

NAME :
COUNTRY : Australia
REGISTRATION NUMBER :

GROUP REF. :
PREF. SUBJECT : PS3
QUESTION N° : 4

National Electricity Market of Singapore (NEMS): Transition Experience

1. Singapore has limited renewable energy potential + high dependency on gas-fired technology
2. Solar energy remains the only feasible renewable solution for deployment in land-scarce Singapore.
3. Today the the energy transition impact on Singapore's power system reliability is minimal.
 - The System Average Interruption Duration Index (SAIDI) and the System Average Interruption Index (SAIFI), which serve as system reliability indicators, stand at **0.17 minutes** and **0.006 interruptions** in 2020, and the Singapore grid continues to be one of the most reliable in the world.
4. The energy transition impact on cost is still relatively muted as Singapore has yet to reach a high enough renewable penetration ("Duck Curve") to affect the price formation in the wholesale market.
 - The price formation in NEMS is still dominated by thermal plants running on both long-term and spot natural gas. The high year-to-date price (till end-June 2022) of **\$325.13/MWh** was caused mainly by the tightness of the Liquefied Natural Gas (LNG) market due to the Ukraine-Russia conflicts and the extreme weather globally
5. Expert Committee deemed is **realistic for Singapore's power sector to aspire to achieve net-zero emissions by 2050**, even though it will be challenging due to uncertainties in geopolitical trends and technological advancements in the energy space.
6. Recommended strategies include
 - Pursuing the adoption of electricity imports
 - Using more ESS to manage solar intermittency
 - Shape end user consumption patterns to optimize the power system

Recommended Strategies

1. Adoption of electricity Import
 - Why? → Matured Technology, Allow Access to cleaner and cost-effective sources and reduce reliance on natural gas
 - Current Progress → 1) Trial electricity with ASEAN countries. LTMS – PIP go live on Jun 22. 2) EMA request for proposal for imports up to 4GW. 3) Consultation on imports back-up
 - Longer term action – Set up of Regional Power Exchange
2. Using more ESS to manage solar intermittency
 - Why? → ESS to support more deployment of solar in Singapore
 - Current progress → Integrate 2.4MW of BESS and preparing for 200MW/MWh battery by end 2022
 - Longer term action – Creation of new revenue streams for ESS
3. Shaping end-user consumer patters to optimize
 - Why? → High adoption of technology + managing demand to reduce need to upgrade grid or generation capacity
 - Current progress → Consultation on revamping of demand response scheme
 - Longer term action → 1) Enhancing market design to provide price signals and incentivize behavioural changes among end-users. 2) Unlocking areas where end-users can tap demand flexibility.