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COP26: The Indispensable Role of Nuclear Power

By Julius Cesar Trajano

SYNOPSIS

At COP26, nuclear technology was promoted as “an indispensable tool” for addressing climate change and its harsh impacts. What do nuclear power and technology actually bring to the table?

COMMENTARY

[COP26](#) — the UN Climate Change Conference — in Glasgow, the United Kingdom which ends this Friday (12 Nov 2021) has featured substantive discussions on how nuclear power and technology can help tackle climate change. The peaceful use of nuclear science and technology was strongly represented and articulated through the events organised by the International Atomic Energy Agency (IAEA) at COP26, with the goal of contributing to an informed debate on the benefits of nuclear power and applications.

Nuclear technology was promoted as “an indispensable tool” for achieving a [Net Zero World](#). While tapping nuclear power remains a hotly debated issue, nuclear power and nuclear applications have a lot to contribute to getting global carbon emissions to net zero and boosting climate change adaptation measures. The IAEA Director General Rafael Mariano Grossi said nuclear power should have a “seat at the table” at climate change discussions. What do nuclear energy and technology actually bring to the table?

Nuclear Power for a Low-Carbon Future?

Thirty-two countries operate nuclear power plants, which provide 10% of the world's electricity and more than one quarter of all low-carbon electricity. [The IAEA](#) argued

that the use of nuclear power has prevented the equivalent of around 70 gigatonnes of carbon dioxide emissions over the past 50 years.

It is strongly recommended that nuclear power generation capacity will need to at least double over the next three decades in order to limit the average global temperature increase to well below 2 degrees Celsius as called for by the Paris Agreement, according to the [four model](#) scenarios by the Intergovernmental Panel on Climate Change as well as studies by the International Energy Agency (IEA).

Major [nuclear power producers](#) such as the United States, Russia and China, have all included expanded nuclear power capacity in their national strategies to cut down their CO₂ emissions. In particular, they are all actively developing the emerging technology of advanced and small modular reactors, being touted by the nuclear industry to be more affordable than large conventional nuclear power plants.

Currently, Russia has put into operation a floating modular reactor using this technology. Another nuclear innovation showcased at COP26 is the potential of nuclear hydrogen in decarbonising sectors, such as industry and transport, through the production of low-carbon hydrogen from nuclear power.

Debate Over Nuclear Power Contribution

The contribution of nuclear power plants in reducing greenhouse gas emissions remains debatable for [other experts](#). Nonetheless, as demonstrated in COP26, nuclear energy must not be completely ruled out. For many countries, including those in Southeast Asia that are actively studying this option, it can play a complementary role with other low carbon sources such as renewables.

These innovations and the use of nuclear power should also be seen through climate change-energy security nexus, in which countries deploy nuclear power, not just to reduce their carbon emissions, but also to strengthen their energy security by diversifying their base-load power sources. In this respect, both nuclear power and renewables are complementary in providing low-carbon energy transition.

In Southeast Asia, especially the Philippines, the deployment of small, advanced small reactors are now being explored. This is in the event that they decide to pursue nuclear power electricity generation, in view of their need to diversify their energy sources and attain their low-carbon commitments.

However, there are key concerns associated with nuclear power such as nuclear safety and security issues; the need to update nuclear regulatory, emergency preparedness and response frameworks; the intractable nuclear waste issue; and more importantly, public acceptance to solidify the role of nuclear in addressing climate change.

Several countries in the region have yet to ratify key global nuclear safety and security treaties such as the Convention on Nuclear Safety (CNS) and the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM), although gradual progress in this regard has been seen in the region in recent years.

Nuclear Technology in Climate Adaptation

While ongoing debates on the critical role of nuclear power plants in achieving the goals established in the 2015 Paris Agreement remain unsettled, the peaceful applications of nuclear technology in climate change adaptation have been expanding in recent years.

The nuclear discussions at COP26 demonstrated how governments, farmers and scientists can boost resilience to the impacts of climate change and institutionalise more sustainable management of land and water resources using nuclear science and technology.

For instance, [nuclear and related techniques](#) can boost agricultural resilience to climate change, in reducing greenhouse gas emissions, and in increasing agricultural productivity – altogether known as climate-smart agriculture. In addressing water scarcity caused by the changing climate, a form of nuclear technique known as [isotope hydrology](#) can help countries monitor valuable groundwater resources, supporting decision makers in developing sustainable water use policies.

Such contributions of nuclear technology have been increasingly applied in Southeast Asia. Nuclear technology has helped farmers grow rice that can cope with the diverse effects of climate change. [Recent innovations](#) from Indonesia, Malaysia, the Philippines, Thailand and Vietnam showed how farmers have boosted rice production and planted better crops in harsh climate conditions in the past five years with the help of nuclear techniques.

In the past years, the IAEA and the Food and Agriculture Organisation (FAO) have been helping local scientists use nuclear technology to develop climate-smart agricultural practices and improve water management.

Addressing Fears and Misconceptions

However, there are still challenges to the expansion of the peaceful uses due to misconceptions or concerns about nuclear energy and technology. There is a need to reframe nuclear issues as one that links nuclear technology with climate change adaptation, such as in COP26.

The misconceptions arising from issues of nuclear weapons proliferation, nuclear accidents such as in Fukushima and Chernobyl, and radioactive contamination can be addressed by how much nuclear technology actually help countries achieve several of their commitments to the Paris Agreement.

As demonstrated in COP26, the peaceful uses of nuclear technology cannot be excluded from innovative approaches to addressing the world's most pressing and complex challenge – climate change and its harsh impacts.

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