NEWS RELEASE

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NTU Singapore study finds generally low public support for nuclear energy development in Southeast Asia

Nuclear energy may be the world's second-largest low carbon energy source for generating electricity after hydroelectric power, but reception to its adoption remains lukewarm in Southeast Asia, a **Nanyang Technological University, Singapore (NTU Singapore)** study has found.

The study, conducted by NTU Singapore's Wee Kim Wee School of Communication and Information, surveyed 1,000 people each in Singapore, Malaysia, Indonesia, Vietnam, and Thailand through door-to-door questionnaires and found that more than half of the respondents in every country were against the idea of nuclear energy development.

Based on its surveys, the study found that about one in five (22 per cent) of those surveyed in Singapore were in favour of nuclear energy development. The level of public support in the other four countries surveyed ranged from 3 per cent to 39 per cent.

The NTU scientists found that the respondents tended to use 'cognitive shortcuts' such as risk and benefit perception (an individual's belief in the threat or benefits of nuclear energy), religious beliefs, and trust in various entities such as university scientists, business leaders, and the government to aid their decision on their level of support for nuclear energy development.

Their study was published in the peer-reviewed academic journal *Energy Research & Social Science* in September.

Today, around 10 per cent of the world's electricity is produced from nuclear energy, but some countries rely on it more heavily. More than 70 per cent of electricity in France, and more than 40 per cent in Sweden, is produced from nuclear energy[1].

[1] *Nuclear Energy, retrieved from Our World in Data*

Japan has nine nuclear reactors in operation, while India debuted its largest domestically built nuclear reactor this year.

The growing inclination towards nuclear energy globally, despite concerns over its safety and steep upfront costs, is largely driven by the motivation to ensure a stable and affordable supply of energy, while aiding in the achievement of emission targets within ratified international agreements, said the researchers.

Singapore, with its limited ability to harness renewable energy at scale due to its geographical location, climatic conditions, and land size, is monitoring the progress of nuclear energy technologies and building capabilities to better understand nuclear science and technology.

Professor Shirley Ho of the Wee Kim Wee School of Communication and Information, who led the study, said: “The generally negative sentiment towards nuclear energy in the region could be a result of a lingering effect of the 2011 Fukushima nuclear reactor meltdown, given the severity of the incident and the close geographical proximity of Japan to Southeast Asia.

“Our findings show that for controversial technologies like nuclear energy, simply enhancing scientific knowledge among the public may not affect their support for nuclear energy. Rather, trust in various entities and risk perceptions are cues that people usually use to interpret scientific information and make judgements. For instance, those who perceive that nuclear energy is not safe are less likely to support nuclear energy development. Knowing that these socio-emotional dimensions are more important than just providing scientific information would be helpful for policymakers seeking to instil public confidence in nuclear technologies in countries where nuclear energy is a viable option.”

With the five countries surveyed in this NTU study geographically close to each other, having a nuclear power plant in any of the five Southeast Asian countries will impact the others, said Prof Ho, who is also NTU’s Research Director for Arts, Humanities, Education, and Social Sciences.

She added: “Having a nuclear power plant in this region, where none exists now, is thus a major policy decision, and public opinion cannot be ignored. As of now, the data from our study suggests that the public across the five countries are collectively unsupportive of having a nuclear power plant in their own country. This is a key point for consideration for policymakers of the five Southeast Asian countries if they are considering including nuclear energy as part of their energy plan going forward.”

How the study was done

On a scale of 1 to 5, respondents were asked to rate the extent of their agreement to statements of support towards nuclear energy; their trust in entities such as the government, and towards university scientists and business leaders in relation to nuclear energy; nuclear knowledge; attention to general news and nuclear-related information; and risks and benefits of nuclear energy.

The findings revealed that the highest level of public support for nuclear energy development was among respondents who were from Indonesia (39%), followed by Singapore (22%), Vietnam (21%), Malaysia (20%), and Thailand (3%).

Indonesia plans to build a nuclear power plant after 2025 to meet national energy demand which is expected to continue to increase and to reduce greenhouse gas emissions, said Indonesia's Director-General of Electricity at the Ministry of Energy and Mineral Resources Rida Mulyana in an interview with CNBC in April[2].

Thailand, home to the first nuclear research reactor in the region, has shown interest in nuclear energy and conducted various economic and technical assessments in preparation for the construction of nuclear power plant, but the energy plan was stalled due to public opposition after the Fukushima nuclear incident.

Prof Ho said: "Indonesia appears to be the one with the most concrete plan for nuclear energy development among the five Southeast Asian countries. Hence, it is expected that Indonesians would have higher public support for nuclear energy compared to the other four countries.

"On the other hand, although Thailand has plans for nuclear energy development, many of the Thai respondents felt that they do not possess sufficient nuclear related knowledge and are not yet ready for nuclear energy, thus showing the lowest level of support for nuclear energy development among the five countries."

Importance of trust in shaping public perception

The NTU scientists also found that as a general trend, the respondents in the five countries surveyed relied on **trust** in university scientists as a cognitive shortcut in decision making when it came to nuclear energy. The respondents in Indonesia, Malaysia, and Singapore also relied on their trust in business leaders to operate and manage nuclear reactors safely.

Dr Agnes Chuah, **Senior Research Fellow in the Wee Kim Wee School of Communication and Information**, who is a co-author on this study said: "Given that scientists are often perceived to have fewer vested interests in nuclear energy

[2] *Siap-Siap, RI Bakal Bangun Pembangkit Nuklir Setelah 2025, CNBC Indonesia, 29 Apr 2021*

development, and the generally strong scientific community in this part of the world, the public may be more willing to entrust this scientific community to provide strong evidence-based research for nuclear energy research."

Going forward, the NTU team will look at other factors that could influence public support towards nuclear energy.

Preliminary data show that safety is a key concern affecting public support towards nuclear energy, and the construction of a nuclear power plant with an advanced nuclear reactor that has enhanced safety, cost competitiveness, and reduced production of radioactive waste compared to existing models could result in greater support. Such advanced nuclear reactor technologies are currently under development in many countries around the world – some of which are expected to be commercialised in the coming decade.

The scientists will also assess public attitudes towards nuclear energy compared to renewable energies such as solar, hydro, biomass, and geothermal energies in Malaysia, Singapore, and Indonesia.

This study is part of NTU's efforts under the university's **2025 strategic plan** to actively contribute to and shape the development of public policy and public sector initiatives.

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Note to Editors:

Paper titled '*Why support nuclear energy? The roles of citizen knowledge, trust, media use, and perceptions across five Southeast Asian countries*'[3] published in *Energy Research & Social Science,* Volume 79, September 2021, 102155

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About Nanyang Technological University, Singapore

[3] *Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Singapore Government.*

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Humanities, Arts, & Social Sciences, and Graduate colleges. It also has a medical school, the Lee Kong Chian School of Medicine, established jointly with Imperial College London.

NTU is also home to world-class autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Ranked amongst the world's top universities by QS, NTU has also been named the world's top young university for the past seven years. The University's main campus is frequently listed among the Top 15 most beautiful university campuses in the world and has 57 Green Mark-certified (equivalent to LEED-certified) buildings, of which 95% are certified Green Mark Platinum. Apart from its main campus, NTU also has a campus in Novena, Singapore's healthcare district.

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

For more information, visit www.ntu.edu.sg.