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Can Nuclear Energy Help Address Climate Change and Energy Insecurity?



Photo Credit: Julius Trajano/NTS Centre

As countries build back better amidst the lingering impact of the pandemic and the war in Ukraine, the role of nuclear energy in helping countries to meet their energy needs and in addressing the 'existential crisis' of climate change has been highlighted. Post-COP26, countries have been attempting to show momentum to do more to decarbonise their economies and ride the green wave so as to attain net-zero emissions. Most recently, we were painfully reminded again how sensitive energy supply and prices are to geopolitical crises, pushing energy security to the forefront of global agenda. The International Atomic Energy Agency (IAEA) claimed that the climate crisis and the energy crisis have prompted more countries to look to nuclear power as part of the solution.

The IAEA has [revised up its annual projections](#) of the potential growth of nuclear power capacity by 2050. In its high case scenario, the Agency now sees global nuclear generating capacity more than doubling to 873 gigawatts (GW) by 2050, compared with current levels of around 390 GW.

The latest IAEA's projections positioned nuclear power as a top low-carbon power source in the world's transition to a more secure, stable and affordable energy future. But for this optimistic scenario to be achieved, a number of challenges need to be addressed, including regulatory and industrial harmonisation, social acceptance and progress in nuclear waste disposal.

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 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 1.5 degrees Celsius. For countries that are vigorously considering more low-carbon energy sources, including those in Southeast Asia that are actively studying this option, nuclear energy must not be completely ruled out as it can play a complementary role with other low-carbon sources such as renewables, creating a hybrid clean energy transition.

Advanced reactors as the future of nuclear energy?

Countries in Northeast Asia and South Asia with existing nuclear

power plants and building new nuclear reactors are expected to ramp up the share of nuclear power in their respective electricity supply mix. Meanwhile, some Southeast Asian countries, such as the Philippines, are carefully contemplating whether to use nuclear power, particularly advanced small modular reactors (SMRs). According to the latest [ASEAN Energy Outlook](#), nuclear energy may be introduced in the region, with 5.2 GW deployed by 2050, or around 1.6% of the power mix in Southeast Asia.

One viable option for Southeast Asian countries is to expand the role of nuclear energy in power generation through the use of advanced SMRs, including floating reactors. These can offer unique advantages (flexibility, cogeneration, hybrid systems with renewables) and will offer lower upfront costs that could widen access to nuclear power. Traditional large-scale nuclear reactors are too expensive to build and advanced small reactor technologies may be an option. Advanced reactors may play a piv-

otal role in meeting climate goals in newcomer countries, which are interested in using nuclear energy for the first time. SMR technology is being developed in several countries such as the United States, South Korea, Russia, and China and may soon be deployed commercially in the coming years.

While advanced reactor technology has been quickly progressing, challenges to introducing SMRs are many. There is a need to assess whether existing global nuclear safety, security and non-proliferation conventions and regimes adequately cover SMRs. In this regard, Asia-Pacific countries should take leadership role in reshaping the governance of nuclear energy as advanced reactors may soon be deployed in the region.

Suggested Readings

- Mely Caballero-Anthony and Julius Cesar Trajano (eds), *Nuclear Governance in the Asia-Pacific* (London and New York: Routledge, 2022).
- IAEA, *Advances in Small Modular Reactor Technology Developments* (Vienna: IAEA, 2020).
- David Santoro and Carl Baker (eds), "Small Modular Reactors: The Next Phase for Nuclear Power in the Indo-Pacific?" *Issues and Insights Edited Volume*, Vol. 22, SR4 (August 2022).
- Julius Cesar Trajano, "Ready for Nuclear Energy?: A Policy Review of the Philippines' Nuclear Energy Plan and Participation in the ASEAN Network of Nuclear Energy Plan and Participation in the ASEAN Network of Regulatory Bodies on Atomic Energy Regulatory Bodies on Atomic Energy," *International Journal of Nuclear Security*, Vol. 7, No.1 (2022).

CLIMATE CHANGE

NEWS & COMMENTARIES

Will a transition to a hydrogen economy affect water security?

The shift to a hydrogen-based economy for most will not negatively impact water security or other water-heavy industries. While hydrogen can gain a significant share of the transportation market, other energy-related sectors will most likely experience a mix of different technologies, which lowers the percentage of water used for hydrogen.

Bart Kolodziejczyk

The World Economic Forum

28 September 2022

Climate change: World aviation agrees 'aspirational' net zero plan

The International Civil Aviation Organisation (ICAO) pledged to support an "aspirational" net zero aviation goal by 2050. The ICAO has now agreed that airlines will use the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Under the scheme airlines would agree a baseline year and all future emissions above the level of that period would have to be offset.

Rowenna Hoskin and Matt McGrath

BBC

8 October 2022

World Bank chief says will keep 'intense' focus on addressing climate change

World Bank President David Malpass recently said that he was keeping an "intense" focus on the bank's efforts to address climate change and was embracing the U.S. Treasury's call to dramatically boost lending capacity to address this and other global problems.

David Lawder

Reuters

8 October 2022

'Not fair': Ghana slams West over low funding for climate change

Ghana's President Nana Akufo-Addo has criticised Western nations for their low financial commitment - US\$55m of the envisioned \$25bn by 2025 - to addressing issues caused by climate change on the African continent.

Al Jazeera and News Agencies

11 October 2022

Rising temperatures could increase risk of new infectious diseases in Singapore: Experts

Researchers found that 218 out of the known 375 human infectious diseases - or 58 per cent - seemed to be made worse by one of 10 types of extreme weather connected to climate change. This includes malaria, monkeypox and Zika.

Vanessa Lim

Channel News Asia

11 October 2022

Indonesia's 2060 net-zero ambition: The challenges ahead

Recent developments in Indonesia's sustainability outlook that includes a net-zero goal by 2060 are pointing to stronger commitments to reducing carbon emissions from energy use. At the same time, short- to medium-term realities, and a lack of public trust may derail the long-term sustainability vision.

Margareth Sembiring

RSIS Commentary

12 October 2022

SELECTED PUBLICATIONS

2022 State of climate services

The transition to clean energy calls for investment in improved weather, water and climate services that can be used to ensure our energy infrastructure is resilient to climate-related shocks. The report illustrates and explains how countries can improve their energy infrastructure, resilience and security through better climate services, supported by sustainable investment.

Geneva: World Meteorological Organization
2022

High temperatures exacerbated by climate change made 2022 Northern Hemisphere soil moisture droughts more likely

Human-caused global warming has made severe droughts like the ones this summer in Europe, North America and China at least 20 times as likely to occur as they would have been more than a century ago.

Dominik L. Schumacher, et al.

World Weather Attribution

2022

EVENTS & ANNOUNCEMENTS

27th Conference of the Parties of the UNFCCC (COP27)

The COP27 seeks to accelerate global climate action through emissions reduction, scaled-up adaptation efforts and enhanced flows of appropriate finance, and recognises that 'just transition' remains a priority for developing countries worldwide.

Sharm El-Sheikh, Egypt

6-18 November 2022

The UN-Water Summit on Groundwater 2022

The Summit aims to bring attention to groundwater at the highest international level. It will use the UN World Water Development Report 2022 as a baseline and the SDG 6 Global Acceleration Framework as a guideline to define actions towards more responsible and sustainable use and protection of this vital natural resource.

Paris, France

7-8 December 2022

ENERGY SECURITY

NEWS AND COMMENTARIES

Climate emergency and food-energy conflicts in Southeast Asia

The article claims that transitions to renewable energy increase competition for land and water usage, potentially undermining agricultural production.

Prapimphan Chiengkul

ISEAS Perspective

20 September 2022

South-east Asia needs \$296b annual investment on renewables: Report

In the long term, average annual investment of US\$210 billion was needed on renewable energy, energy efficiency and to support technologies and infrastructure in the period to 2050 to limit a global temperature rise to 1.5 deg C.

Reuters

The Straits Times

16 September 2022

Renewables grow to meet global electricity demands: Study

Global electricity demand grew by 389 terawatt hours (TWh) in the first half of 2022, while together wind, solar and hydro increased by 416 TWh. This prevented a possible 4% increase in power generation from dirty fossil fuels

Channel News Asia

5 October 2022

Southeast Asian countries need energy diversification as demand seen surging

Energy demand in Southeast Asia countries could triple by 2050 and the region could become a net importer of natural gas and coal if the region do not develop alternative sources of energy.

Fransiska Nangoy and Bernadette Christina

Channel News Asia

6 October 2022

MHI, Hitachi reviving Japan's nuclear power industry

The MHI reactor is touted as meeting the regulatory requirements for "resistance to natural disaster and security against terrorism and unforeseen event."

Scott Foster

The Asian Times

9 October 2022

Possible extension of Germany's nuclear power at risk -econ ministry

Germany had planned to complete a phase-out of nuclear power by the end of this year, but a collapse in energy supplies from Russia because of the war in Ukraine has prompted the government to keep two plants on standby until April 2023. But disagreements within the German cabinet could jeopardize the possible lifespan extension for the Isar II power plant

Reuters

10 October 2022

SELECTED PUBLICATIONS

Examining Southeast Asia's diplomacy on nuclear disarmament and nuclear security: Shared norms and a regional agenda

This article highlights how, beyond advocating for a nuclear-weapon-free world, ASEAN is developing its cooperation on nuclear security, assisted by a network of regional agencies, and how this is enhancing the region's nuclear governance agenda.

Mely Caballero-Anthony and Julius Cesar Trajano

Asian Journal of Peacebuilding, Vol. 10, No. 2

2022

China and the politics of energy demand in the Mekong Region: Responses from Laos and Cambodia

This chapter discusses the responses from the governments of Laos and Cambodia towards Chinese influence in regional energy politics.

Andrea Haefner and Sovinda Po

Chapter 4 in The Displaced: Disrupted Trade, Labour, and Politics in the Mekong River Basin

Tokyo: Konrad-Adenauer-Stiftung Japan

2022

EVENTS & ANNOUNCEMENTS

Call for Papers: Special Issue on Women in Nuclear Security

This is a partnership between the International Journal of Nuclear Security and U.S. National Nuclear Security Administration's Nuclear Security Women. It aims to amplify policy and technical accomplishments and contributions of women working in the nuclear field.

Worldwide

01 November 2022 (deadline for abstracts)

Singapore International Energy Week

SIEW is an annual platform for energy professionals, policymakers and commentators to share best practices and solutions within the global energy space.

Singapore

25-28 October 2022

FOOD SECURITY

NEWS & COMMENTARIES

Indonesia to spend over 6 billion USD to ensure food security in 2023

The Indonesian Finance Ministry is planning on disbursing approximately 95 trillion Rp to encourage food access and quality. The fund is intended to increase land and labour productivity in strategic food commodities, and to promote the utilisation of digital technologies in making farming systems more resilient.

Vietnam News Agency

Vietnam Plus

21 September 2022

China wants to ensure food security by cutting amount of soybeans in animal feed

Over the past year, the (wholesale) price of pork in China has risen by approximately two-thirds. To contain inflation, one measure which China's farm ministry is proposing is for its private sector to reduce the share of imported soybean in the mixes of animal feeds. This can reduce the country's import bill, which was over US\$50 billion last year.

Bloomberg News

22 September 2022

Jordan, Syria, Iraq, Lebanon agree to boost food security cooperation

Agriculture ministers of the four countries approved a proposal by the World Food Programme to establish a regional centre for food security, to be headquartered in Jordan. Partnerships in agricultural marketing are also being explored.

Middle East Monitor

27 September 2022

NIA pushes for 'triple cropping' for food security

The Philippines' National Irrigation Administration (NIA) is encouraging farmers to engage in multi-cropping of irrigation systems within irrigated agricultural lands as a means of improving crop resilience.

Stephanie Sevellano

Philippine News Agency

6 October 2022

Why gains from Ukraine grain deal will not end Middle East's food security crisis

The opening of Ukraine's ports benefits the Middle East in resuming trade of food grains, fertilizers and related products. However, longer-term challenges remain given the rising value of the US dollar, which makes food and fuel imports more expensive.

Jumana Khamis

Arab News

7 October 2022

Ensuring food security in 2023 and beyond

The Philippines' president, who is also its agriculture chief, is pushing for a 40% increase in budgetary support to domestic food production. This is intended to insulate the country from turbulence in food trade amid the Ukraine war, alongside long-term climate change challenges.

Bella Cariaso

The Manila Times

11 October 2022

SELECTED PUBLICATIONS

Cost and affordability of healthy diets across and within countries

The UN FAO has adopted new approaches to measuring the cost of a healthy diet. This background paper presents useful reading for developing a better understanding of how government policies can better support improved nutrition outcomes, globally.

A. Herforth, et al.

FAO Agricultural Development Economics Technical Studies, Series No. 9, Rome: UN FAO.

2022

Barriers and enablers of the use of digital technologies for sustainable agricultural development and food security: Learning from cases in Mali

This article evaluates the efficacy of initiatives for promoting digitalisation in agriculture under different social and institutional conditions, using the case of Mali. It seeks to understand the underlying processes that enable or constrain the take-off and the sustainability of technology adoption.

Amadou Sidibe et al.

Elementa: Science of the Anthropocene, Vol. 9, No.1
2021

EVENTS & ANNOUNCEMENTS

Building Sustainable Food Value Chains in Asia: Sustainable Development Impact Summit

In the face of erratic monsoons, heatwaves and prolonged droughts, this webinar identified practices and policies that hold the greatest promise to ensure more resilient and sustainable food value chains in Japan and the broader Asian region, considering insights from the private sector as well as academia.

Recorded Webinar

6 March 2022

Are healthy diets affordable? Using new data to guide agricultural and food policy

This World Bank-hosted event brought together a panel of experts from countries, international agencies, and academia to discuss new food security indicators on diet costs and affordability as well as their use in guiding agricultural and food policies both globally and domestically.

Recorded Webinar

14 July 2022

HEALTH SECURITY

NEWS & COMMENTARIES

Human development and mental health: New approaches and metrics needed

The latest UN study reiterated the importance of mental wellbeing and psychological resilience in human development and security. A change in approach and metrics is necessary to improve tackling of mental health issues while simultaneously managing contemporary challenges such as climate change, conflict prevention, and protection of the environment.

Julius Cesar Trajano

RSIS Commentary

28 September 2022

The monkeypox virus is mutating. Are scientists worried?

Although scientists are not alarmed, they are monitoring the situation carefully to understand why the alterations have appeared, and what they might mean for the global monkeypox outbreak.

Max Kozlov

Nature

5 October 2022

Long COVID could be linked to a totally different (and common) virus, new study finds

A number of factors may increase the risk of someone developing long COVID, aside from catching COVID itself. They include having asthma, Type 2 diabetes, or autoimmune conditions, and being female. Now researchers think prior exposure to another coronavirus—one that causes a common cold—may play a role in some patients.

Erin Prater

Fortune

5 October 2022

A wet spring and summer means more mosquitoes but now we've got Japanese encephalitis virus to worry about too

Mosquitoes are a problem every summer. But the recent arrival of the mosquito-borne Japanese encephalitis virus in eastern Australia brings more significant concerns.

Cameron Webb

The Conversation

6 October 2022

Ebola outbreak in Uganda: How worried are researchers?

The rapid rise and spread of the lethal virus across five districts in Uganda have alarmed scientists, and raised fears that the outbreak will not be easy to contain.

Max Kozlov

Nature

7 October 2022

As Omicron mutates wildly the virus shows first signs of convergent evolution

Researchers tracking emerging SARS-CoV-2 variants have started noticing that a variety of different subvariants seem to be accumulating the same mutations, converging in a way to evade our pre-existing immunity. This raises the possibility that the virus has the potential to completely escape our current immune responses.

Rich Haridy

SELECTED PUBLICATIONS

Mental health at work: Policy brief

This policy brief provides actions for governments, employers, employers' and workers' organisations, civil society and health service planners to prevent work-related mental health conditions, protect and promote mental health at work, and support workers with mental health conditions.

World Health Organization and International Labour Organization

2022

Digitalization of routine health information systems: Bangladesh, Indonesia, Pakistan

This report describes a systematic process of transforming paper registers into a digital system optimized to enhance service provision and fulfil reporting requirements.

Tigest Tamrat et. al.

Bulletin of World Health Organization, Vol. 100, No. 10

2022

EVENTS & ANNOUNCEMENTS

How Artificial Intelligence Can Improve Healthcare

This webinar explained how a usefulness analysis can help to convince stakeholders of the impact of machine learning in healthcare. It provided examples of use cases, and answered questions pertaining to application in different scenarios, the future of the technology, and more.

Recorded Webinar

21 September 2022

Mental Health Repercussions of the COVID-19 Crisis

This webinar shared findings on the mental health impact during the COVID-19 crisis in Belgium.

Recorded Webinar

22 September 2022

HUMANITARIAN ASSISTANCE AND DISASTER RELIEF

NEWS & COMMENTARIES

How the humanitarian sector can learn from its past

While the technical aspects of aid have improved significantly from its past, lofty commitments such as the Transformative Agenda or the Grand Bargain tend to go unrealised. This is particularly evident when action involves undoing power imbalances.

Jessica Alexander

The New Humanitarian

6 October 2022

Future heatwaves will lead to large 'loss of life', report warns

Already responsible for more than 70,000 deaths worldwide from 2010 to 2019, this number is only set to increase as heatwaves continue to increase in frequency and intensity around the world.

Al-Jazeera

10 October 2022

Backroom aid: The groups helping behind the scenes

As crises around the world continue to increase, there is a small but growing number of humanitarian organisations which focus on helping frontline humanitarian workers to improve their work. This includes real-time mapping services, negotiation skills and managing data.

Abby Seiff

The New Humanitarian

11 October 2022

What if early warning systems are used to trigger social protection measures in times of crisis?

Social protection is an important aspect of helping people deal with the aftermath of disasters. As such, using early warning systems to trigger the allocation of resources associated with social protection measures for preparedness and preventative actions is likely to be very useful in times of crisis.

Ronald Jackson and Sára Csapó

PreventionWeb

13 October 2022

Put people at heart of climate action as hazards threaten at least 70% of population of nearly a third of world's cities

As urban inhabitants are increasingly threatened by natural hazards as a result of climate change, cities should lead the charge against climate change.

Carbon Disclosure Project

13 October 2022

These AI and satellite mapping techniques are speeding up the process of disaster management

As extreme storms with destructive flooding continue to increase, AI technology can be used to enable disaster mapping of broader areas rather than visually assessing satellite images of one neighbourhood at a time.

Zhe Zhu and Su Ye

World Economic Forum

13 October 2022

SELECTED PUBLICATIONS

Humanitarian accountability report 2022: Accountability is non-negotiable

This report draws on seven years of accountability data analysis, system-wide studies and expert thought. It is an evidence-based overview of the current state of accountability in the aid system, providing a critical opportunity to see the trends, patterns, weaknesses and strengths.

CHS Alliance

2022

Data and displacement: Assessing the practical and ethical implications of data-driven humanitarianism for internally displaced persons in camp-like settings

This report provides an assessment of the operational and ethical challenges of data-driven humanitarian assistance.

Vicki Squire et. al.

The University of Warwick

2022

EVENTS & ANNOUNCEMENTS

Demand and Supply Perspectives on Digital Financial Inclusion and Cash Transfers

This webinar focused on how digital financial inclusion for men and women recipients of digital cash from humanitarian organisations and government social protection actors can be enhanced, and what supply side actors (humanitarian and social protection actors, and the private sector) can do to achieve this goal.

Recorded Webinar

15 September 2022

The Role of National Response Plans in Improving the Coherence and Coordination of Humanitarian Assistance and Social Protection

This webinar discussed the potential of national response plans as common frameworks to ensure available resources are channeled in a harmonised, timely, and needs-based manner to save lives.

Recorded Webinar

22 September 2022

MIGRATION

NEWS & COMMENTARIES

Diego Garcia: Where the Refugee Convention doesn't apply

With the UK's recently enacted Nationality and Borders Act exempting Diego Garcia, a atoll that is part of British Indian Ocean Territory, from the 1951 Refugee Convention, refugees there still remain in limbo.

Jacob Goldberg
The New Humanitarian
 15 September 2022

UN refugee chief warns of 'severe cuts' without urgent funding

The war in Ukraine has severely increased humanitarian needs, adding millions of refugees to an already strained UNHCR budget.

Al-Jazeera
 10 October 2022

Aid sector sex abuse: A common occurrence with reoccurring themes

There are common themes emerging from instances of abuse in the aid sector such as its male-dominated nature, cultural differences as well as limited reporting mechanisms, particularly in refugee camps.

Sam Mednick
The New Humanitarian
 22 September 2022

COVID-19 border policies strengthen Japan's insular mindset

Despite the progress made towards opening up pre-pandemic, Japan's 'no-immigration' seems to have been reinforced with COVID-19. This is seen particularly in its COVID-19 border policies with clear differences between citizens and non-citizens, including permanent residents.

Chris Burgess
East Asia Forum
 12 October 2022

Building knowledge about human trafficking in the Pacific

With its vast nautical area, human trafficking is of significant concern in the Pacific. Despite anti-trafficking training being delivered by international organisations, there is still a large knowledge gap on managing this issue.

Henrietta McNeill
East Asia Forum
 12 October 2022

Empowering migrants during crises: Climate action in South-East Asia

As the impact of climate change and environmental degradation increasingly affects human mobility trends, governments and other stakeholders need to work to protect people on the move.

Anindya Dutta
International Organization for Migration
 13 October 2022

SELECTED PUBLICATIONS

A child's best interests? Rights violations in the absence of presumption of minority

This report highlights some specific problems with the recognition and reception of unrecognised, unaccompanied minors in Lesbos, Greece between 2019 and 2022. It offers specific examples and recommendations to improve current policy in this area.

Fenix – Humanitarian Legal Aid
 2022

Report on migration and asylum 2022

Taking stock of the progress achieved in the New Pact on Migration and Asylum in the past year, this report presents key developments in the area of migration and asylum. It also identifies challenges ahead, accentuating the need for further progress towards a responsible and fair migration management system in the EU.

European Commission
 2022

EVENTS & ANNOUNCEMENTS

Migrant Integration: Learning from What Works in Times of Uncertainty

This webinar brought together experts to examine the state of migrant integration, particularly in contexts marked by uncertainty and limited resources, such as the current effort to integrate displaced Ukrainians.

Recorded Webinar
 11 October 2022

Recognising Refugees: Refugee Studies Centre Conference 2023

This conference is intended to generate reflection on the processes and practices through which refugees and displaced people are formally and informally recognised by societies, institutions, and governments.

Oxford, UK
 20 March – 21 March 2023