



THE OXFORD  
INSTITUTE  
FOR ENERGY  
STUDIES

# Electricity supply industry reform and design of a competitive electricity market in Malaysia

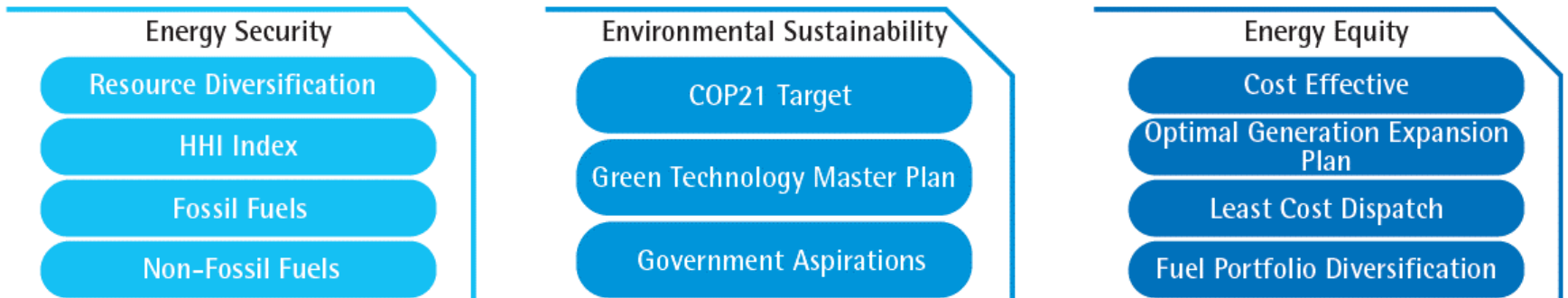
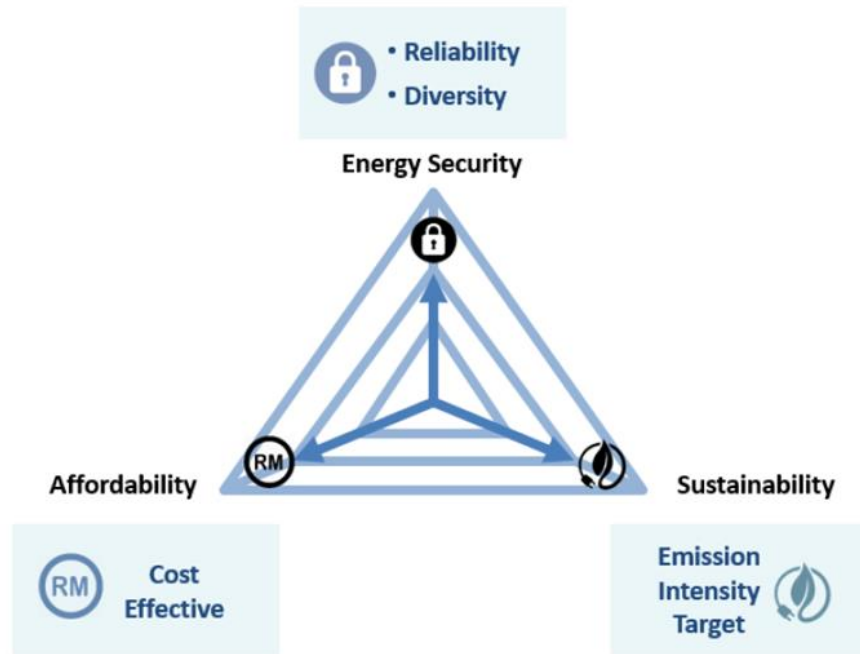
OIES-Uniten joint webinar

8 April 2021





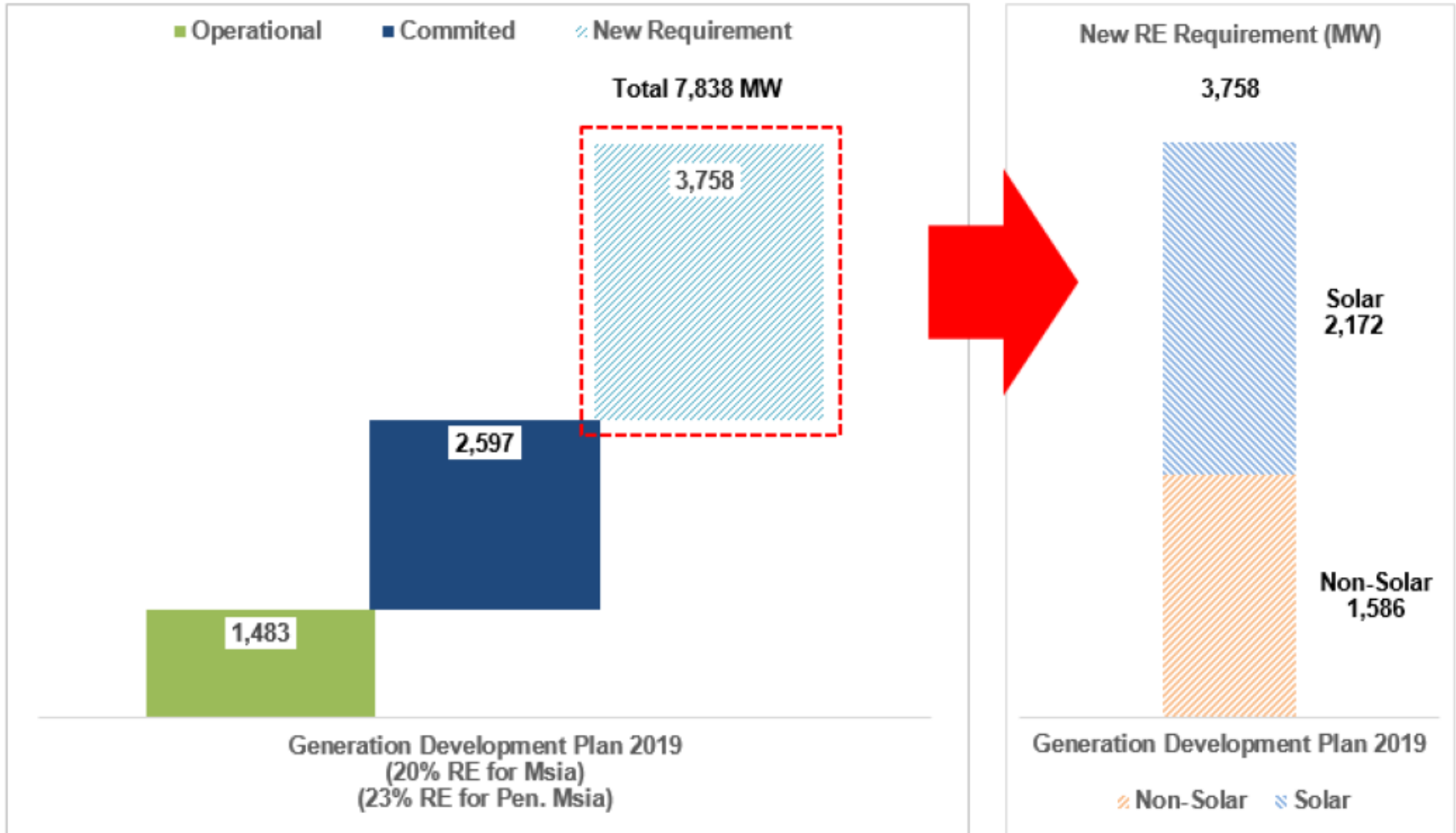
# Energy trilemma and the Malaysian power sector



Source: SURUHANJAYA TENAGA (ENERGY COMMISSION)



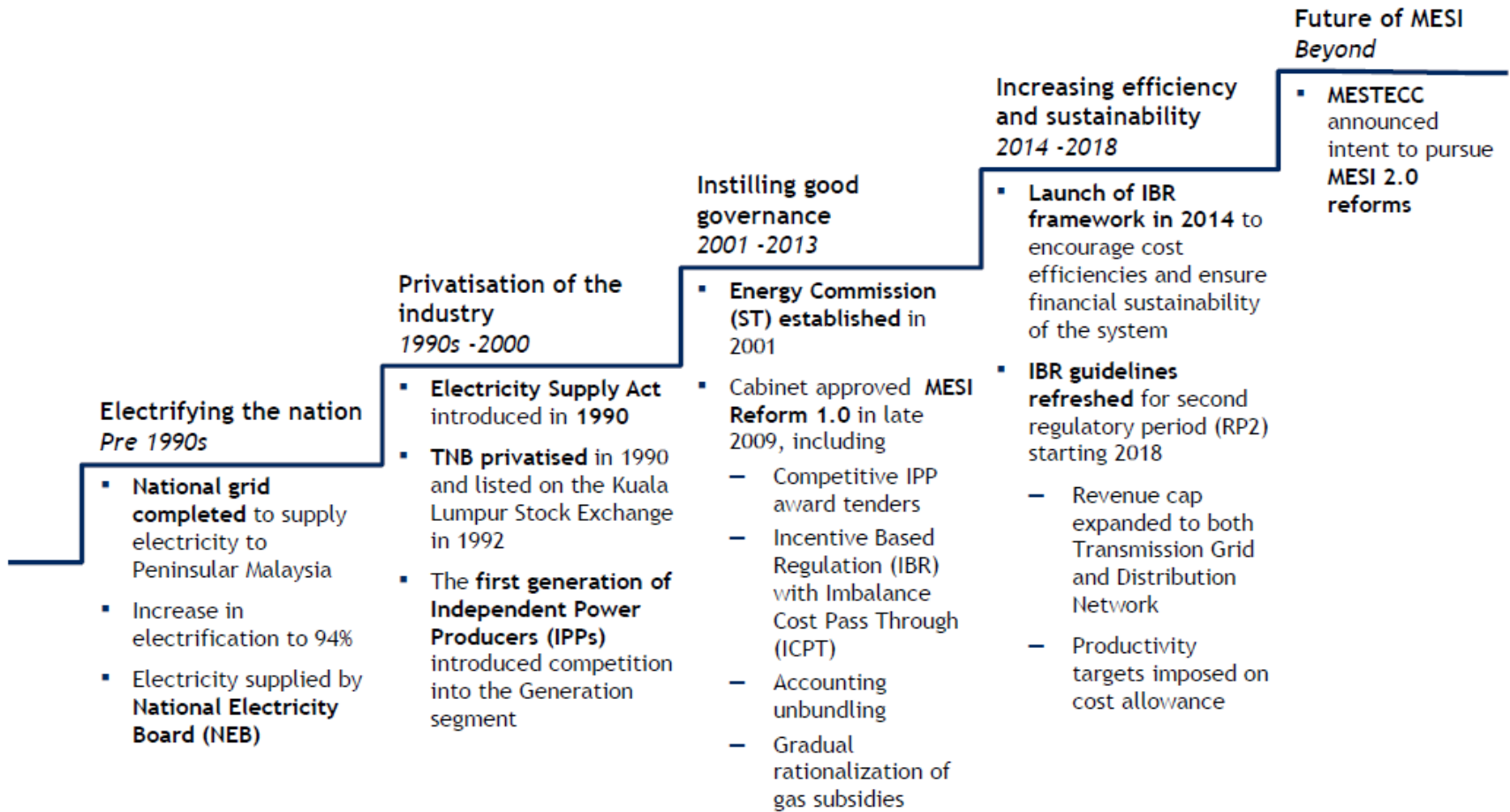
# New RE requirement to meet the 20% RE capacity mix by 2025



Source: SURUHANJAYA TENAGA (ENERGY COMMISSION)



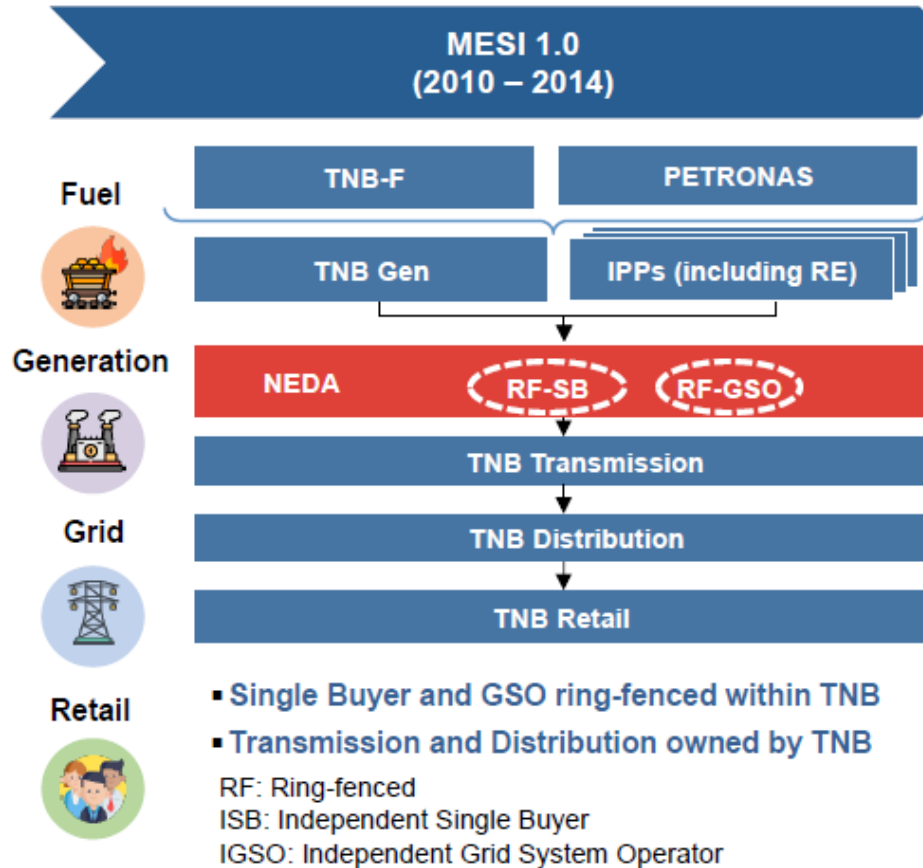
# The evolution of the Malaysian Electricity Supply Industry (MESI)



Source: TNB (Presentation to Analyst)



# Malaysian Electricity Supply Industry (MESI) 1.0



- **Lack of incentive** to procure lower cost fuel for generation due to pass-through nature; hence no price risk to IPP

- Higher base-tariff due to surplus capacity i.e. 35% vs ~25%<sup>1</sup> optimal reserve margin
- PPAs framework outdated; risk-free for players with long term tenure (21–25 years); all risks pass through to consumers
- Lack of renewable energy

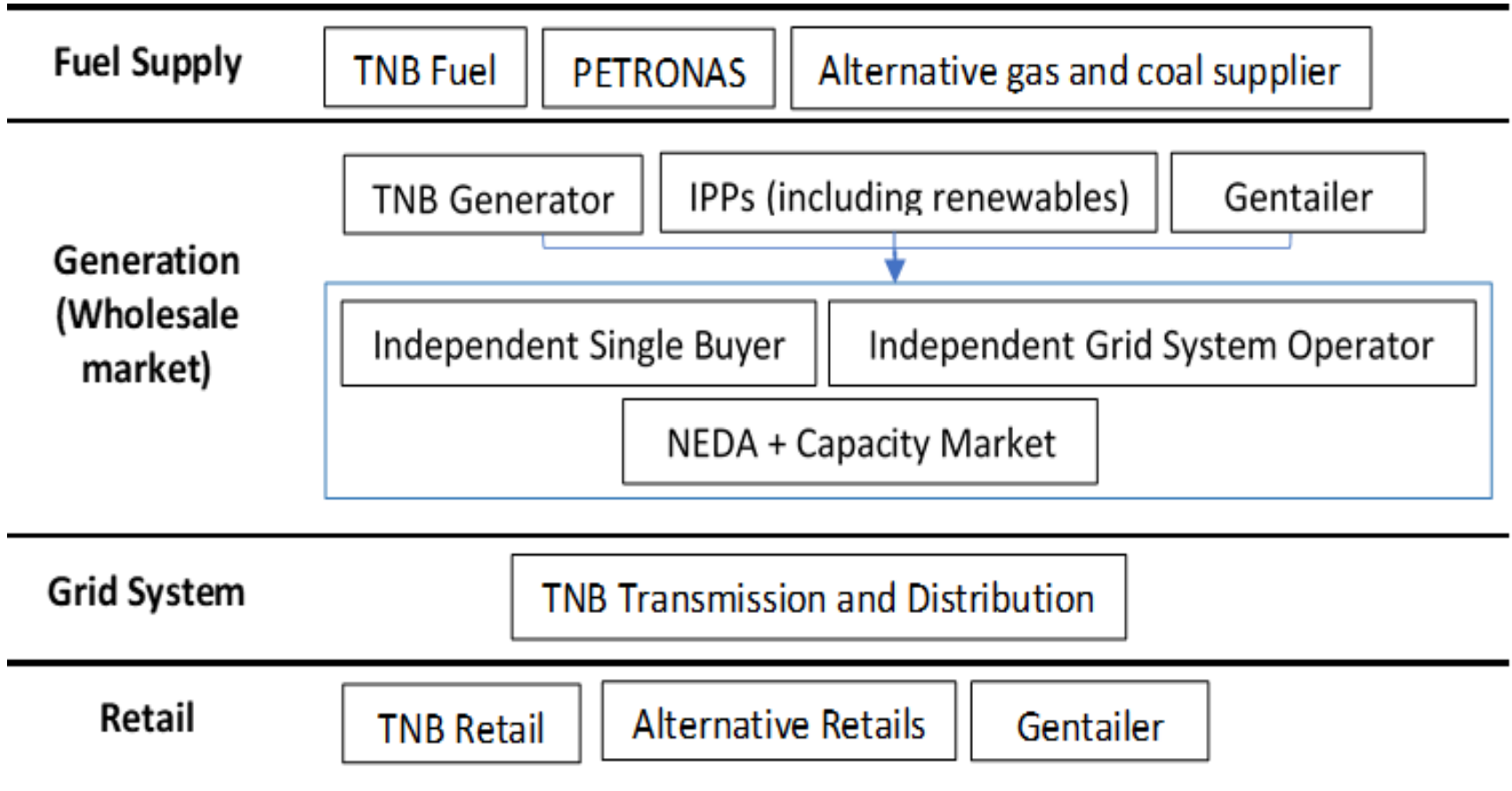
- Incentives-based-regulation (IBR) results in no incentive for efficiency in CAPEX spending
- Ownership of Single Buyer and System Operator by TNB makes it bias to (or perceived as) TNB compared to other players

- Consumers have **no options** in selecting provider & service packages
- Commercial and Industry tariffs are not as competitive as Singapore and Vietnam
- Pricing mechanism is non-cost reflective resulting in probable inefficient use

Source: Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC)



# Malaysian Electricity Supply Industry (MESI) 2.0





## Research questions

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- The research questions focused on issues related to the reform model, decentralization of the electricity market, and the design of suitable support schemes for renewables in Peninsular Malaysia.
- 1. What is the most suitable reform model for the Malaysian electricity sector which will promote competition, security of supply, and sustainability while at the same time being compatible with the country's own context and government objectives?
- 2. How does decentralization (distributed generation, storage, demand response, and energy efficiency) affect the Malaysian electricity sector?
- 3. How do renewable support schemes need to be designed and implemented in order to avoid or minimize distortion in the market?



## Market design

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- Generation market design
  - Centralised pool versus decentralised bilateral contract market plus power exchange
  - Resource adequacy
  - Market power
  - Ancillary services market
- Retail electricity market
  - Barriers to entry and competition
  - Consumer engagement and competition
  - Consumer protection

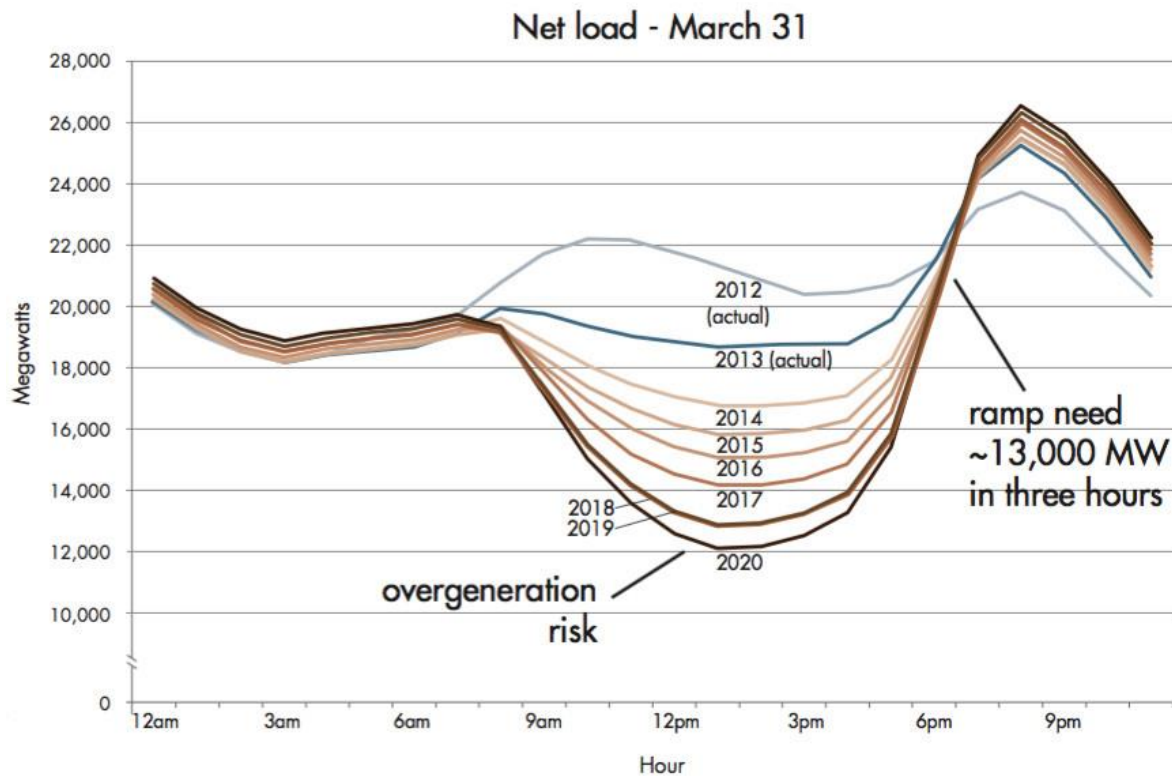




# Impacts of decentralization on the electricity market

- Over generation due to growth of solar PVs

**Figure 2: The duck curve shows steep ramping needs and overgeneration risk**





## Impacts of growth of decentralization on the electricity market-continued

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- The need for system flexibility
- TSO-DSO coordination
- Participation of DERs in the electricity market
  - Modernisation of distribution network
- Retail tariff design
  - Time of use tariff



# The design of renewable support schemes for the Malaysian electricity sector

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- Indirect support policies for renewables
- Direct support policies for renewables
  - Production based schemes
  - Investment-based schemes
- Revenue sufficiency of renewable support schemes
- Burden sharing of renewable support schemes
- The trade-off between market compatibility and investors' incentive
- Balancing responsibility and priority dispatch



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**Thank you for your attention**

