

English (/topics/nuclear-power-and-climate-change) العربية (/ar/almawadie/alquaa-alnawawiat-wtghyur-almunakh) 中文 (/zh/zhu-ti/he-dian-he-qi-hou-bian-hua-tuo-tan)

Français (/fr/themes/energie-nucleaire-et-changement-climatique-decarbonation) Русский (/ru/temy/yadernaya-energetika-i-izmenenie-klimata-dekarbonizaciya)

Español (/es/temas/energia-nucleoelectrica-y-cambio-climatico-descarbonizacion)



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Nuclear power and climate change: Decarbonization

(/topics/nuclear-power-and-climate-change)

< Energy (/topics/energy)

Related pages

- > Climate change (/topics/climate-change)
- > Sustainable Development Goals (SDGs) (/about/overview/sustainable-development-goals)
- > Sustainable Development Goal 7: Affordable and clean energy (/about/overview/sustainable-development-goals/goal-7-affordable-and-clean-energy)
- > Department of Nuclear Energy (/about/organizational-structure/departament-of-nuclear-energy)
- > Department of Nuclear Sciences and Applications (/about/organizational-structure/departament-of-nuclear-sciences-and-applications)
- > Department of Technical Cooperation (/about/organizational-structure/departament-of-technical-cooperation)

With the adoption of the Paris Agreement in 2015, almost all Parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to prepare nationally determined contributions (NDCs) to control GHG emissions and limit the increase of global mean surface temperature by the end of the century to below 2°C relative to pre-industrial levels. Since then, increasing scientific understanding of the significant risks associated with warming of 2°C, along with increasing societal concern, have established the need for more urgent and ambitious action to avoid the worst impacts of climate change, by limiting warming to 1.5°C.

To reach this goal, carbon dioxide (CO₂) emissions from electricity generation must fall to nearly zero by the middle of this century, even as electricity needs worldwide continue to grow and expand in end-uses such as transportation, heating and industrial energy use.

The availability of clean electricity is critical for meeting the Paris Agreement objectives

At least **80%** of mitigation efforts required by 2030 in the energy sector could be concentrated in the power sector

Nuclear power can play a key role in meeting some of the climate pledges

Every third kWh generated worldwide is low carbon; The carbon footprint of electricity generation in 30 nuclear countries is 19% below the global average

Every third low carbon kWh is nuclear

19%

(<https://www.iaea.org/sites/default/files/climate-change-1140x300.jpg>)

Nuclear power is a low-carbon source of energy. In 2018, nuclear power produced about 10 percent of the world's electricity. Together with the expanding renewable energy sources and fuel switching from coal to gas, higher nuclear power production contributed to the levelling of global CO₂ emissions at 33 gigatonnes in 2019^{1/}. Clearly, nuclear power – as a dispatchable low carbon source of electricity – can play a key role in the transition to a clean energy future.

Related resources

- 🔗 How Can Nuclear Replace Coal as Part of the Clean Energy Transition? (<https://www.iaea.org/newscenter/news/can-nuclear-replace-coal-as-part-of-the-clean-energy-transition>)
- 📄 Transitions to low carbon electricity systems: Key economic and investments trends: Changing course in a post-pandemic world (<https://www.iaea.org/sites/default/files/to-low-carbon-electricity-systems-changing-course-in-a-post-pandemic-world.pdf>)
- 🔗 Climate Change and Nuclear Power 2022 (<https://www.iaea.org/topics/nuclear-power-and-climate-change/climate-change-and-nuclear-power-2022>)
- 📄 Climate Change and Nuclear Power 2022: Securing Clean Energy for Climate Resilience (<https://www.iaea.org/sites/default/files/ccnp2022-body-web.pdf>)
- 🔗 Climate Change and Nuclear Power 2020 (<https://www.iaea.org/publications/1-change-and-nuclear-power-2020>)
- 📄 Nuclear Power for Sustainable Development (<https://www.iaea.org/sites/default/files/sustainable-development.pdf>)
- 📄 Nuclear Power and Market Mechanisms under the Paris Agreement (<https://www.iaea.org/sites/default/files/market-mechanisms-under-paris->

As part of the capacity building process for energy system analysis and planning (/topics/energy-planning), the IAEA provides assistance to Member States for the evaluation of the role of nuclear energy in national climate change mitigation strategies through the Technical Cooperation programme (/services/technical-cooperation-programme/about) and Coordinated Research Projects (/services/coordinated-research-activities/how-crps-work). For this purpose, a comprehensive set of IAEA tools and methodologies are available to Member States.

^{1/} Articles on global CO₂ emissions in 2019

In focus



VIDEO
(/newscenter/multimedia/videos/how-can-we-get-carbon-emissions-to-net-zero)

31 March 2021

How Can We Get Carbon Emissions to Net Zero?
(/newscenter/multimedia/videos/how-can-we-get-carbon-emissions-to-net-zero)

News



(/newscenter/news/preparing-the-next-nuclear-generation-7th-annual-session-of-the-intercontinental-nuclear-institute-concludes-with-iaea-support)

07 July 2023

Preparing the Next Nuclear Generation: 7th Annual Session of the Intercontinental Nuclear Institute Concludes, with IAEA Support
(/newscenter/news/preparing-the-next-nuclear-generation-7th-annual-session-of-the-intercontinental-nuclear-institute-concludes-with-iaea-support)



(/newscenter/news/iaea-initiative-advances-efforts-to-support-the-safe-secure-deployment-of-smrs)

28 June 2023

IAEA Initiative Advances Efforts to Support the Safe, Secure Deployment of SMRs
(/newscenter/news/iaea-initiative-advances-efforts-to-support-the-safe-secure-deployment-of-smrs)

agreement.pdf)

- Nuclear Power and the Paris Agreement
(<https://www.iaea.org/sites/default/files/parisagreement.pdf>)
- Interlinkage of Climate, Land, Energy and Water Use (CLEW)
(<https://www.iaea.org/topics/economic-economic-and-environmental-analysis/climate-land-energy-water-strategies>)
- Climate Change and Nuclear Power 2018
(<https://www.iaea.org/publications/1:change-and-nuclear-power-2018>)
- International Conference on Climate Change and the Role of Nuclear Power, 7-11 October 2019
(<https://www.iaea.org/atoms4climate>)
- International Conference on Climate Change and the Role of Nuclear Power: Conference President's Summary, 11 October 2019
(https://www.iaea.org/sites/default/files/10-23_concluding_summary_final.pdf)



(<https://www.iaea.org/topics/nuclear-power-and-climate-change/brochures>)



(/newscenter/statements/iaea-director-generals-statement-to-the-nuclear-harmonization-and-standardization-initiatives-plenary-meeting)

27 June 2023

IAEA Director General's Statement to the Nuclear Harmonization and Standardization Initiative's Plenary Meeting

(/newscenter/statements/iaea-director-generals-statement-to-the-nuclear-harmonization-and-standardization-initiatives-plenary-meeting)



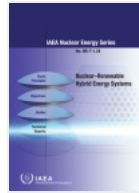
(/newscenter/news/iaea-dg-grossi-in-china-nuclear-energy-safety-and-cooperation)

26 May 2023

IAEA DG Grossi in China: Nuclear Energy, Safety and Cooperation
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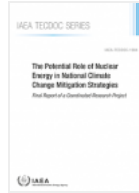
Publications



4 January 2023

Nuclear-Renewable Hybrid Energy Systems

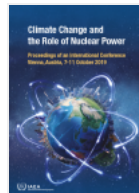
(/publications/15098/nuclear-renewable-hybrid-energy-systems)



29 October 2021

The Potential Role of Nuclear Energy in National Climate Change Mitigation Strategies

(/publications/15001/the-potential-role-of-nuclear-energy-in-national-climate-change-mitigation-strategies)



8 October 2020

Climate Change and the Role of Nuclear Power

(/publications/14763/climate-change-and-the-role-of-nuclear-power)



14 September 2020

Climate Change and Nuclear Power 2020

(/publications/14725/climate-change-and-nuclear-power-2020)

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