

## **MEDIA RELEASE**

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### **Singapore to Undertake IAEA Review by International Experts to Assess Its Ability to Make Informed Decision on Nuclear Energy Deployment**

Starting in 2027, Singapore will undertake an assessment by international experts to determine the country's ability to make an informed decision on the potential deployment of advanced nuclear energy technologies in the future. The assessment is known as the **Integrated Nuclear Infrastructure Review (INIR) Phase 1 Mission**.

2 As part of efforts to assess the suitability of advanced nuclear energy technologies for power generation, Singapore has been progressively building capabilities in nuclear science, safety and technology in line with international best practices. The INIR Phase 1 Mission will support the Government in validating our progress and ensuring our capability development is advancing in the right direction, based on an internationally recognised assessment framework known as the **International Atomic Energy Agency (IAEA) Milestones Approach**.

3 The IAEA Milestones Approach comprehensively assesses 19 areas, such as capabilities to manage nuclear safety, radioactive waste, and emergency planning. The Approach reflects international best practices on nuclear energy deployment based on decades of international experience. More information on the IAEA Milestones Approach and INIR Mission can be found in Annex A.

4 The assessment via the INIR Phase 1 Mission will be a key milestone of Singapore's nuclear capability building journey. The Mission will also enable the IAEA to better understand Singapore's current stage of development and provide more tailored support for capability building efforts in the future.

5 Singapore has not made a decision on the adoption or deployment of nuclear energy. We will continue to monitor global developments and work with international partners to build capabilities in nuclear safety and regulation, as part of efforts to study all potential pathways for decarbonisation. Any decision to deploy nuclear energy will be carefully considered against its safety, reliability, affordability, and environmental sustainability in Singapore's context.

Annex A: Factsheet on IAEA Milestones Approach and INIR Mission

Annex B: Understanding the Role of Nuclear Energy in Singapore's Energy Transition

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### **About the Ministry of Trade and Industry**

Our vision is to promote economic growth and create good jobs, to enable Singaporeans to improve their lives. Together with our statutory boards, we will ensure that Singapore's economy continues to be competitive, is able to attract investments, and nurture a deeper base of global Singapore enterprises.

For more information, visit [www.mti.gov.sg](http://www.mti.gov.sg)

### **About the Ministry of Sustainability and the Environment**

The Ministry of Sustainability and the Environment (MSE) is committed to providing Singaporeans with a clean and sustainable environment, and resilient supplies of safe food and water.

MSE works alongside its three statutory boards – the National Environment Agency (NEA), PUB, Singapore's National Water Agency, and the Singapore Food Agency (SFA) – to achieve this mission through innovation, technology, and vibrant partnerships with the private, public, and people (3P) sectors.

For more information, please visit <http://www.mse.gov.sg/>

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### **About the Energy Market Authority**

The Energy Market Authority (EMA) is a statutory board under the Singapore Ministry of Trade and Industry. Through our work, we seek to build a clean energy future that is resilient, sustainable, and competitive. We aim to ensure a reliable and secure energy supply, promote effective competition in the energy market and develop a dynamic energy sector in Singapore. Visit [www.ema.gov.sg](http://www.ema.gov.sg) for more information.

## **About the National Environment Agency**

The National Environment Agency (NEA) is the leading public organisation responsible for ensuring a clean and sustainable environment for Singapore. Its key roles are to improve and sustain a clean environment, promote sustainability and resource efficiency, maintain high public health standards, provide timely and reliable meteorological information, and encourage a vibrant hawker culture. NEA works closely with its partners and the community to develop and spearhead environmental and public health initiatives and programmes. It is committed to motivating every individual to care for the environment as a way of life, in order to build a liveable and sustainable Singapore for present and future generations.

### **For media enquiries, please contact:**

Ms Lu Huijun  
Senior Assistant Director, Communications and Engagement  
Ministry of Trade and Industry  
Tel: (65) 9752 2174  
Email: [lu\\_huijun@mti.gov.sg](mailto:lu_huijun@mti.gov.sg)

Ms Joelynn Tan  
Senior Executive, Strategic Communications & Media Operations  
Ministry of Sustainability and the Environment  
Tel: (65) 9649 3777  
Email: [joelynn\\_tan@mse.gov.sg](mailto:joelynn_tan@mse.gov.sg)

Ms Chua Pei Ling  
Senior Manager, Corporate Communications  
Energy Market Authority  
Tel: (65) 9382 3158  
Email: [chua\\_pei\\_ling@ema.gov.sg](mailto:chua_pei_ling@ema.gov.sg)

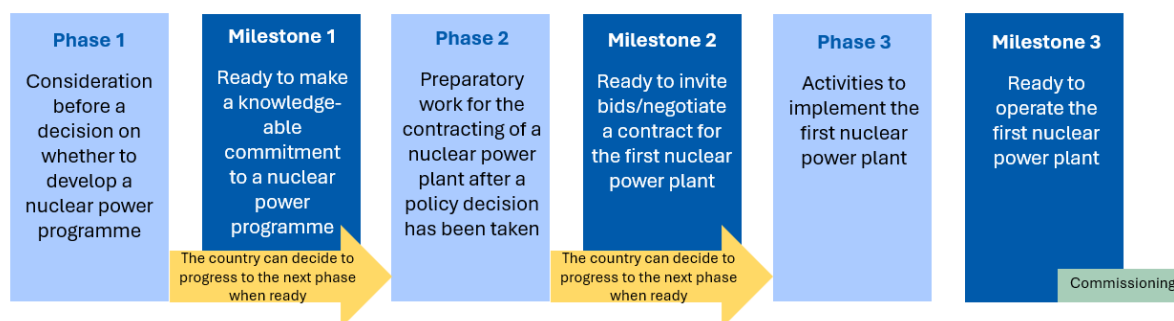
Ms Leonie Tan  
Management Executive, Corporate Communications  
Energy Market Authority  
Tel: (65) 9186 5878  
Email: [leonie\\_tan@ema.gov.sg](mailto:leonie_tan@ema.gov.sg)

Ms Elly Saad  
Manager, Strategic and Media Communications  
National Environment Agency  
Tel: (65) 9066 4418  
Email: [elly\\_saad@nea.gov.sg](mailto:elly_saad@nea.gov.sg)

Ms Guenevere Cordeiro  
Executive Manager, Strategic and Media Communications  
National Environment Agency  
Tel: (65) 9798 3094  
Email: [guenevere\\_magdeline\\_cordeiro@nea.gov.sg](mailto:guenevere_magdeline_cordeiro@nea.gov.sg)

Factsheet on the IAEA Milestones Approach and INIR Mission

- The IAEA Milestones Approach provides a structured, internationally recognised framework to guide countries in understanding the commitments and obligations associated with developing a nuclear power programme.
- It defines key milestones a country must attain before constructing its first nuclear power plant, to ensure that necessary legal, regulatory, safety, security and technical foundations are in place. For each milestone, the IAEA Milestones Approach also outlines the phases that countries would need to go through, as shown in the diagram below:



- The Milestones Approach structures the development of a national infrastructure for nuclear power around 19 areas.

S/N	Area
1.	National Position
2.	Nuclear safety
3.	Management
4.	Funding and financing
5.	Legal framework
6.	Safeguards
7.	Regulatory framework
8.	Radiation protection
9.	Electrical grid
10.	Human resource development
11.	Stakeholder involvement
12.	Site and supporting facilities
13.	Environmental protection
14.	Emergency planning
15.	Nuclear security
16.	Nuclear fuel cycle
17.	Radioactive waste management
18.	Industrial involvement

## The INIR Mission

- The INIR is an independent and voluntary assessment by IAEA for countries considering to embark on or expand their nuclear power programme. It ensures that the national infrastructure required for the safe, secure and sustainable use of nuclear power is developed and implemented in a responsible and orderly manner.
- There are three steps in the INIR Mission:
  - Step 1 (In Progress): **Preparation of the Self-Evaluation Report (SER)**, which is a self-evaluation of the requesting country's status of development with respect to the 19 areas.
  - Step 2 (tentatively 2027): **Conduct of the main INIR mission**, where the requesting country hosts a week-long plenary interview conducted by IAEA experts. The IAEA will publish key Mission findings right after the Mission.
  - Step 3 (tentatively 2027/2028): **Finalisation of Mission Report**, where the IAEA will detail its observations, recommendations and suggestions, which the country will use to develop a National Action Plan to chart out additional work required to reach Milestone 1. We intend to share the results of the INIR Mission to keep the public informed on our activities and strengthen Singaporeans' understanding of nuclear energy.
- Countries that have completed the INIR Phase 1 Mission can use the report findings to assess their readiness to make an informed decision on whether to adopt nuclear energy. Countries that have completed the INIR Phase 1 Mission include Estonia, Malaysia, Indonesia, the Philippines, Rwanda, Thailand and Vietnam. Not all countries that have completed the Phase 1 Mission have moved on to subsequent phases.
- More information about the INIR missions that the IAEA has conducted for various countries can be found on their website: <https://www.iaea.org/services/review-missions/integrated-nuclear-infrastructure-review-inir>

### Understanding the Role of Nuclear Energy in Singapore's Energy Transition

- As a small and resource-constrained nation, Singapore takes a diversified portfolio approach to meet our growing energy needs, while pursuing net-zero carbon emissions by 2050.
- Singapore's strategy seeks to balance the need for energy security, sustainability and cost-competitiveness ("Energy Trilemma"), recognising that trade-offs are inevitable and no single solution is perfect.

### **Navigating the Energy Trilemma**

- Today, about 95% of Singapore's electricity is produced using imported **natural gas**. This makes Singapore vulnerable to volatilities in the global environment, including fuel supply chain disruptions and energy price fluctuations. Natural gas is also a fossil fuel that produces carbon dioxide when burned.
- Singapore is one of the most **solar** dense cities in the world. But even at its maximum deployment, solar will only meet less than 10% of Singapore's electricity demand by 2050 due to land constraints. Sunlight is also weather dependent, hence requiring other energy sources or energy storage solutions to underpin energy supply reliability.
- Singapore is working on **importing electricity from other countries**, such as Australia, Cambodia, Indonesia, Malaysia, and Vietnam. By 2035, one-third of Singapore's electricity could come from imports. Renewable electricity supply from other countries is also weather dependent, and subject to supply chain disruptions.
- Singapore cannot depend only on domestic solar and electricity imports to power Singapore. That is why Singapore is pursuing a portfolio of low-carbon energy sources, including studying nuclear energy, geothermal and hydrogen. The technologies to harness many alternative sources, however, are still nascent.

### **Potential Value of Advanced Nuclear Energy Technologies**

- Nuclear energy is a low-carbon energy source that has the potential to provide safe, reliable and cost-competitive electricity supply for Singapore.
- Nuclear power plants can operate for extended periods without refuelling, providing a reliable source of baseload electricity while being less exposed to

fluctuations in global fuel prices. This supports more stable electricity generation costs over the long term.

- Advancements in technology have also improved the safety of nuclear systems. Singapore has been studying advanced nuclear technologies such as small modular reactors, which incorporate enhanced safety features without the need for human intervention or external power.
- In addition, nuclear energy's high energy density makes it a potentially suitable option for land-scarce Singapore. Five one-inch-tall uranium pellets – each smaller than an average thumb – can generate the same amount of energy as one Olympic-sized swimming pool of natural gas.
- Nuclear energy has the potential to address Singapore's energy security concerns while supporting our net-zero goals. Hence, we are rigorously studying its potential and closely monitoring the advancements in the nuclear energy space, so that we are ready to make an informed decision on the safe deployment of nuclear energy when the technology is ready.
- However, any decision to deploy new energy technologies, including nuclear, will be carefully considered against their safety, reliability, affordability, and environmental sustainability in Singapore's context.
- Nuclear energy is a specialised field, and Singapore will continue to develop a wide range of capabilities to understand the technologies, potential benefits, risks and trade-offs.