

Marsh Specialty

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Nuclear power and climate change



It is becoming increasingly clear that a robust nuclear generating fleet has an important role in helping societies meet the goals of the Paris Agreement and the 2030 Agenda for Sustainable Development. Nuclear power plants generate baseload electricity on a highly reliable basis and virtually without operational emission of greenhouse gasses. A recent study¹ by the United Nations Economic Commission for Europe concluded that the employment of nuclear power has prevented the production of some 74 gigatons of carbon dioxide.

Though over a dozen countries have explicitly stated that nuclear power will play a role in their greenhouse gas reduction efforts, more than seventy nuclear power plants have been shuttered since 2000 — some largely for political reasons, ten of which were shut in 2021.² This lost capacity has generally been replaced — at least partially — by fossil-fueled generation, representing a setback for climate control efforts. The International Atomic Energy Agency views preventing the closure of additional plants as an urgent priority in addressing climate change.³

There is reason for optimism among nuclear energy supporters as we look ahead. Around the world, more than fifty reactors⁴ are currently being built, with modular construction approaches helping to streamline the process. In China, the recently completed Haiyang nuclear power plant has been modified to allow waste heat from the facility to be used for local district heating, and is being further adapted to support water desalination. In the United States, the *Infrastructure and Jobs Act* included US\$6 billion in funding to prevent the premature closing of active nuclear plants. In addition, four US nuclear plants have been selected to demonstrate hydrogen production projects employing competing methodologies, and the Diablo Canyon nuclear plant has successfully implemented the use of nuclear energy for large-scale desalination.



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Around the world, more than forty enterprises are vying to develop the first mass produced small modular reactor (SMR).⁵ These self-contained reactors will be ideal for employment in remote locations or for dedicated energy intensive applications, including desalination, aluminum smelting, amongst others. We have also seen the development of floating nuclear power plants which provide reliable power even in the face of earthquakes that would disable land-based generating facilities.

Although there are those who would suggest that nuclear power has run its course, there is a strong argument to be made that as a clean energy source, it may be an important component in supporting global efforts at decarbonization and helping to arrest the impacts of climate change.

As well as maintaining the existing fleet, new capacity will need to be built. Given the scale of complexes, construction periods are significant and can take up to 10 years. Where projects are private sector funded, there are often complex debt structures based on the project's future expected earnings. As a result, lenders may insist project owners take out delay in start-up (DSU) insurance⁶ to help mitigate the financial risk of a possible project delay.

1| <https://unece.org/climate-change/press/international-climate-objectives-will-not-be-met-if-nuclear-power-excluded>

2| <https://www.iaea.org/newscenter/news/amid-global-crises-nuclear-power-provides-energy-security-with-increased-electricity-generation-in-2021>

3| <https://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx#:~:text=Power%20reactors%20under%20construction%20%20%20Start,%20%20700%20%2041%20more%20rows%20>

4| <https://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx#:~:text=Today%20there%20are%20about%2044%20nuclear%20power%20reactors,China%2C%20India%2C%20Russia%20and%20the%20United%20Arab%20Emirates.>

5| <https://www.iaea.org/topics/small-modular-reactors>

6| DSU protects project owners against financial consequences (loss of revenue) suffered following damage to the contract works that causes a delay in completion.

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