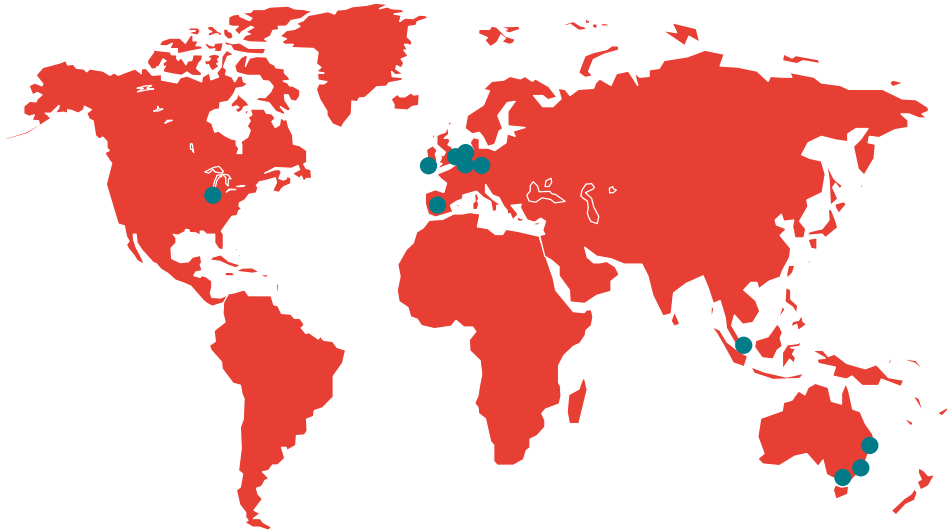


Electricity Market Liberalisation in Malaysia: Opportunities and Challenges

13 February 2018

Frontier Economics



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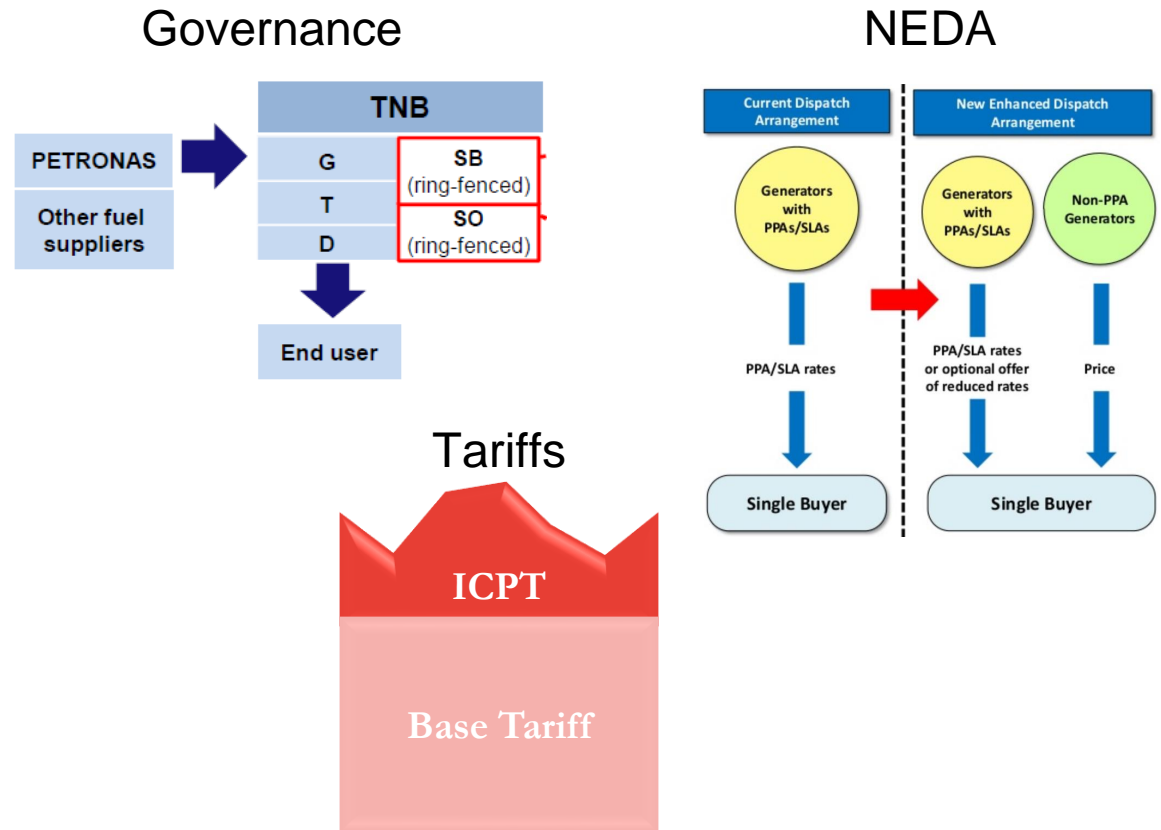
- Director, head of Singapore office
- Gas and electricity market expert
- Advisor to ST, EMA, MESI/NEMS market participants

Over 200 consultants across 11 offices

- Why pursue further reform?
- What are the challenges from here?
- How could Malaysia proceed?

Why pursue further reform?

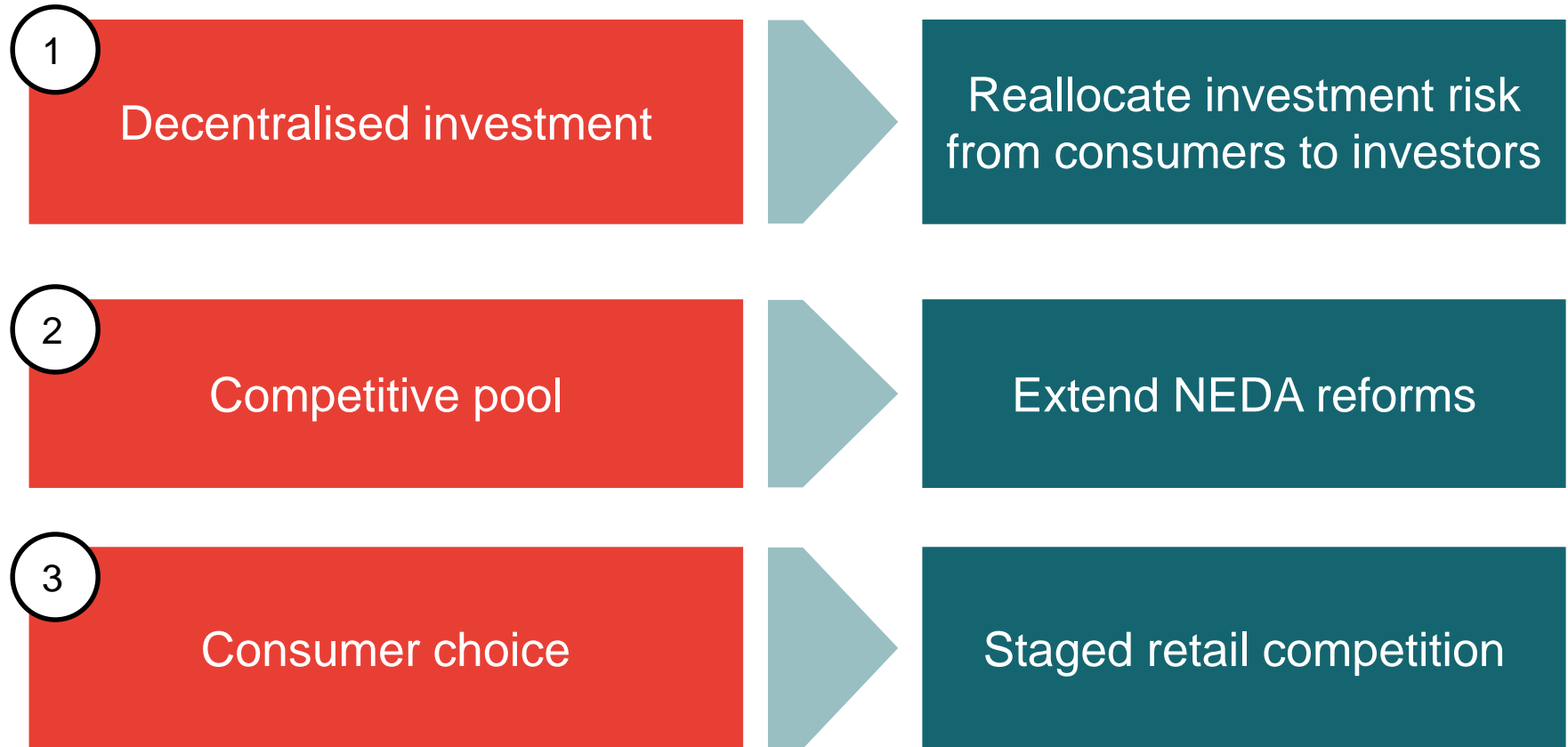
Malaysia has progressed an impressive reform program



... but key elements of a liberalised market lie ahead

Why pursue further reform?

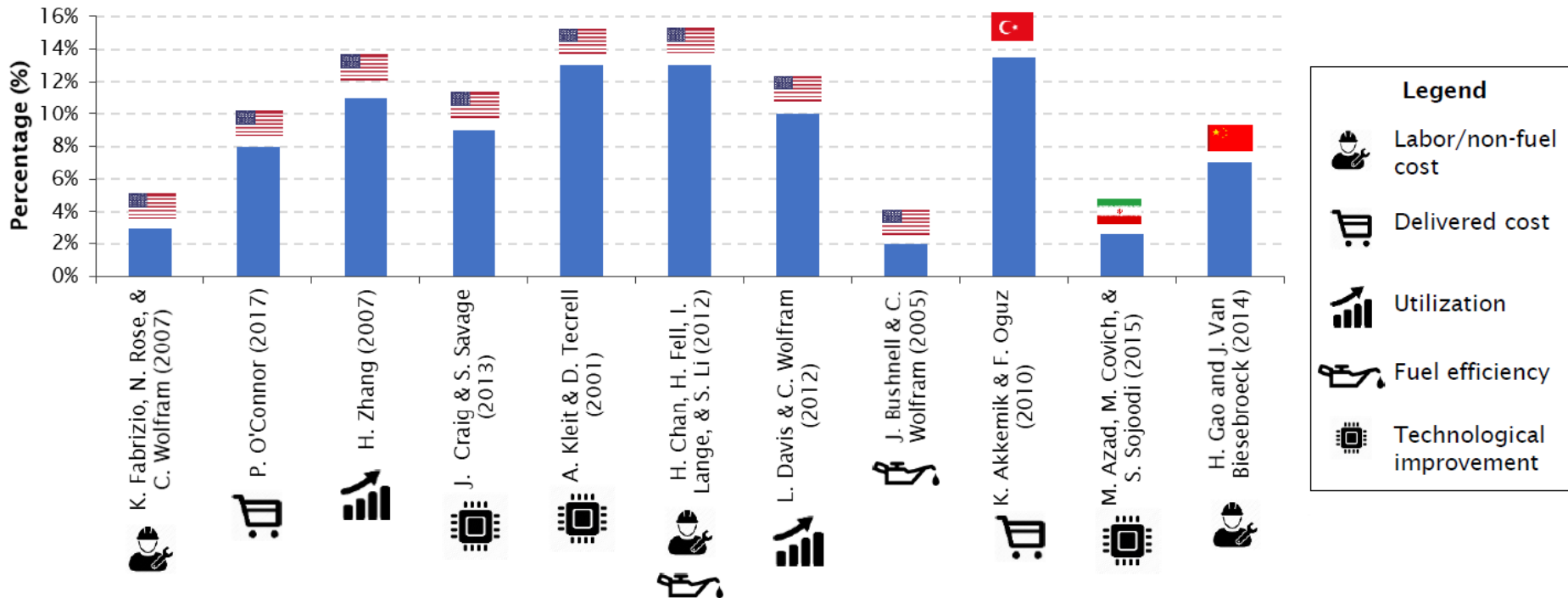
What's left to do?



Benefits flow from competitive wholesale and retail markets

Why pursue further reform? Is it worth doing?

Range of observed efficiency gains resulting from unbundling

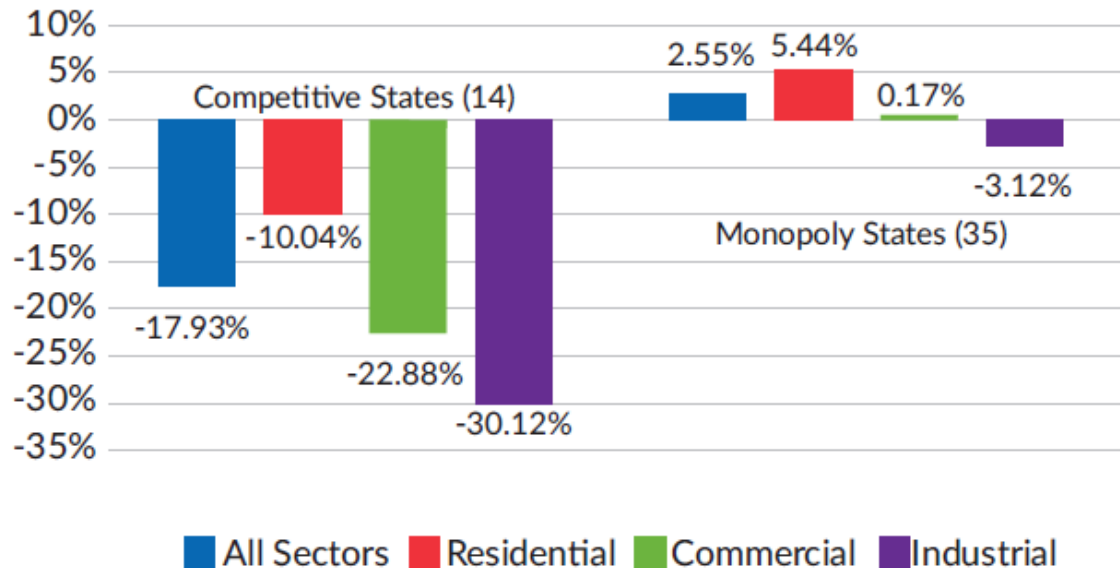


Source: London Economics International, review of global studies

Evidence suggest yes ...

Why pursue further reform? Is it worth doing?

Figure 12: Inflation-Adjusted Weighted Average Percentage Price Change by Customer Class, Choice vs. Monopoly States, 2008-2016



Source: P O'Connor, Restructuring Recharged The Superior Performance of Competitive Electricity Markets 2008-2016, April 2017

... with benefits flowing to consumers

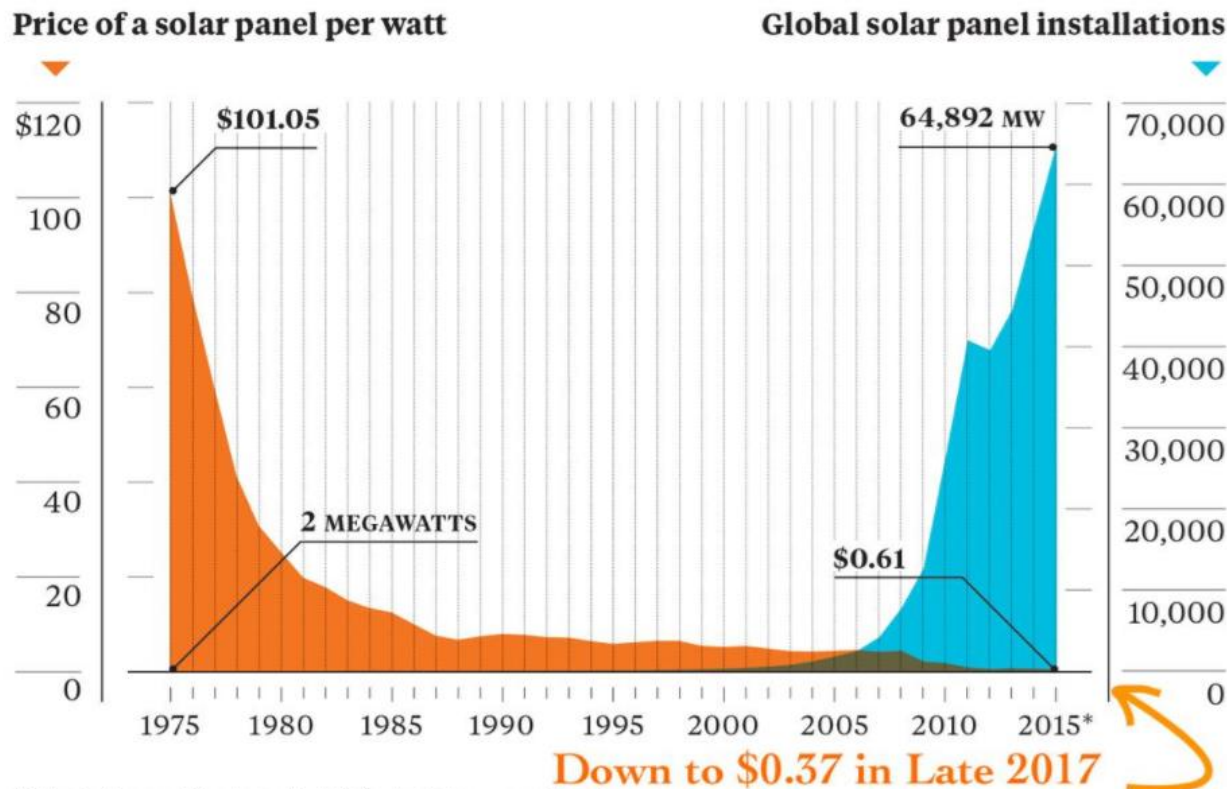
What are the challenges from here?

Rise of utility RE and storage

Distributed energy resources
and prosumers

What are the challenges from here?

Rise of utility RE and storage



There has been a radical reduction in RE costs, especially PV

Saudi/Chile/Mexico all saw PPAs signed at <USD\$20/MWh in 2017

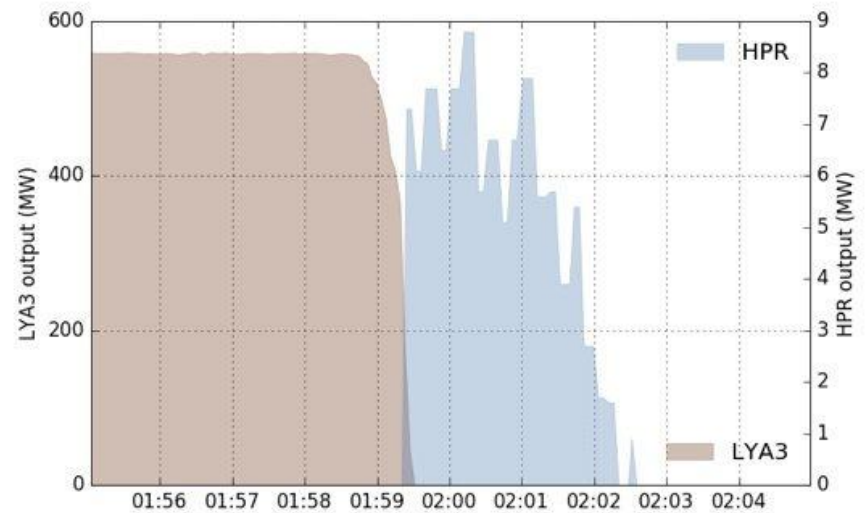
What are the challenges from here?

Rise of utility RE and storage

Elon Musk has finished building the world's biggest battery in less than 100 days

As promised to help South Australia with energy problems

by Thuy Ong | @ThuyOng | Nov 23, 2017, 5:03am EST



Storage is a game changer, proving up RE to dispatchable levels and providing grid security

What are the challenges from here?

Distributed energy resources
and prosumers

Demand response

Residential PV and storage

Smart homes

Network stranding and stress

With changes accelerating ...

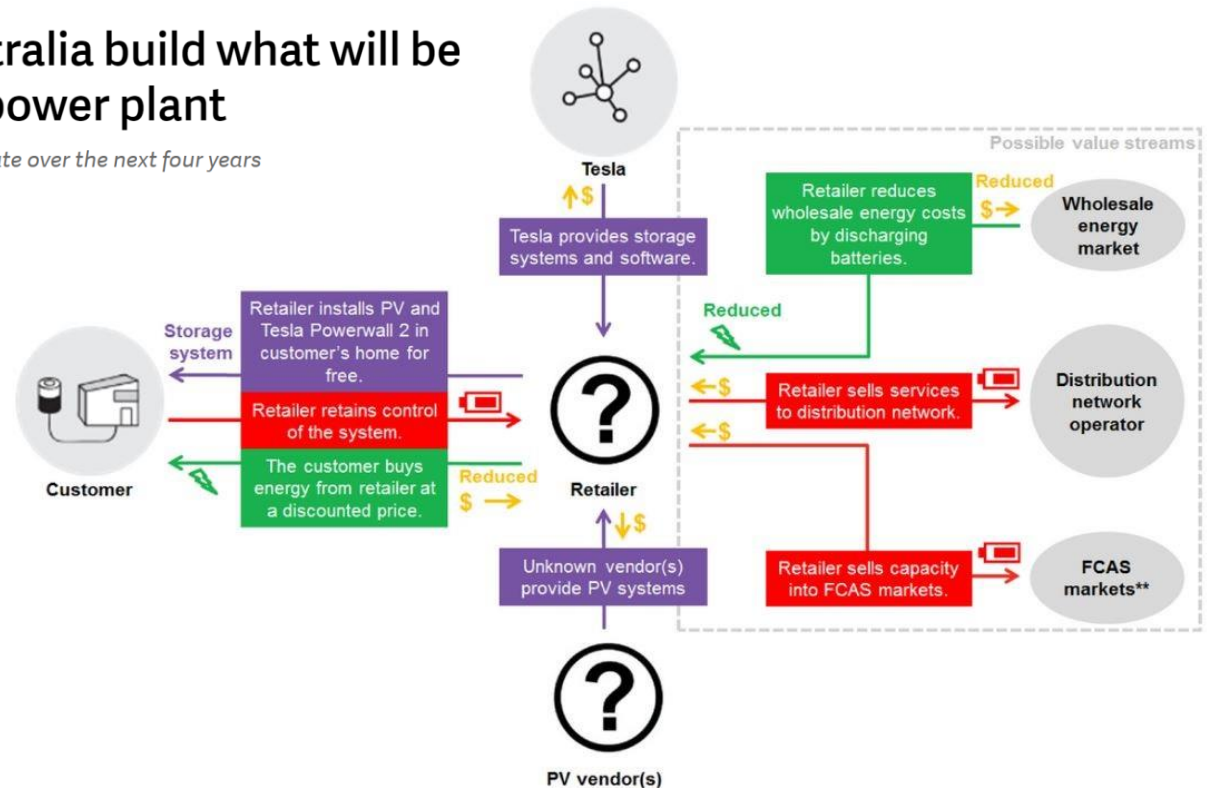
What are the challenges from here?

Distributed energy resources and prosumers

Tesla is helping South Australia build what will be the world's largest virtual power plant

Installation is planned for 50,000 homes across the state over the next four years

New approaches like virtual power plants are likely to take this trend further

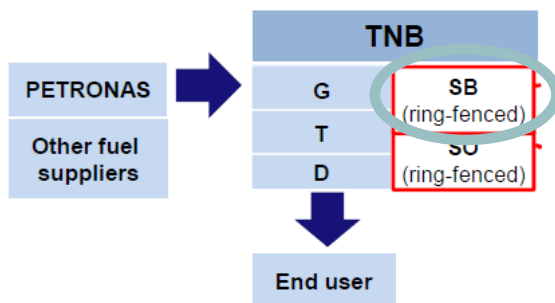


How could Malaysia proceed from here?

1

Decentralised investment

Reallocate investment risk
from consumers to investors



Capacity market

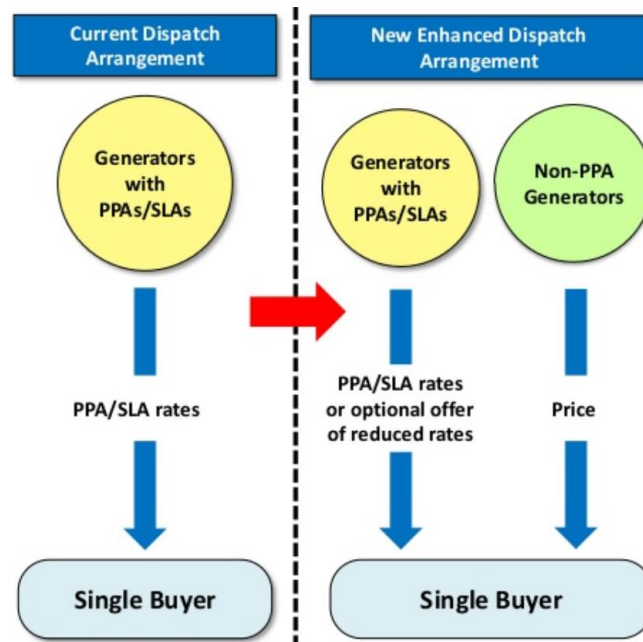
Energy only gross pool

How could Malaysia proceed from here?

2

Competitive pool

Extend NEDA reforms



Energy only gross pool

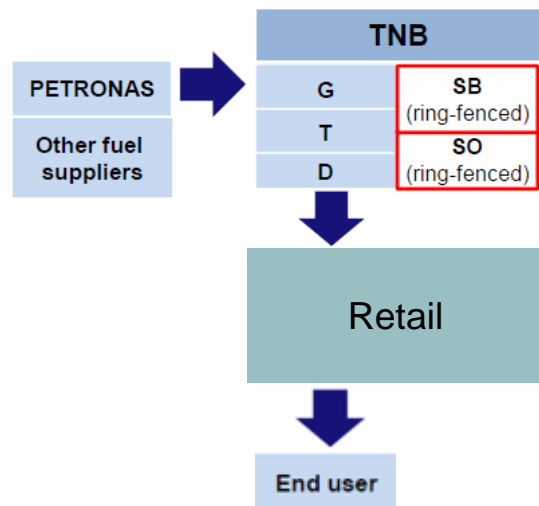
As per SG, PH, VN

How could Malaysia proceed from here?

3

Consumer choice

Staged retail competition



Staged introduction of retail competition

SG completing, PH starting

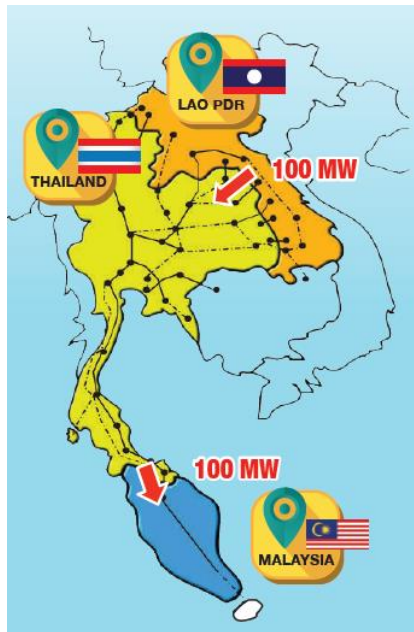
Wholesale competition enables retail, retail competition reinforces wholesale, both drive efficiency and innovation

How could Malaysia proceed from here?

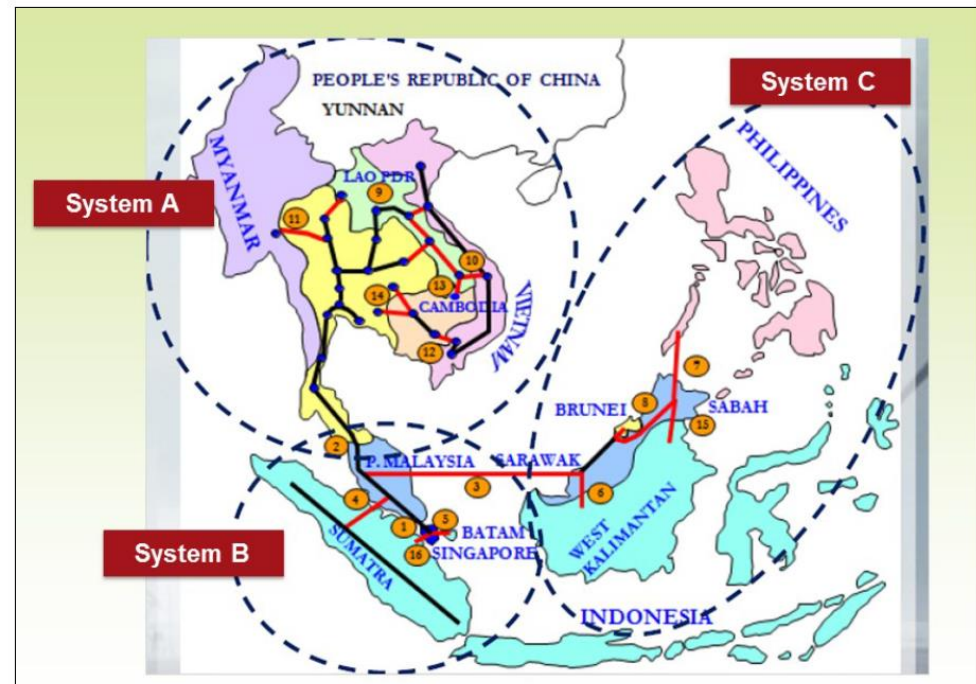
4

ASEAN integration

Harmonisation, physical linkage, commercial linkage



Source: ST, Peninsular Malaysia Electricity Supply Industry Outlook, 2017



Source: NGCP, Transmission Development Plan (Philippines), 2014-15



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