

FOR IMMEDIATE REPORTING

INVESTMENT IN TECHNOLOGY AND INTERNATIONAL COLLABORATIONS ARE KEY TO SINGAPORE'S ENERGY TRANSITION

1. The seventh International Advisory Panel (IAP) on Energy was held virtually, on 22nd and 24th November 2021. The IAP discussions were chaired by Second Minister for Trade and Industry Dr Tan See Leng. The IAP, which comprises international energy experts, was set up by the Ministry of Trade and Industry to provide insights and perspectives on emerging trends in the global energy arena, and to advise Singapore on the strategic directions for the energy sector.

2. Given the increasing impetus to address climate change and decarbonise the power sector, the IAP deliberated on the challenges and opportunities facing Singapore amidst the energy transition, and strategies to facilitate a smooth energy transition.

Emerging Global Trends and Challenges to Singapore's Energy Transition

3. The IAP highlighted three key trends that have emerged from the global energy transition. First, the growing importance of renewable energy as a source of power. Second, electrification across various sectors which is increasing global electricity demand. This, combined with the climate imperative, provides added impetus to reduce the carbon footprint for the power sector. Third, investments in fossil-fuel based technologies and resources may decline as countries and companies pivot to cleaner energy. Natural gas markets may become more volatile as a result.

4. The IAP recognised that the energy transition would be a challenging and complex exercise for many countries, including Singapore.

- a. First, as cleaner energy sources replace traditional energy sources, there may be increased energy security and reliability risks which need to be mitigated. As countries ramp up their decarbonisation efforts, competition for renewable energy sources will increase. Ensuring secure and reliable access to renewable energy, both domestically and regionally, would become a salient issue for alternative-energy disadvantaged countries like Singapore.
- b. Second, technological uncertainties. While significant advancements have been made in low-carbon technology such as Hydrogen and Carbon Capture, Storage and Utilisation (CCUS) solutions, the technology is still nascent and not ready for commercial deployment at scale. Early investments in these technologies will be needed to enable decarbonisation but may lead to increased costs for consumers.

- c. Third, cybersecurity. As we digitalise our power systems to improve efficiency and allow the integration of new energy sources, the power sector also becomes more vulnerable to cybersecurity risks.

5. However, the IAP also highlighted that Singapore is well-positioned to address these challenges and navigate the energy transition. Singapore should continue to pursue policy initiatives that support innovation and foster more international collaborations, while maintaining flexibility for the future.

Safeguarding Energy Security and Resilience Amidst the Energy Transition

6. The IAP expressed support for MTI and the Energy Market Authority's (EMA) Singapore Energy Transition strategy to decarbonise the energy sector, and highlighted the importance of safeguards for energy security and reliability in three areas:

- a. Natural gas. Natural gas would continue to play an important role in our energy transition, complementing low-carbon sources and providing added security and resilience. Governments around the world, including Singapore, would need to work with various stakeholders to safeguard the security and reliability of natural gas supply. This includes better articulating the role of natural gas and other traditional fuels in the global energy transition.
- b. Regional power grids. Singapore would need to consider electricity imports from a range of source countries to minimise concentration risk. Singapore should also consider putting in place measures, including local back-up generation capacity, and commercial and regulatory safeguards, to ensure steady and reliable supply of electricity.
- c. Energy storage systems. Energy storage systems (ESS) are an important feature of power systems as they help to mitigate intermittency from renewable energy. The IAP suggested that Singapore continue to trial and develop regulatory frameworks to support ESS deployment.

Other Technologies which may be Suitable for the Longer Term

7. For the longer term, the IAP suggested that Singapore keep our options open and continue to work with industry partners and explore alternative low-carbon technologies. These include hydrogen, flexible power plants, CCUS (which would support the use of traditional fuels while mitigating carbon emissions), nuclear technologies and flexible smart grids that can monitor, protect and optimise power transmission.

8. With significant advancements in hydrogen-related technology, Singapore could continue to partner with the industry and invest in research and development efforts to facilitate deployment. The IAP also recognised Singapore's potential to leverage its strengths as a global LNG trading hub and grow into a hydrogen hub in the future.

Supportive Regulatory Framework to Address Challenges and Facilitate Transition

9. The meeting noted the importance of combining predictability and confidence in the regulatory regime with flexibility and nimbleness. This ensures that Singapore remains responsive to the dynamic energy environment, while safeguarding energy security and reliability. Singapore could also consider developing market incentives to facilitate demand management and encourage investments in sustainable energy technologies.

10. The IAP also highlighted the implications that the energy transition would have on workers in the energy sector. We will need to actively reskill our workforce to ensure that we have the skills and capabilities to support the energy transition.

11. MTI and EMA will study the recommendations from IAP members and incorporate them as part of our energy transition strategy.

Annexes:

Annex A: About the International Advisory Panel on Energy

Annex B: List of International Advisory Panel on Energy Members

**MINISTRY OF TRADE AND INDUSTRY
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Annex A

About the International Advisory Panel on Energy

1. The International Advisory Panel (IAP) was set up by the Ministry of Trade and Industry (MTI) to provide insights and perspectives on emerging trends in the global energy arena, and to advise on the strategic directions for the energy sector in Singapore. This will enable us to be prepared to meet the challenges and leverage on the opportunities that are emerging in the global energy landscape.
2. The panel comprises a group of top energy executives and thought leaders from around the world. Dr Tan See Leng, Minister for Manpower and Second Minister for Trade and Industry, chairs the IAP.
3. The IAP meetings are held biennially and the IAP's recommendations have informed our national energy policy. The previous meeting of the IAP in 2019 discussed energy security and digitalisation.

Annex B

List of International Advisory Panel on Energy Members

Name	Designation
Chairman	
Dr Tan See Leng	Minister for Manpower and Second Minister for Trade and Industry
Members	
Dr Dan Arvizu	Chancellor of the New Mexico State University System
Prof Alberto Sagiovanni Vincentelli	The Edgar L. and Harold H. Buttner Chair, Department of Electrical Engineering and Computer Sciences, University of California at Berkeley
Ms Maria van der Hoeven	Senior Fellow, Clingendael International Energy Programme
Dr Robert Judd	Secretary General, General of the European Gas Research Group (GERG)
Dr Robert Weisenmiller	Former Chair of California Energy Commission (CEC)
Mr David Gray	Former Chairman of Office of Gas and Electricity Markets (OFGEM)
Mr Maikel van Verseveld	Managing Director, Accenture
Mr Jon Wellingshoff	Chief Executive Officer, Gridpolicy Inc
Mr Adnan Z Amin	Senior Fellow, Belfer Center for Science and International Affairs Harvard Kennedy School
Mr Peter J Coleman	Chief Executive Officer and Managing Director, Woodside Petroleum
Mr Benoit Potier	Chairman and Chief Executive Officer, Air Liquide, and Co-Chairman, Hydrogen Council
Mr Sumant Sinha	Chairman and Managing Director, Renew Power

Absent with Apologies

Name	Designation
Lord Ronald Oxburgh	Member of the House of Lords and Ex-Chairman of The Shell Transport and Trading Company p.l.c
Dr Arunava Majumdar	Jay Precourt Provostial Chair Professor, Department of Mechanical Engineering, and Co-Director, Precourt Institute for Energy