



Bringing LNG to the Philippines

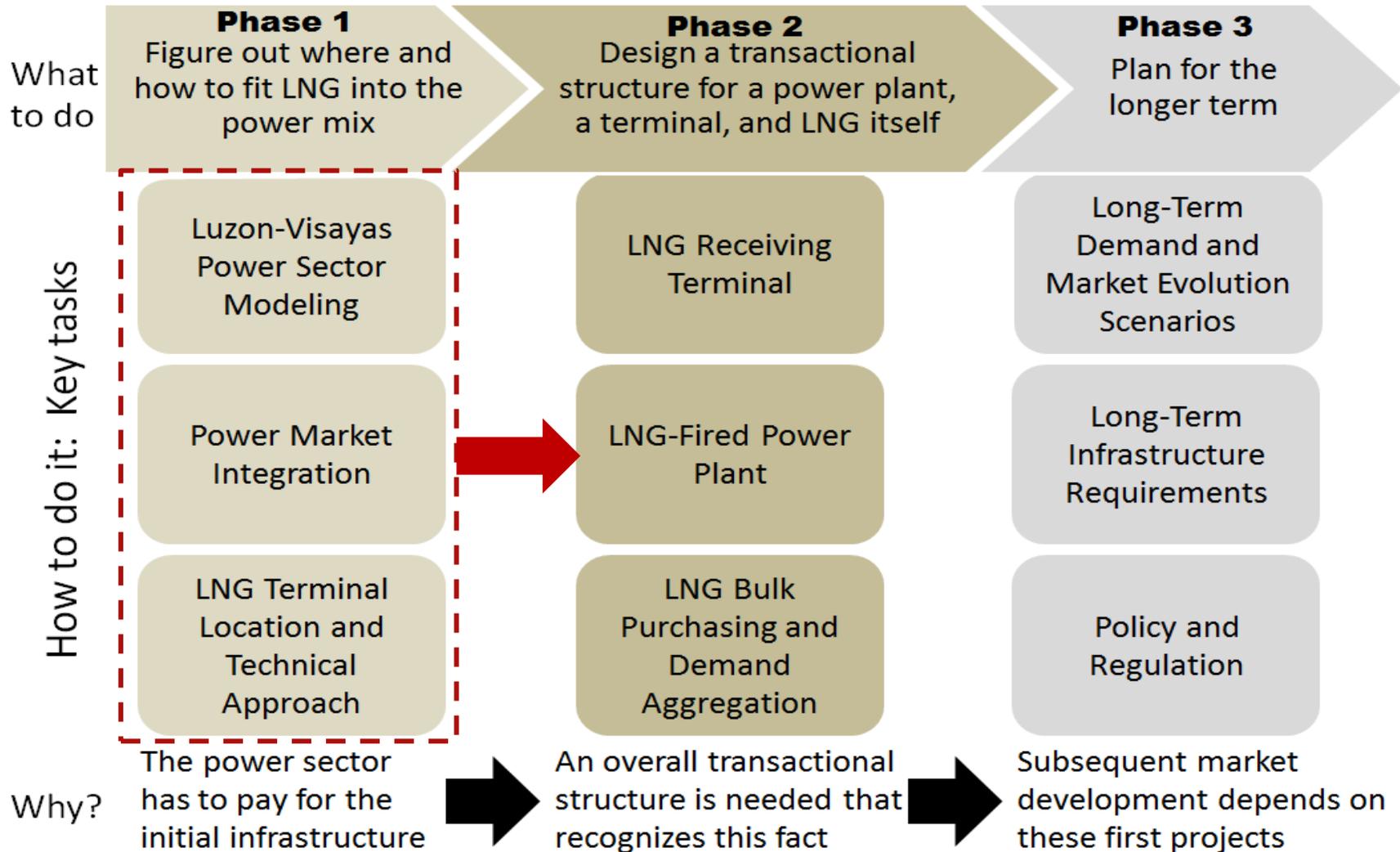
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Prepared by:

In this presentation, I will discuss our development of the “Philippine Gas Master Plan” (prepared for The World Bank and supported by Australian Aid)



Overview

1 Commercial potential for LNG

2 Legal constraints on policy

3 Challenges of market failures

4 Alternative policy options

5 Our preferred approach

6 Implementation plan

7 Lessons for SE Asia

The commercial potential for LNG in the Philippines

- Most of the potential LNG demand comes from the power sector:
 - To back up existing power stations now; or fuel existing power stations after 2024
 - Fuel for new power stations from 2017 onwards
- Backing up existing power stations is worth about USD 20-25 million per annum until 2024
- There is an economic case for about 600-800 MW of new power stations, running mid-merit
 - Highly variable gas demand due to variations in annual rainfall (hydro), outages, and weather (El Nino)
 - No economic case for new baseload gas fired power stations – coal is always a cheaper option for baseload, even after factoring in possible carbon credits
- Small but potentially growing demand for gas in industry and transport

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Power sector policy has to deal with the constraints of EPIRA

- EPIRA is the Philippines Electricity Act
 - Governs the way the electricity industry was to be privatized and operated in the future
 - Prevents Government from funding new power stations or offering guarantees
 - Essentially means that no more Government-backed PPAs are available
- EPIRA means that both new and existing power stations must be privately owned and compete against other forms of generation for space in the market
 - Removes many levers the Government might have to make gas “special”
 - Accordingly, gas-fired generation must survive on its economic merit
- Privately-owned power stations need to be bankable
 - Need offtake contracts with credit-worthy retailers
 - These contracts must be approved by the regulator

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A number of possible market failures could inhibit gas-fired development

- Environmental impacts not internalised in the market
 - Coal can cause higher emissions of SO_x, NO_x, particulates and CO₂ than gas but there is currently no mechanism in the Philippines to take into account these impacts on the local and global environment.
- Maturity of market
 - With retail access (RCOA) only recently adopted and no financial derivative contracts available, contract purchasing strategies are not yet mature in the market. Distribution utilities have not yet embraced “portfolio planning” strategies that would favor the incorporation of mid-merit LNG-fired power.
- Regulation of contracts
 - To date, contract regulation has been mainly on a “cost-plus” basis that does not take account of market prices. As such, it makes it harder to highlight how mid-merit and peaking generation options fit into the mix compared to “cheaper” baseload coal.
- Diffuse benefits of gas options
 - There are many benefits of gas, but it is hard to ensure all the beneficiaries pay their share of the costs
- Clarity of rules on NG use and infrastructure
 - Improving clarity of rules for access will give players more certainty on their commercial deals.

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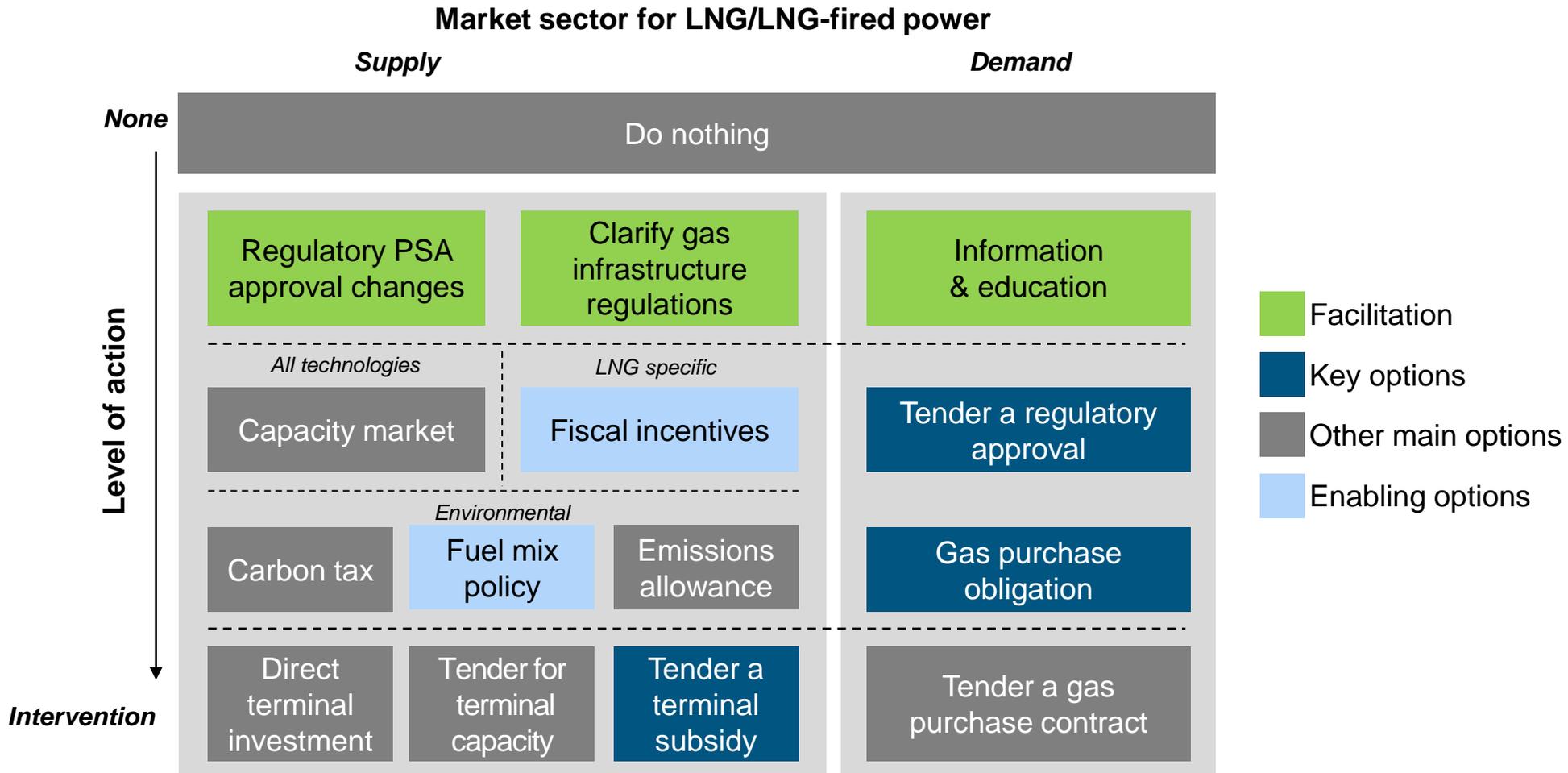
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Our matrix of options focused on mitigating these market failures



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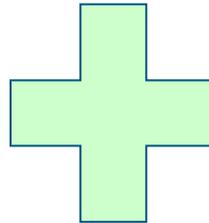
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Our “preferred option” has two components

Facilitation

- Improve regulation of power sector by creating economic justification for mid-merit plant within a balanced portfolio
- Clarify downstream gas regulations and tax situation
- Clarify LNG terminal regulations (or lack of them) to give terminal certainty
- Education and capacity building for distribution utilities
- Policy statements to support these initiatives



Transaction Structure

- Securing interest of FSRU developer
- Back-up service for Malampaya (paid for by regulated customers)
- Open Season to allow anyone else to purchase capacity in the terminal (on a competitive basis)
- Flexible LNG purchasing strategy arranged via a voluntary consortium of gas users

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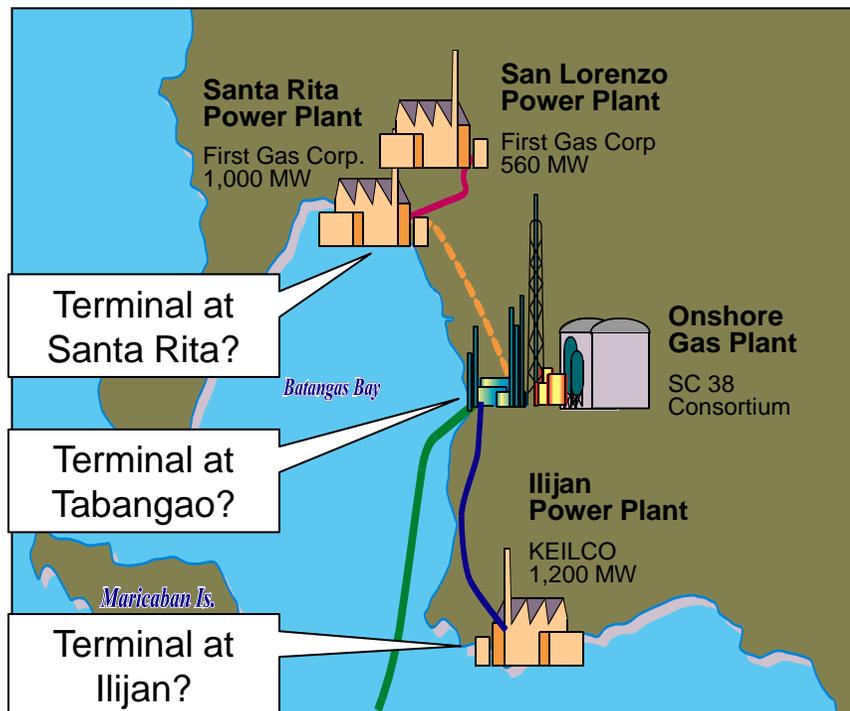
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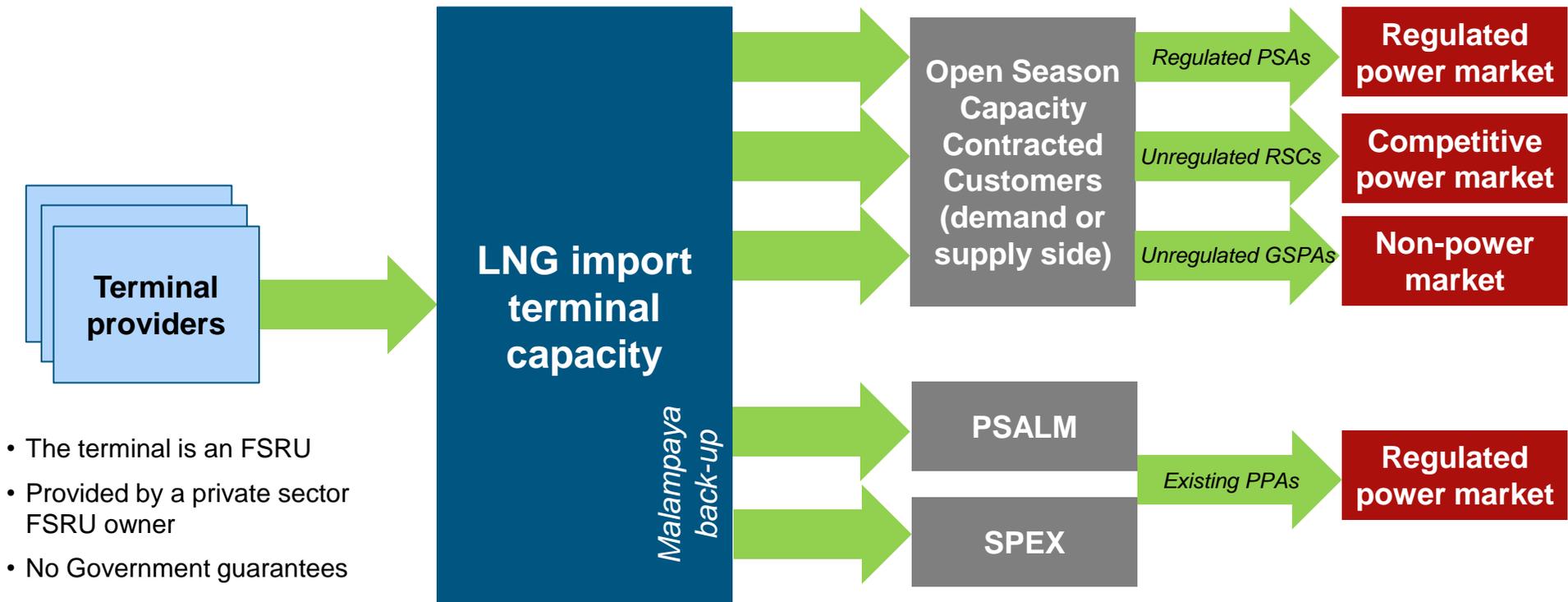
Near-term vision – an LNG terminal in Batangas to back up Malampaya with balance of capacity for market

Three possible sites for LNG terminal connecting directly to Malampaya



- Recognised case for Government action to solve market failures in providing Malampaya backup
- Structure transaction around terminal
- Implement in phases
 - Test strength of market demand with indicative open season solicitation
 - Conduct tender for FSRU operator
 - FSRU operator then conducts open season auction process
 - If auction fails, revisit options for integrating LNG import with power sector (e.g., renewables portfolio standard)

The commercial structure mixes regulated and competitive value streams



- The terminal is an FSRU
- Provided by a private sector FSRU owner
- No Government guarantees

Gas purchasing would be separate from terminal infrastructure

- Sellers of gas would be able to purchase terminal capacity in the open season
 - No franchise for any single buyer or seller
- Buyers of gas would be encouraged to aggregate to tender for known gas supplies
 - Aggregation and tendering should prevent less experienced buyers being disadvantaged in the LNG market
 - Tendering should make it easier to demonstrate least-cost purchasing for regulatory approvals
- Gas purchases may be on a mix of long, medium and short-term basis, but must emphasis flexibility
 - Ensure diversion of cargoes to avoid being locked into high take-or-pay levels

There is still more to do on our Gas Master Plan

- Phase 2 report was delivered 3rd March
- Public consultation on 20th March
- Next steps include:
 - Confirming Government is happy with recommendations
 - Discussing with private sector participants the details of where the FSRU would be docked and what other infrastructure would be required
 - Discussing the implementation of a preliminary “open season” to identify potential purchasers of capacity in the terminal
 - Finalizing the Master Plan document

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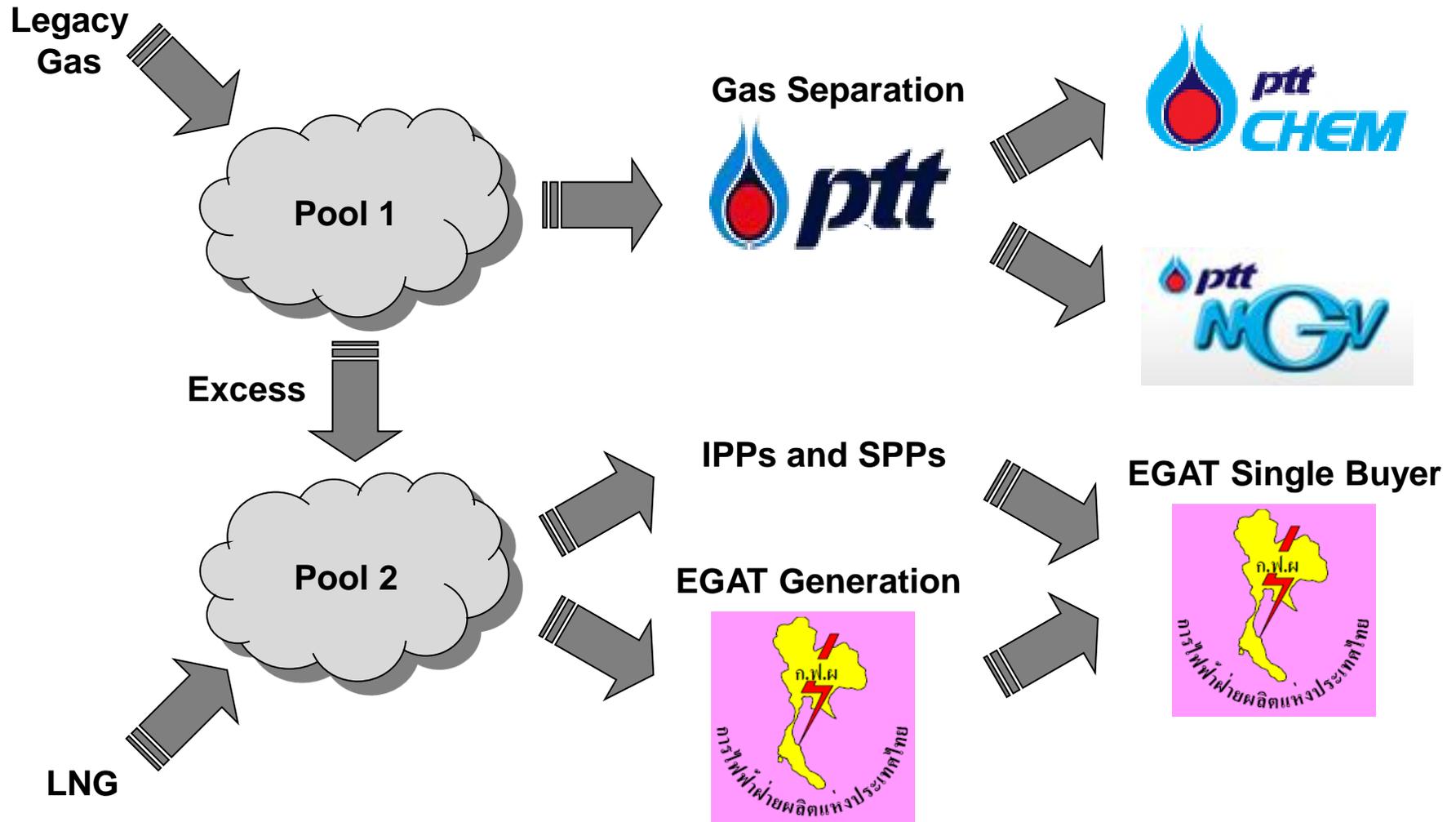
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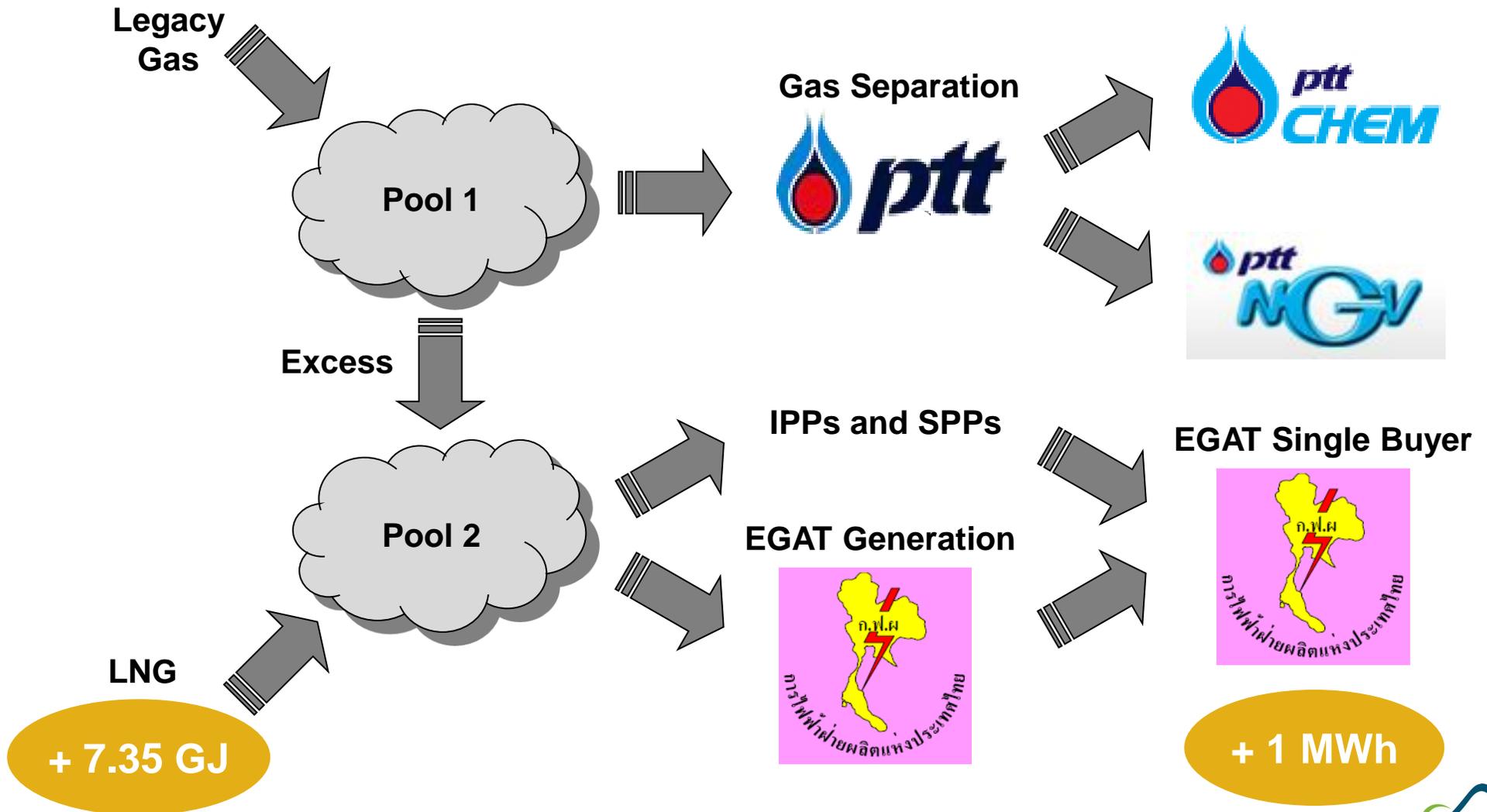
SE Asia faces a new “natural gas reality”

- Many SE Asia countries use natural gas extensively for baseload generation
- As domestic supplies dwindle, they are importing LNG (or planning to do so) to meet incremental gas demand
- Unlike the Philippines, these other countries have “Single Buyers” that can make direct infrastructure investments and control gas pricing
 - Thailand (PTT)
 - Vietnam (PV Gas)
 - Malaysia (Petronas)
 - Indonesia (PGN)
- These Single Buyers can “roll in” the incremental cost of LNG to their weighted-average cost of gas (WACOG) and thereby mitigate price increases
- But WACOG pricing does not change the fundamental marginal-cost economics – baseload gas-fired generation is no longer economic!

Example – Gas “pooling” in Thailand mitigates impact of LNG prices



But, despite pooling, the marginal cost of power generation is set by LNG price



Mid-merit LNG-fired generation is the wave of the future – and mid-merit generation cannot support the existing LNG economic value chain

- Coal, nuclear, and renewables will edge out gas as a baseload generation resource
- Mid-merit LNG-fired generation will be subject to daily load variation, seasonal swings, and long-term capacity factor uncertainty
 - Cannot support high load factor for LNG terminals
 - Cannot live with inflexible take-or-pay commitments
 - Cannot sign bankable long-term supply contracts
- LNG terminals will be forced to recover their costs primarily via capacity reservation charges, rather than throughput charges
 - Throughput capacity will vary with circumstances
 - Sizing of terminal storage capability will be the key design variable
 - Break-bulk shipping and LNG trucking – both inherently more flexible – will supplant gas pipelines
- LNG aggregators will act as financial intermediaries between LNG liquifaction projects and downstream customers (e.g., mid-merit CCGTs)
 - Buying shares in liquifaction projects
 - Taking positions in LNG tankers
 - Securing LNG storage capacity



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