

Targeting Electricity Subsidies in a Competitive Market Framework

The Singapore Experience

Energy Market Company

- Singapore's Power Exchange since 2003
- Transition from day-ahead market to real-time market in 2003
- Nodal Pricing - calculated for individual nodes based on demand, supply and congestion using CPLEX algorithm
- Gross pool market with no PPAs, centrally cleared by EMC

Idea of Subsidy

“A benefit given by the government to remove some type of burden generally with the aim of promoting economic and social policy.”

Effects of Subsidies

Positive Effects

- Redistribution of wealth
- Manage rising costs of living
- Encourage consumption of certain goods/services (e.g. education)

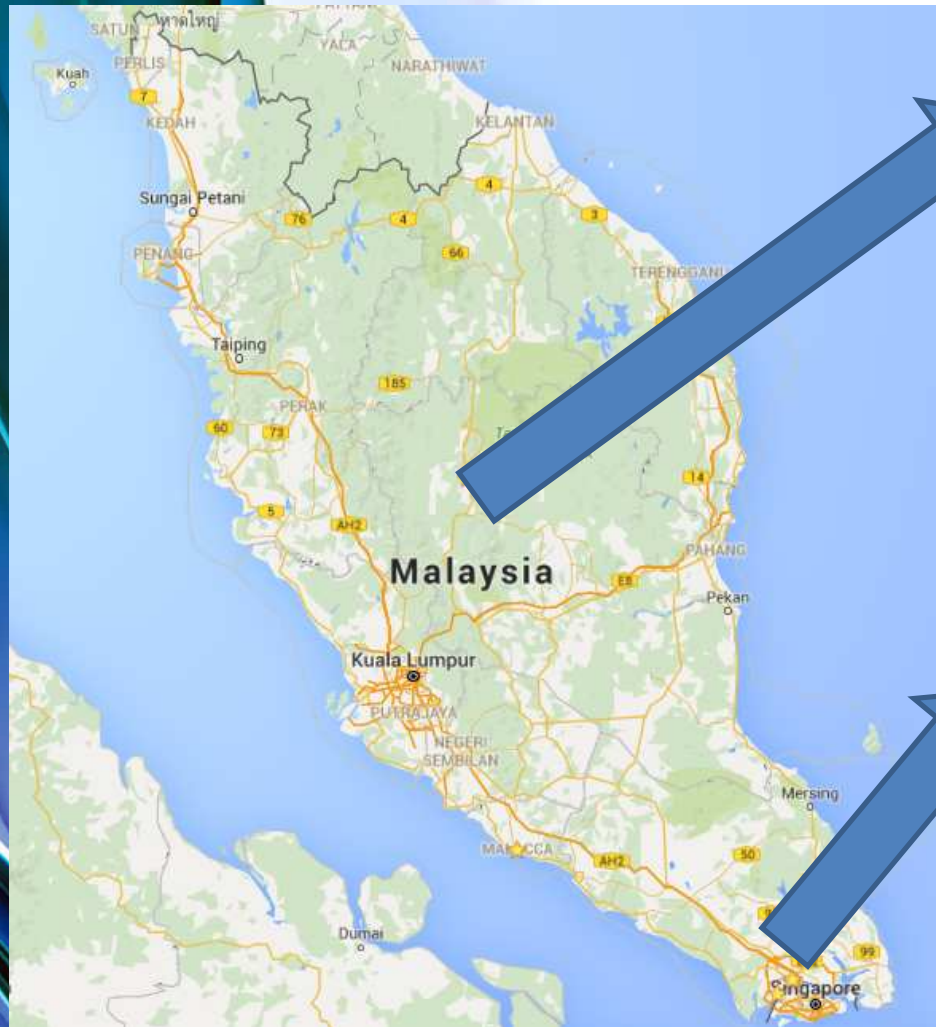
Negative Effects

- Cost to State
- Encourage inefficient production or consumption

Challenges of Subsidies

- Maximising positives; minimising negatives:
 - Subsidies that are targeted to the **right socio-economic groups**
 - Subsidies that are **sustainable and predictable** for the Government
 - Subsidies that do not distort investment/production/consumption decisions → **requires correct price signals**

Different Approaches



Malaysia

- Fuel Subsidies
- IPP model with long-term contracts

Singapore

- No fuel subsidies
- Wholesale competition since 2003

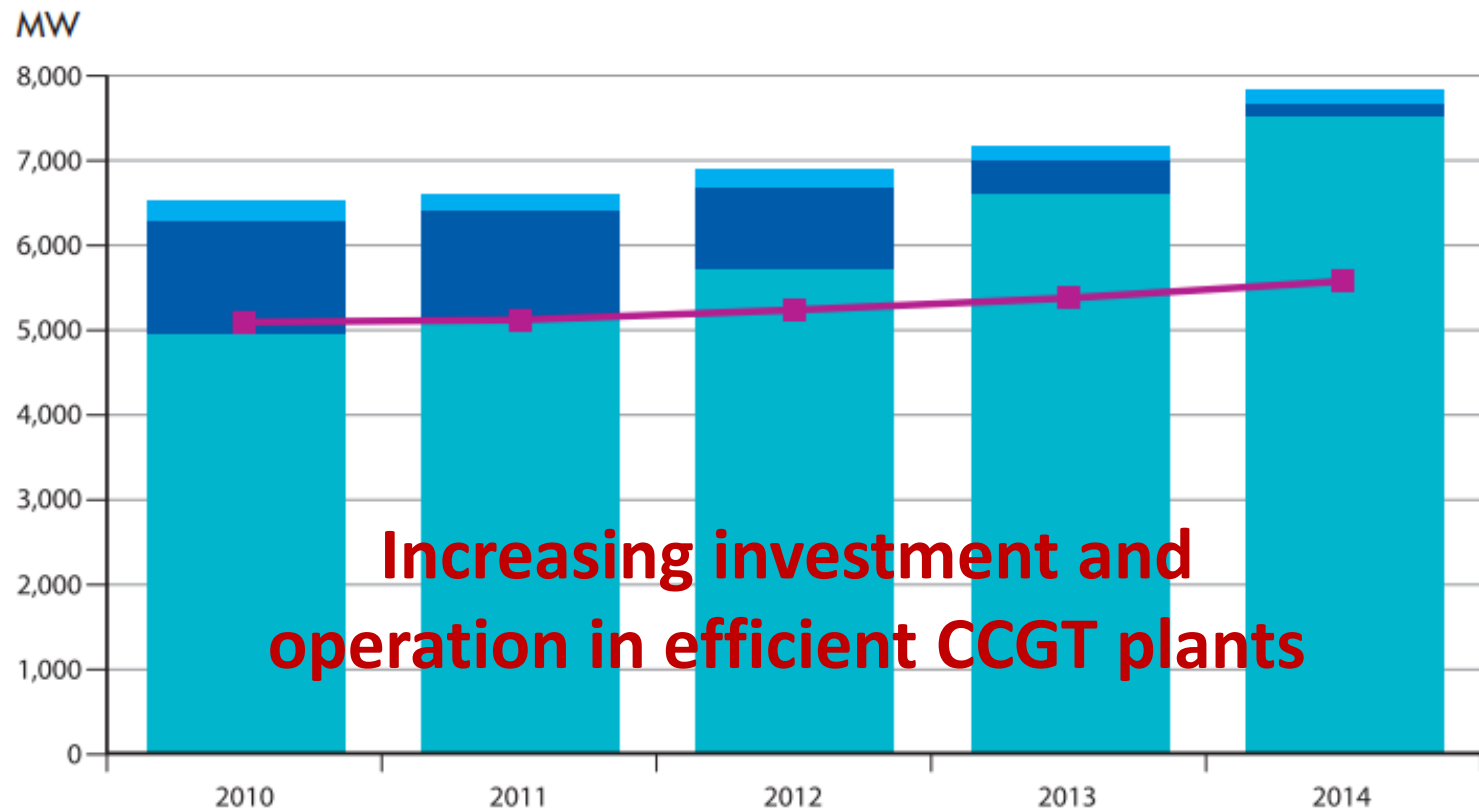
Situation in Malaysia

- Poor customer awareness of true cost of electricity
- No incentive to invest in efficient capacity
- Tenaga Nasional (National Energy Provider) undervalued relative to peer group
- Post expiry of PPA, IPPs have no route to market even as assets are still valuable

Situation in Singapore

Annual Generation Supply by Plant Type 2010 – 2014

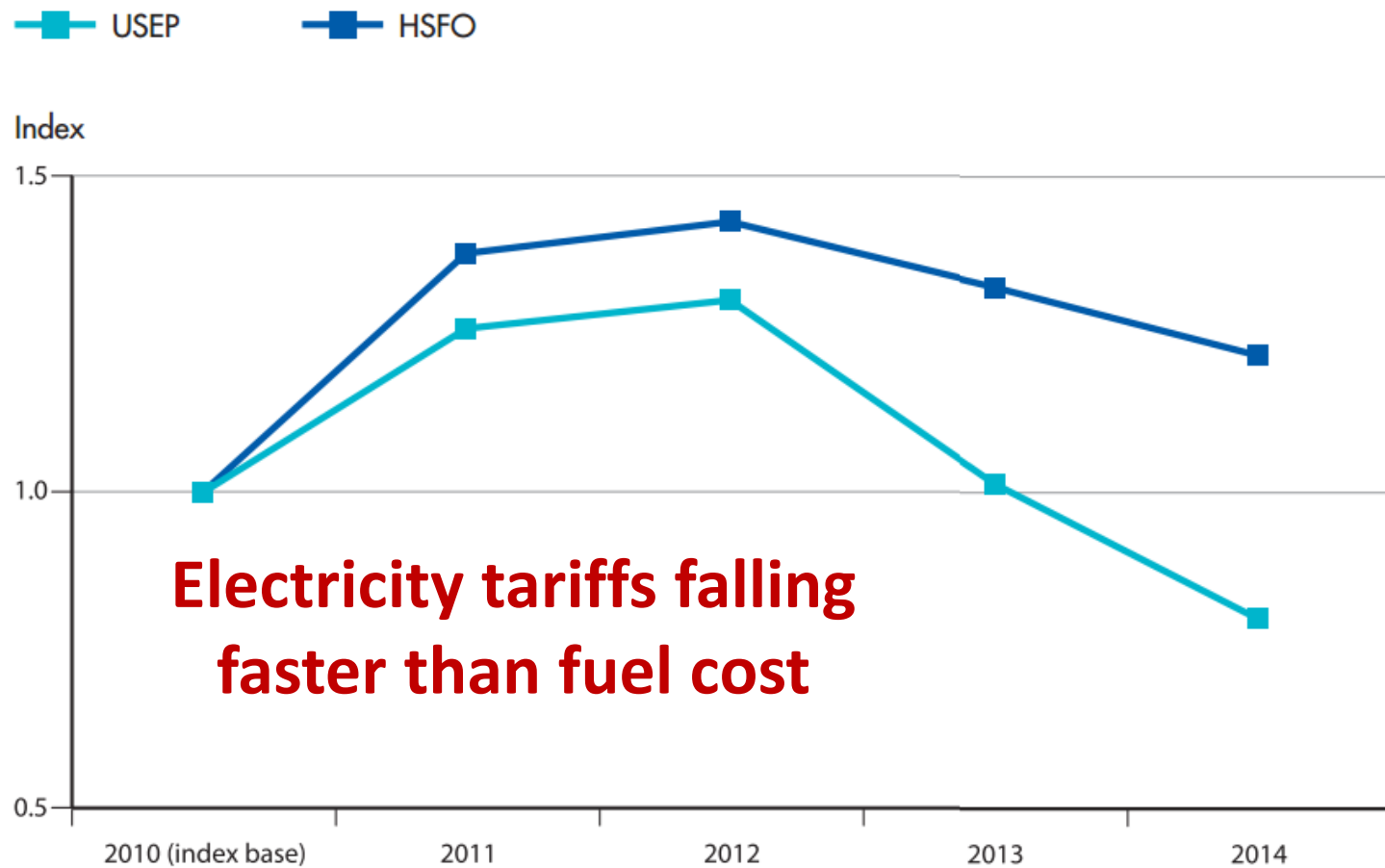
■ CCGT/Cogen/Trigen ■ ST ■ GT —■— Forecasted Demand



Increasing investment and operation in efficient CCGT plants

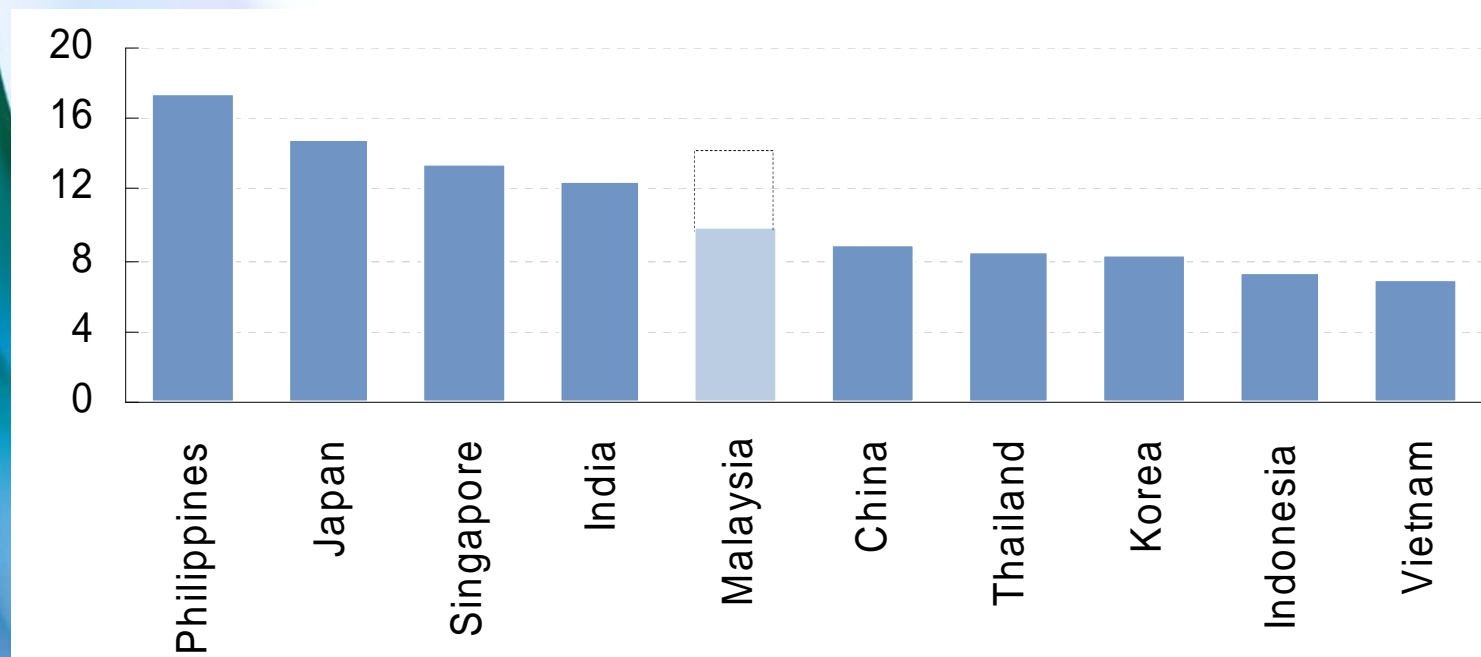
Situation in Singapore

Annual USEP and Fuel Price (HSFO) Movements 2010 – 2014



Power Price Comparison

US cents / kWh

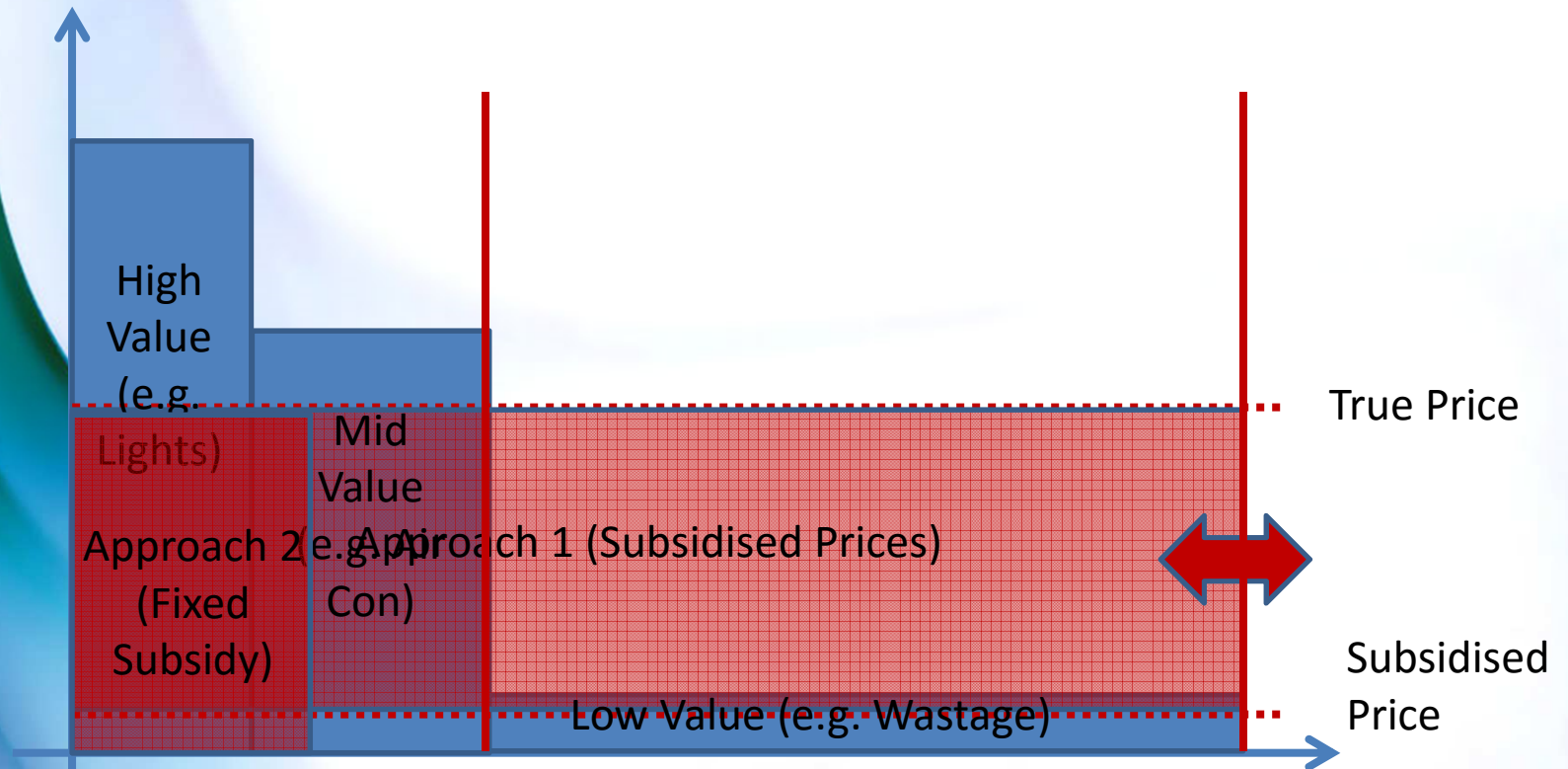


Malaysian power prices, adjusted for subsidies, appears high

Bilateral Export to Malaysia

- April 2011 – Malaysia (Tenaga) approached Singapore to buy electricity to tide over capacity shortages
- Commercial deal struck with YTL Powerseraya to provide electricity for the month of May
- Electricity **not supplied from most efficient plants**, to minimise pricing impact on Singapore

Singapore's Subsidy Approach



- Approach 1 (Subsidised Prices) – Wasteful consumption, unpredictable
- Approach 2 (Fixed Subsidy) – No wasteful consumption, predictable, can be calibrated

Utility Subsidy in Singapore

- Singapore adopts Approach 2 – fixed subsidies that **do not affect electricity prices**
- U-Save: Direct credits into utility accounts of households, with Singapore
- Consumers still pay full price (in form of cash or U-Save credits), so no wasteful consumption or distortion

Direct Credit: Singapore's Experience

- Subsidy amount targeted to demographic
- Predictable and easily calibrated

Housing Type	Amount Per Year (US\$)
1- and 2-room	\$185
3-room	\$170
4-room	\$157
5-room	\$143
Executive	\$129
Private Housing	\$0

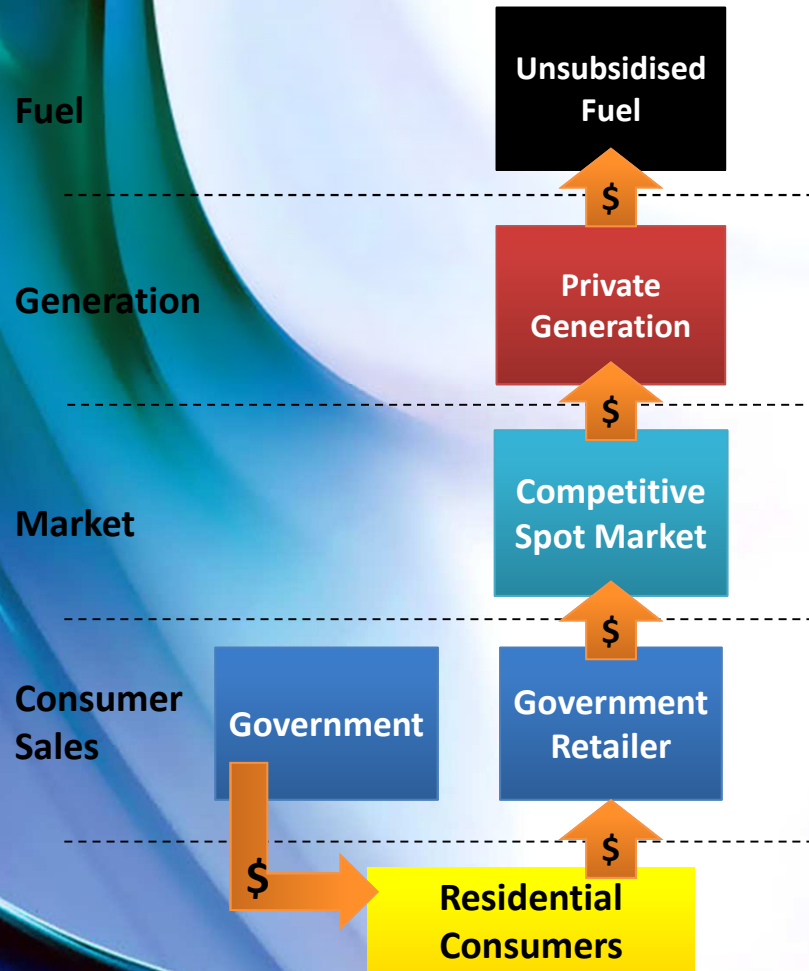
Increasing
Wealth



Increasing
Subsidies



Direct Credit Implementation in Singapore

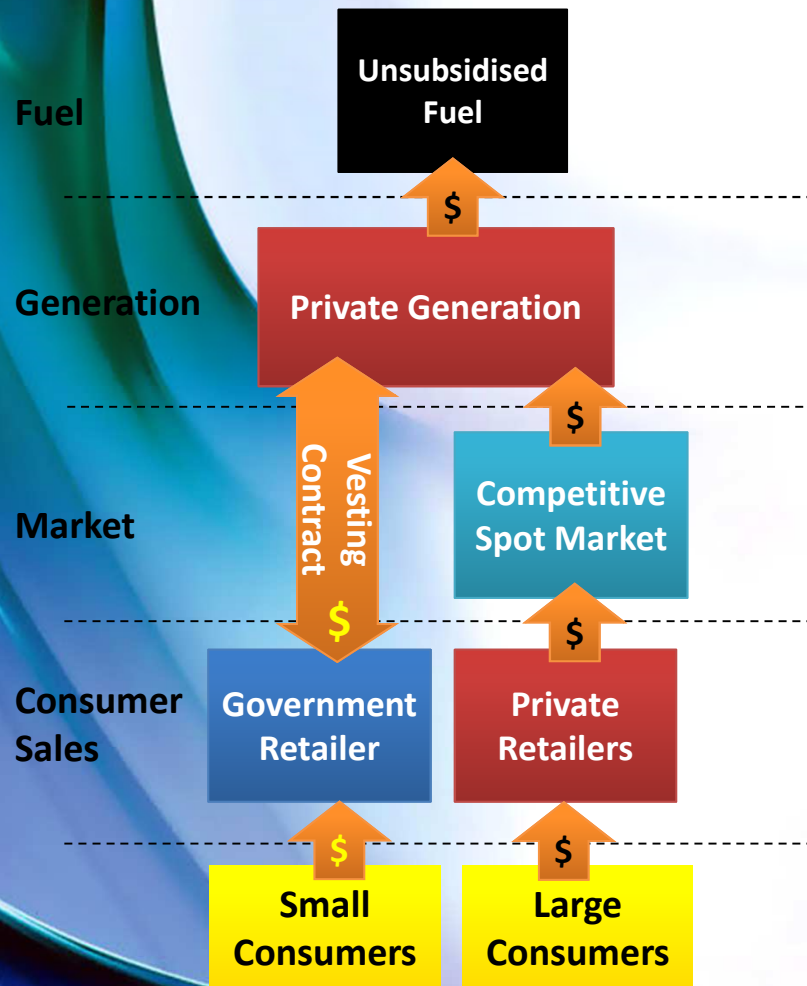


- Unsubsidised fuel from LNG/PNG gas imports
- Private generation compete to produce in competitive spot market
- Prices in competitive spot market are true economic prices
- Consumers receive fixed subsidy from Govt, pays for excess consumption to Retailer

Vesting Contracts in Singapore

- Introduced to curb market power of generators (3 gencos owning >80% of generation)
- Gencos to sell at **FIXED PRICE** and **FIXED QUANTITY** to government retailer
- Prices determined annually based on fuel costs, investment costs etc.

Vesting Contract Implementation in Singapore



- Generation sells into competitive spot market at market price
- Private retailers buy and sells on to Large Consumers (e.g. industries)
- Vesting contracts ensure Generation sells to Govt Retailer at reasonable fixed prices, passed on to Small Consumers (e.g. households)

Vesting Contracts in Singapore

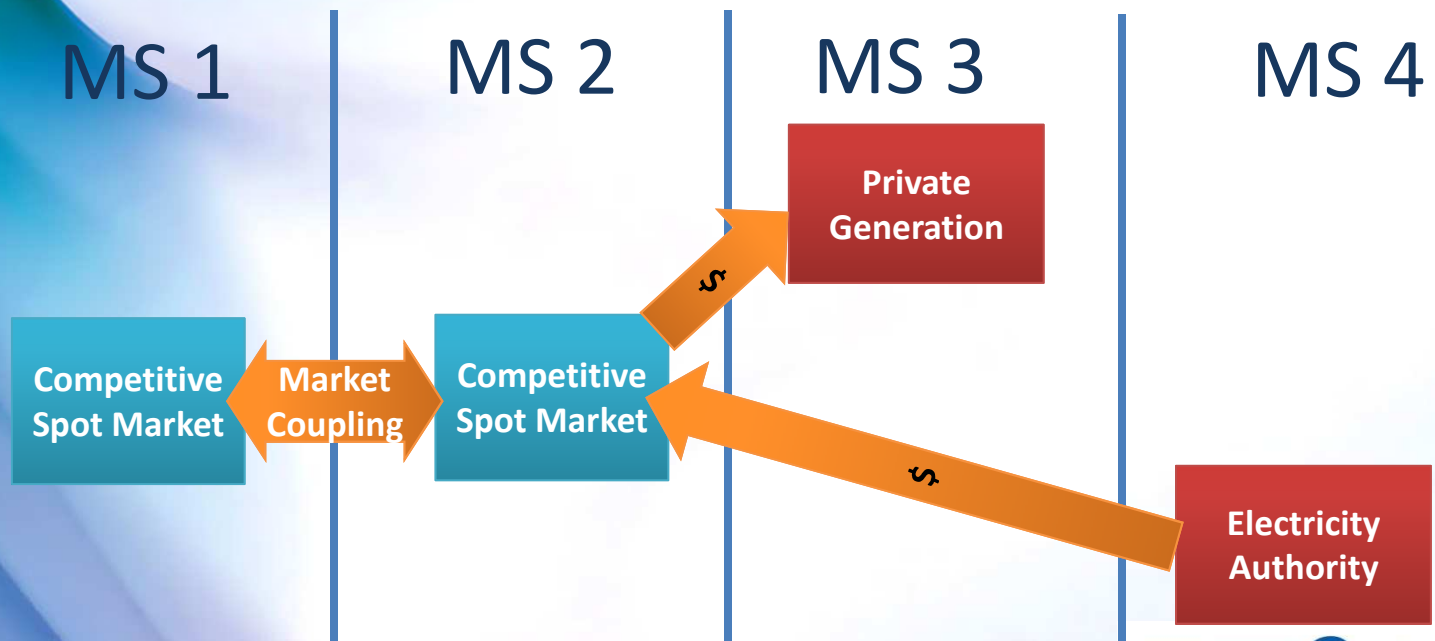
- Prices are determined by Government, can build in implicit subsidies for Small Consumers
- If so:
 - Gencos to recover from profits in Competitive Spot Market
 - Reduces amount of explicit subsidy funding that Govt has to come up with

Summary of Singapore's Approach

- Subsidies should not distort prices and affect investment/production/ consumption decisions
- Subsidies should be predictable and calibrated
- Subsidies can co-exist in competitive market framework
- Prices in competitive spot market should **reflect true cost** of producing electricity

Thoughts on GCC

- Pace/Path of development sovereign to individual MS
- No need for full spot markets to develop in all states before trading can take place
- Need market reflective of true prices, and consistent interface



Thank You