over 140 nuclear power reactors according to some sources.

Currently, there are more than 400 nuclear power plants around the world generating 367 gigawatts (GW) of power. Between 2025 and 2040, many existing plants will reach the end of their planned lifetimes and will need to be decommissioned. Although more than 100 plants globally are under construction or in the planning stage, current progress puts the world's expected nuclear capacity at only 582 GW for 2040, far below the 2050 net zero target of 730 GW.

Highly controversial: The dilemma of nuclear energy

Increasing the use of nuclear power will help the global transition to low carbon energy while also addressing the current energy crisis. However, nuclear power has always been a controversial energy choice. Proponents suggest that it is an extremely low carbon and reliable source of baseload energy source. In addition to this, the price of nuclear energy is relatively stable. In terms of safety, there is no scientific evidence that nuclear power poses a significant threat to human health under normal operations, as long as the generated waste is properly monitored.

However, opponents of nuclear energy argue that even if chances are low, the occurrence of a nuclear accident

would have serious consequences for humans and the environment. Radioactive waste also has a very long lifespan and can be difficult to store safely. Additionally, nuclear energy is powered by splitting uranium atoms, and the process of mining uranium can have a negative impact on the environment.

In short, views about nuclear energy as a green energy source will be less divergent and it is expected to play a prominent role in keeping a secured global energy supply. Nevertheless, doubts and concerns about the safety of nuclear energy are here to stay and will continue to be controversial.

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