

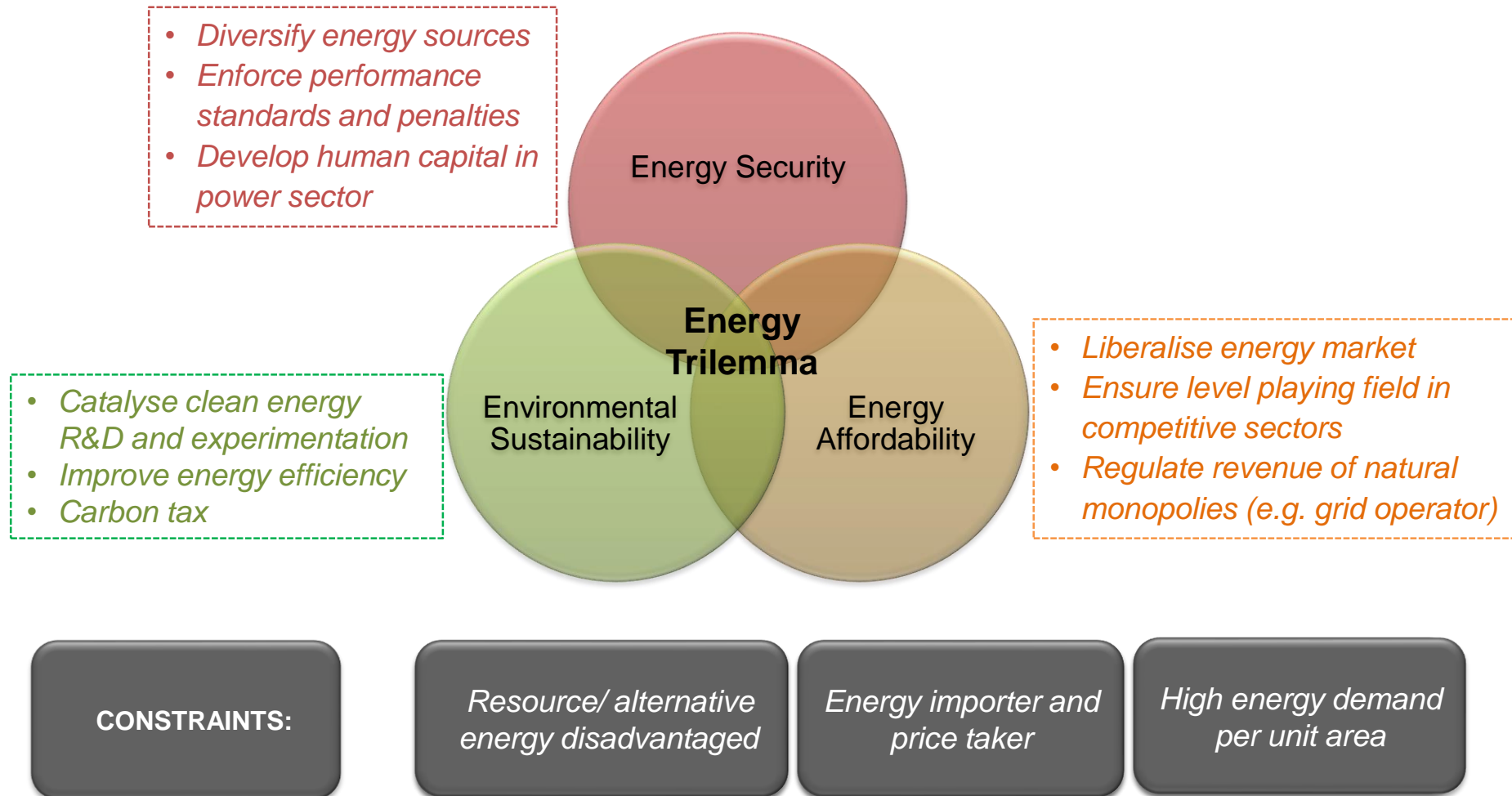
Workshop on Electricity and Environmental Markets - Singapore's Electricity Market

Ngiam Shih Chun

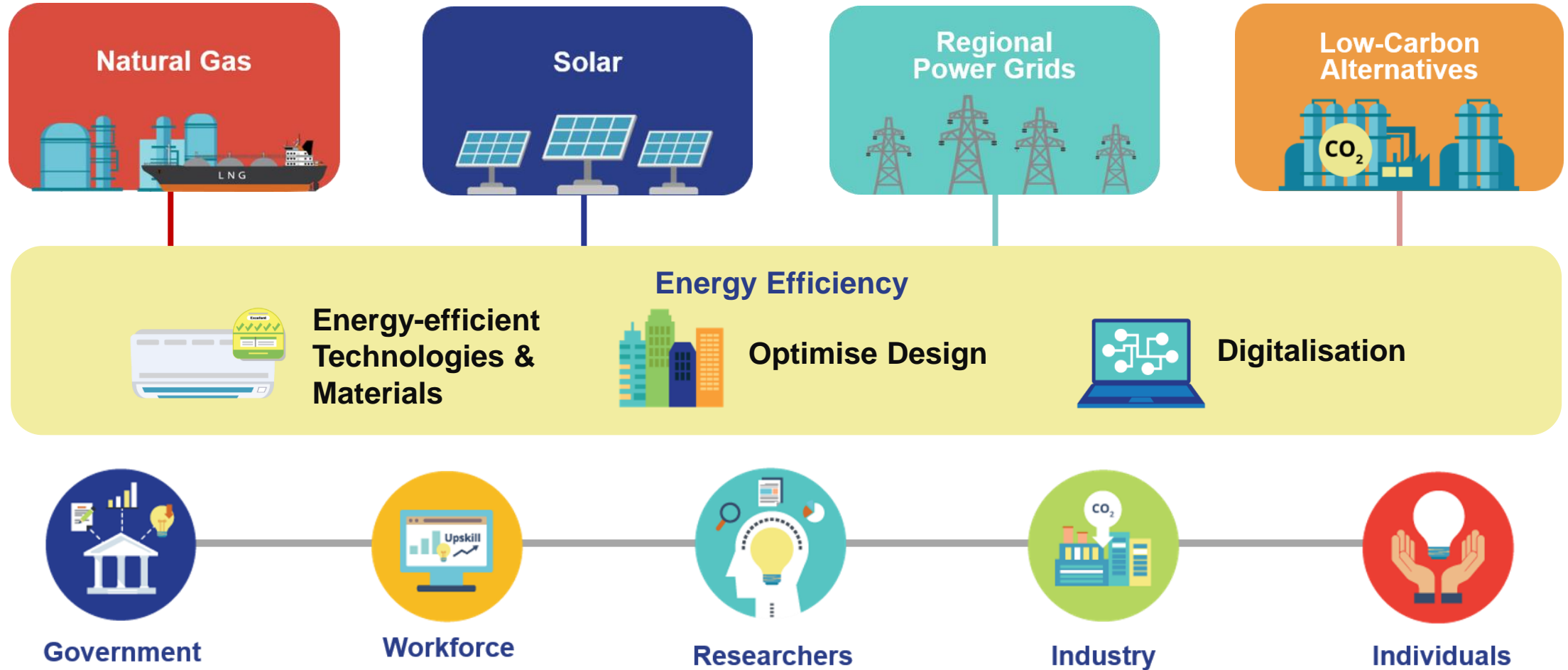
Chief Executive, Energy Market Authority

24 Nov 2020

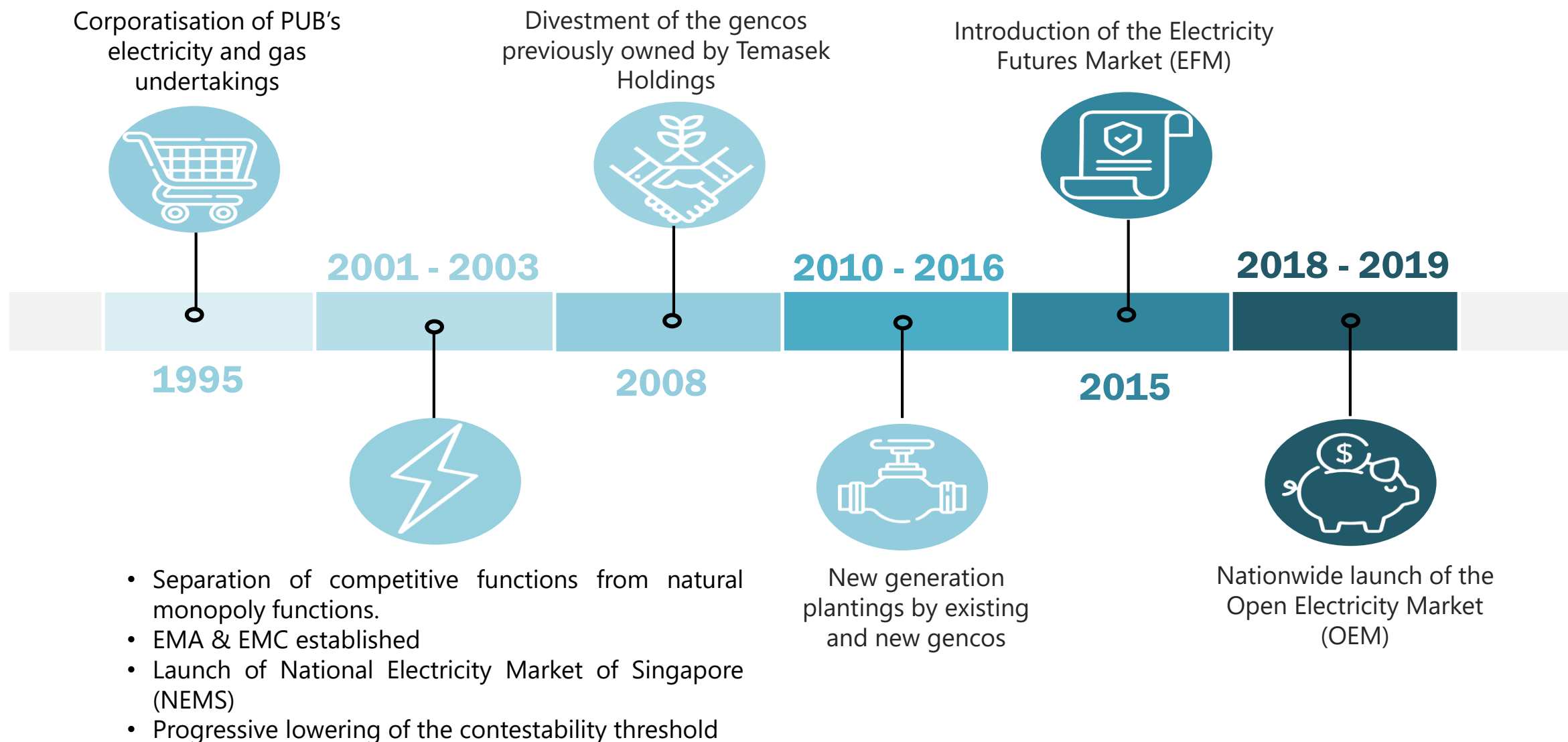
As an energy developer, regulator and system operator, EMA seeks to balance trade-offs across the Energy Trilemma



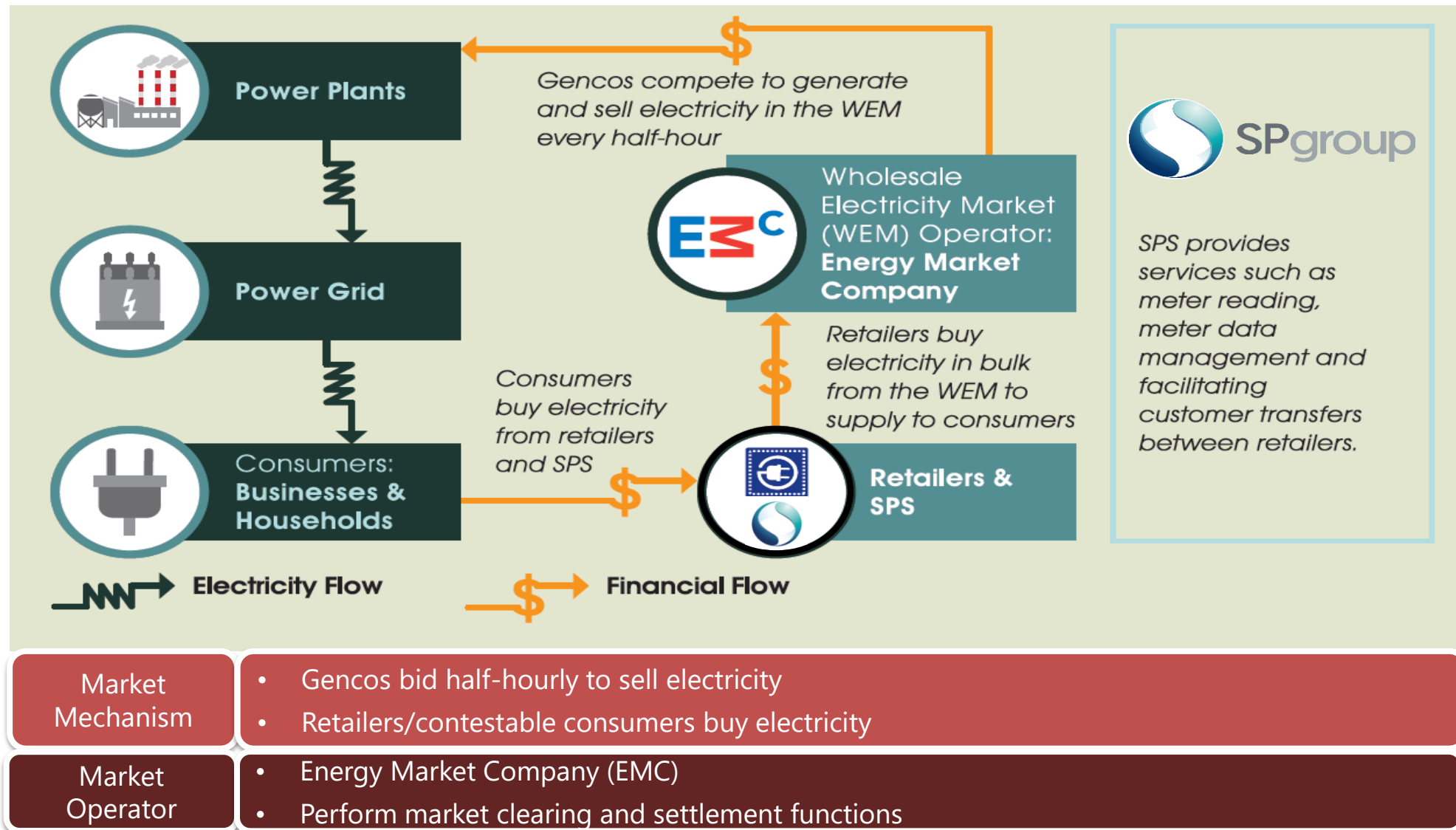
In 2019, we launched Singapore's Energy Story to outline Four Switches we will adopt, to green our energy sources and optimise our energy usage



Singapore's electricity market has evolved over the years

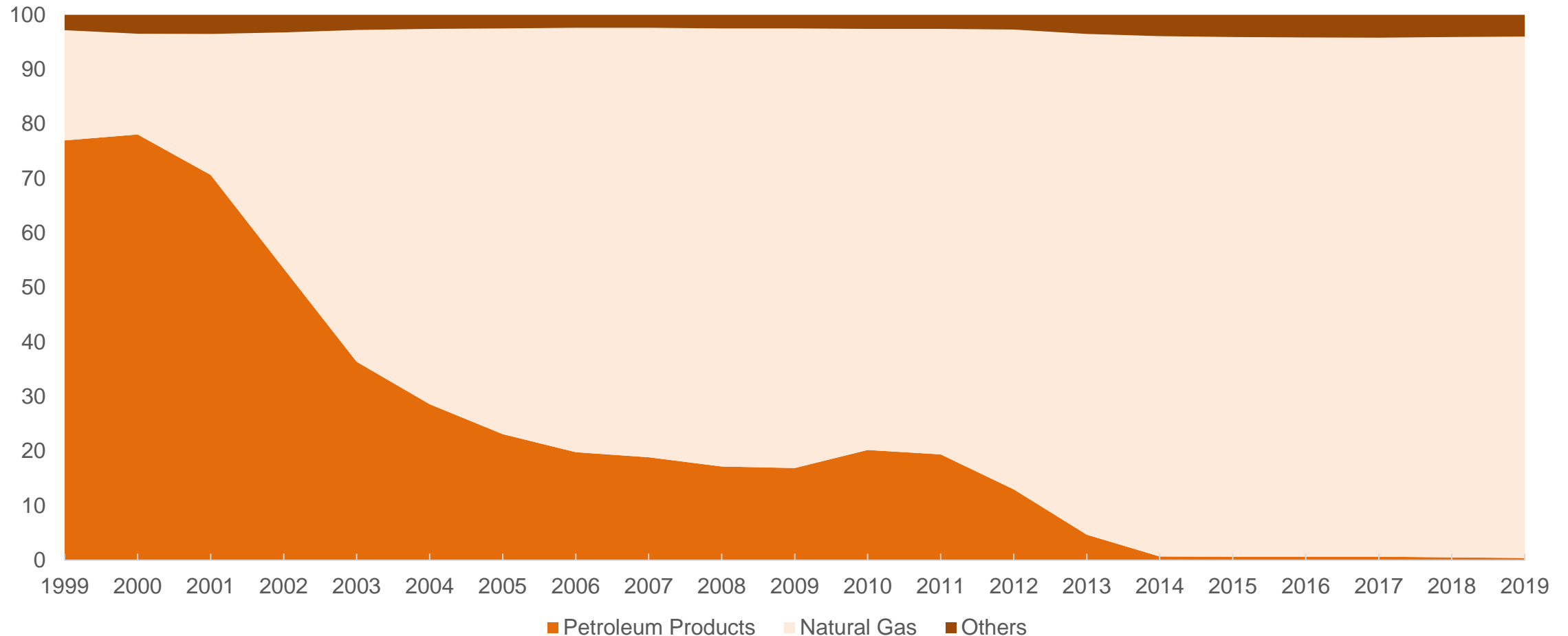


Overview of National Electricity Market of Singapore (NEMS)

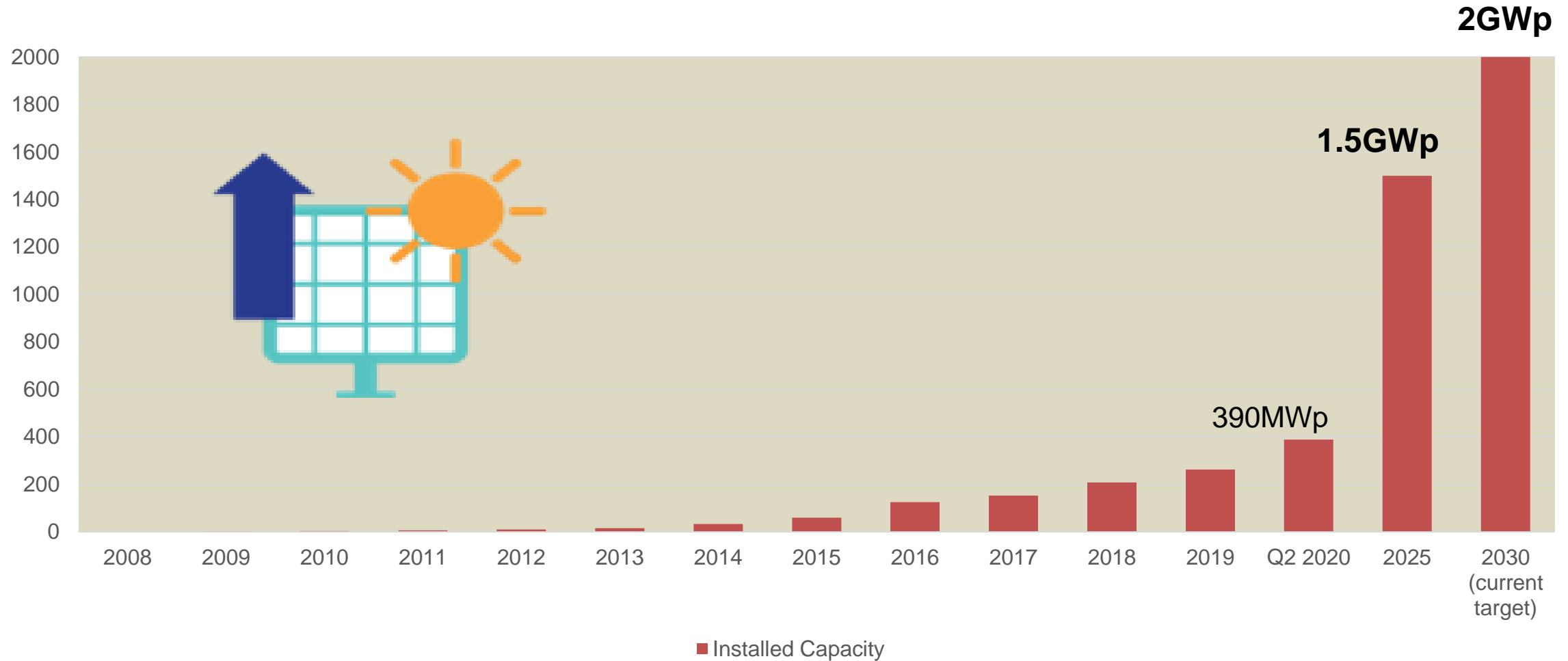


Efficient Markets - Singapore transited to natural gas for power generation, which accounts to about 95% of our fuel mix today

Singapore Electricity Fuel Mix in % (1999 - 2019)



Transparent Markets - Solar has grown significantly and we aim to achieve at least 2GWp by 2030



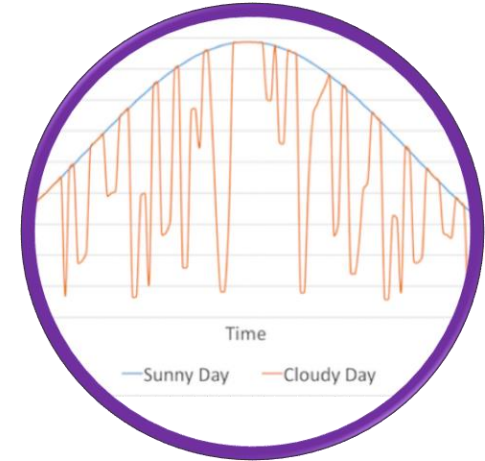
For efficient markets, externalities need to be priced appropriately



Carbon Tax

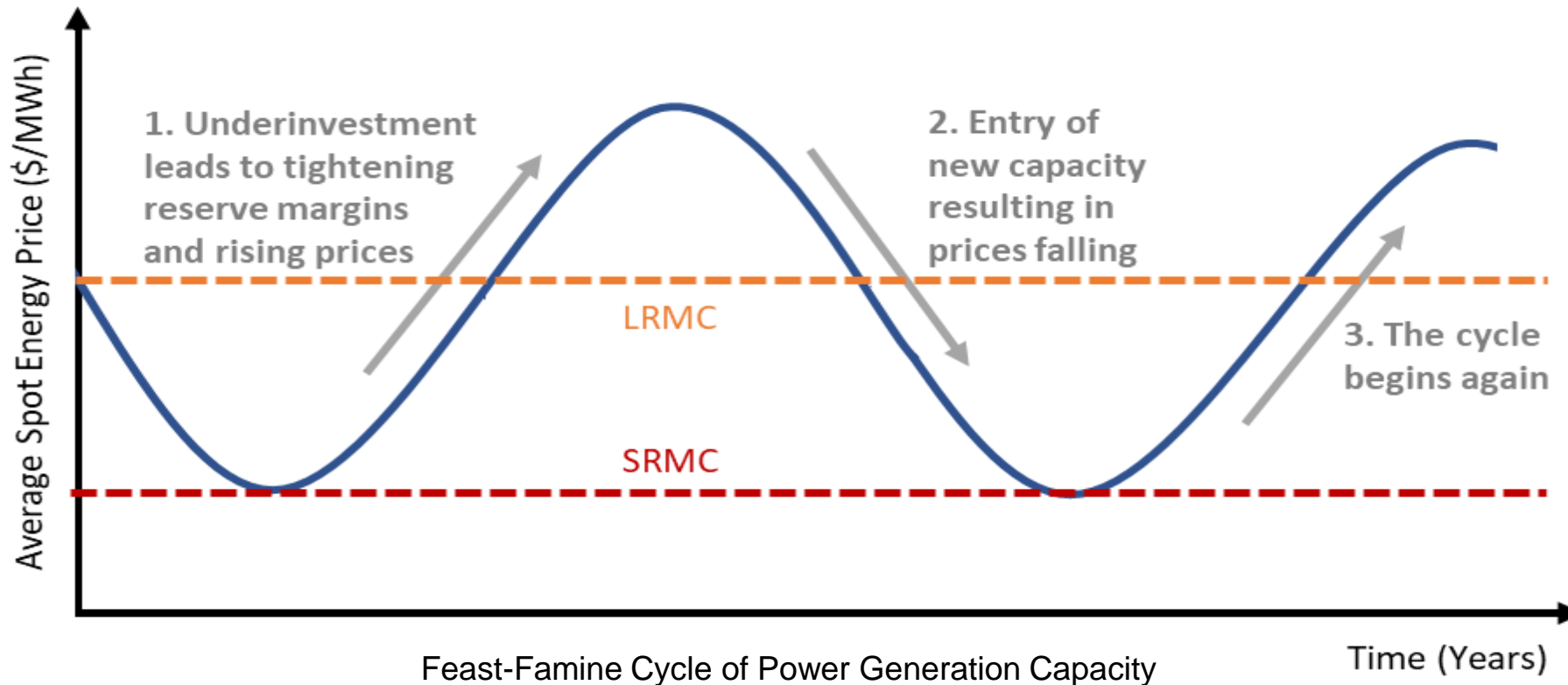


**Renewable Energy
Certificates**



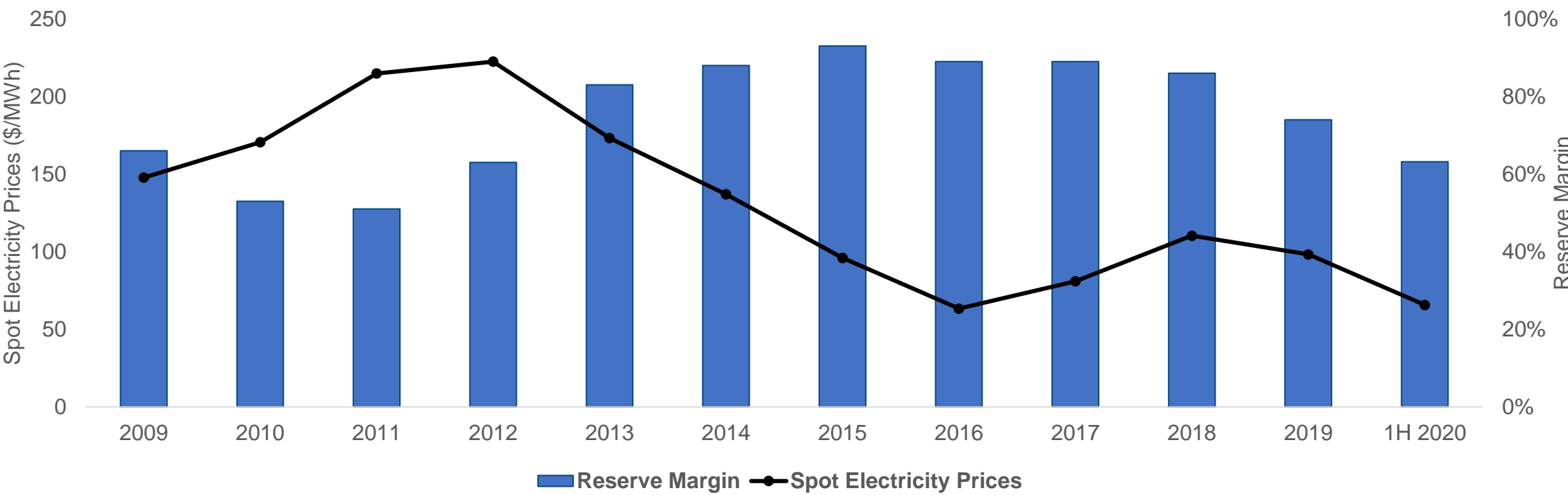
**Managing Intermittency of
Renewables**

Commodity markets face feast-famine cycles - SWEM is an Energy-Only Market (EOM) with cyclical periods of over-supply and low prices, followed by periods of tight supply and high prices



Spot Electricity Prices declined as generation capacity increased over time

Reserve Margin vs Spot Electricity Prices



To ensure resource adequacy in the longer term, EMA will introduce a Forward Capacity Market (FCM) in 2021

What is the FCM?

- FCM is a competitive market-based auction to procure required generation capacity up to four years ahead of the Delivery Year.
- Forward-looking framework of the FCM facilitates the entry and exit of resources in a coordinated and orderly manner
- The Feast-Famine cycle of power generation would be moderated as investment decisions would be guided by EMA's demand forecast and FCM auction results.

FCM can moderate the Feast-Famine Cycle of Power Generation and benefit all Stakeholders including the Resource Suppliers, Investors/Lenders and Consumers

Resource Suppliers

- Stable stream of income via the capacity payments from the FCM in addition to spot market revenues.
- Solar PV suppliers also benefits from capacity payments.

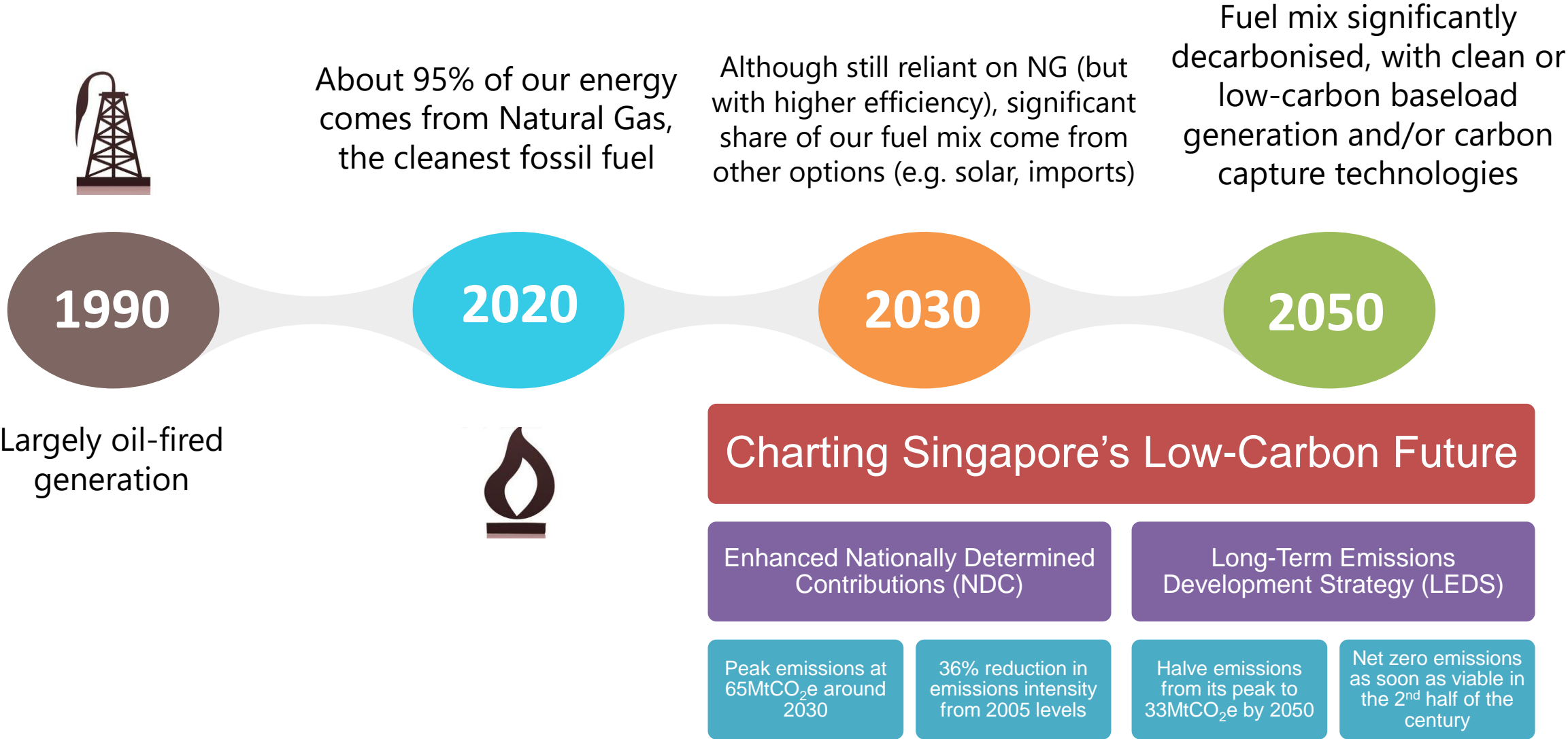
Investors/Lenders

- Lowered investment risk

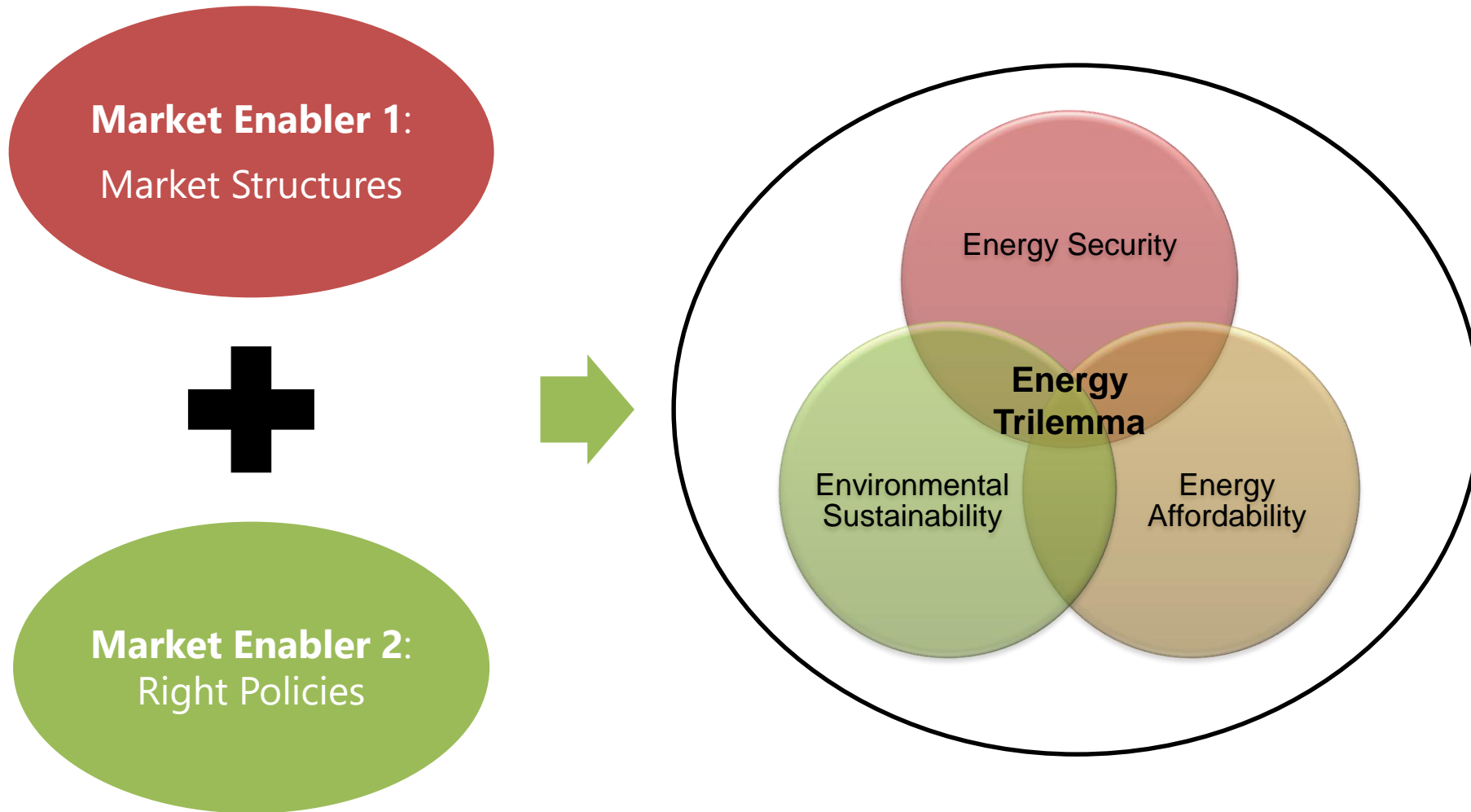
Consumers

- Enhance certainty of a reliable and secure supply of electricity to meet rising demand
- Facilitate entry of various technology types (such as CCGTs, Solar and Demand Response) which will help drive competitive prices
- Strengthened checks and balances in place to ensure system reliability

With the right policies and measures, the electricity market can enable us to achieve our Energy 2050 goals while still ensuring competitive outcomes.



In conclusion, well-designed market structures and right energy policies will enable Singapore to manage the challenges of our energy trilemma.



THANK YOU