INDEPENDENT MARKET OPERATOR

Development of a Wholesale Gas Market in Western Australia

Kate Ryan, Group Manager, Development and Capacity

16 July 2014

Introduction

Background

High Level Market Design

Next Steps

Governance of the Gas Services Information

The Gas Bulletin Board (GBB) and Gas Statement of Opportunities (GSOO) for the Western Australian gas market came into operation in 2013.

The IMO is responsible for:

- administering and operating the GBB and preparing and publishing the GSOO
- maintaining and developing the rules and procedures that govern the GBB and GSOO

The Gas Advisory Board (GAB) is made up of representatives from the WA natural gas market and is responsible for advising the IMO on the development of the GSI rules, operation of the GBB, preparation of the GSOO, rule changes, and procedure changes.

GAB Members

Member	Representing
Allan Dawson	Chair
Kate Ryan	Independent Market Operator
Stewart Gallagher	Gas Producer
Pete DiBona	Gas Producer
Mark Cooper	Pipeline Owner and Operator
John Jamieson	Pipeline Owner and Operator
Mike Lauer	Gas Shipper
Andrew Sutherland	Gas Shipper
Mike Shaw	Major User
Ian Mumford	Major User
Ray Challen	Coordinator of Energy
Aden Barker	Small End-Users (appointed by the Minister)
Nerea Ugarte	Observer (appointed by the Minister)
Elizabeth Walters	Economic Regulation Authority (observer)

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Overview of the Project

Initiation

- October 2013 – GAB discussed next steps after the GBB and GSOO
- Members requested IMO to investigate options for a gas market in WA

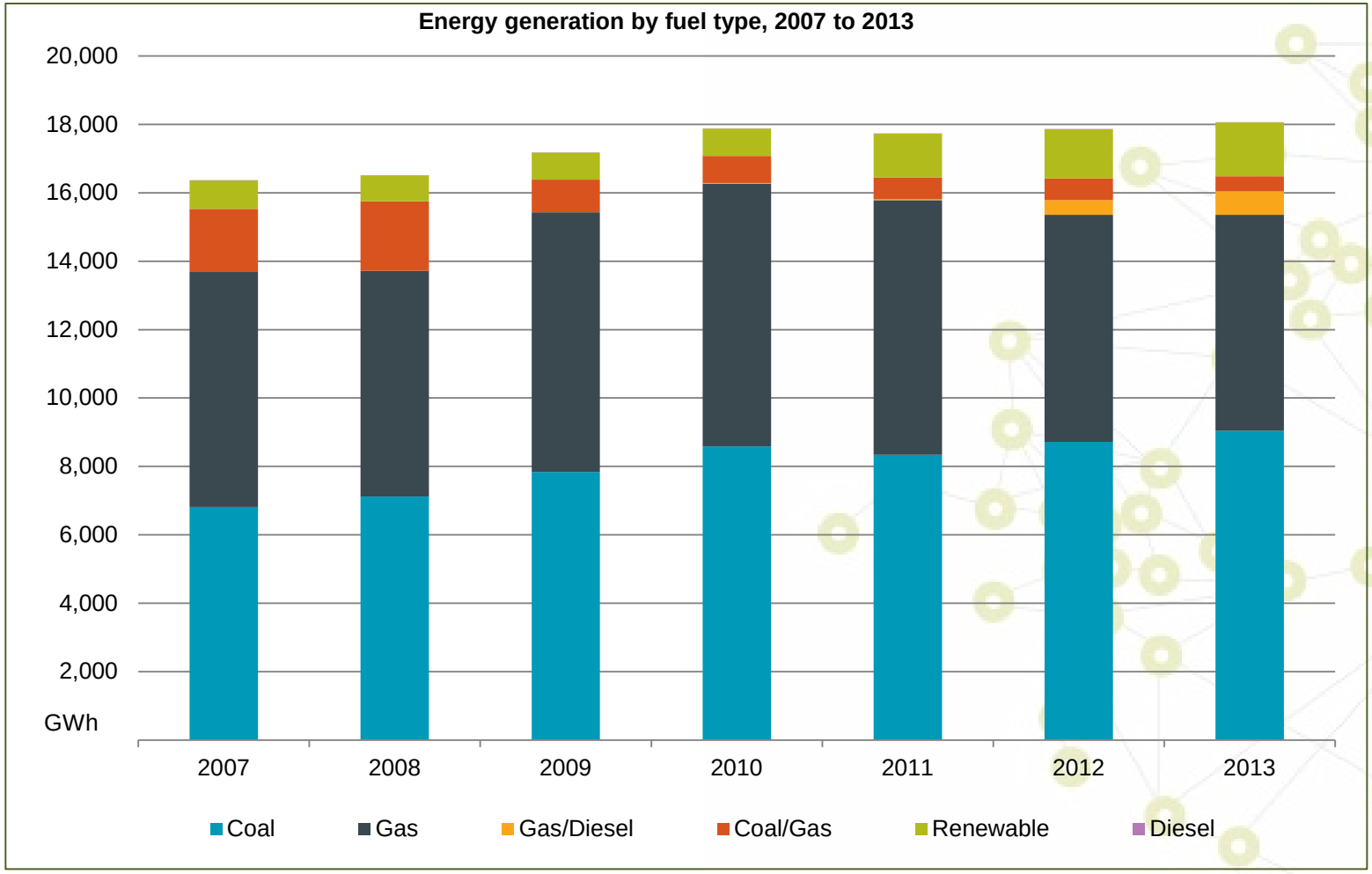
Challenges

Current trading mechanisms do not meet the needs of all potential participants:

- level of independence
- level of transparency
- financial security
- sufficient liquidity of the currently traded products

Opportunity

- new supplies expected over the coming years
- a trend toward shorter gas contracts
- the need for access to flexible gas supplies


Energy generation by fuel type, 2007 to 2013
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
GWh
2007
2008
2009
2010
2011
2012
2013
Coal
Gas
Gas/Diesel
Coal/Gas
Renewable
Diesel

Progress To-Date

January 2014	IMO engaged Market Reform to assist with GAB's request
February 2014	GAB discussed benefits of developing a WA market and key elements
March 2014	Informal discussions held with GAB members/observers
May 2014	GAB discussed high level design options and requested further consultation
June – July 2014	Informal discussions with range of Gas Market Participants Industry workshop

Summary of Views

Throughout consultation two main views have been expressed:

1. current trading mechanisms are effective and there is no need for intervention

2. current trading mechanisms are inadequate and an alternative should be developed to facilitate increased participation and liquidity

Purpose of this Workshop

1. Discuss the merits of developing an independent wholesale gas market in WA
2. Discuss the proposed high level deign

The IMO welcomes feedback

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MARKET REFORM

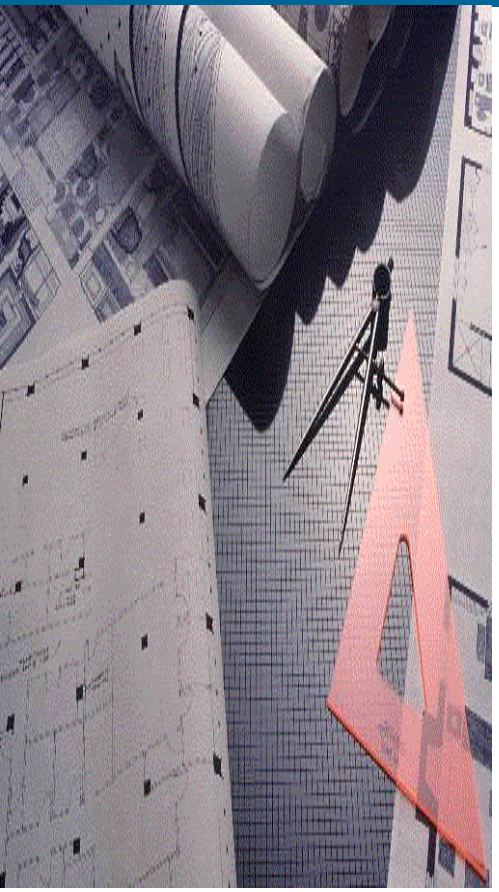
High Level Design for a Gas Market in Western Australia

Industry Workshop

Trent Morrow, Market Reform

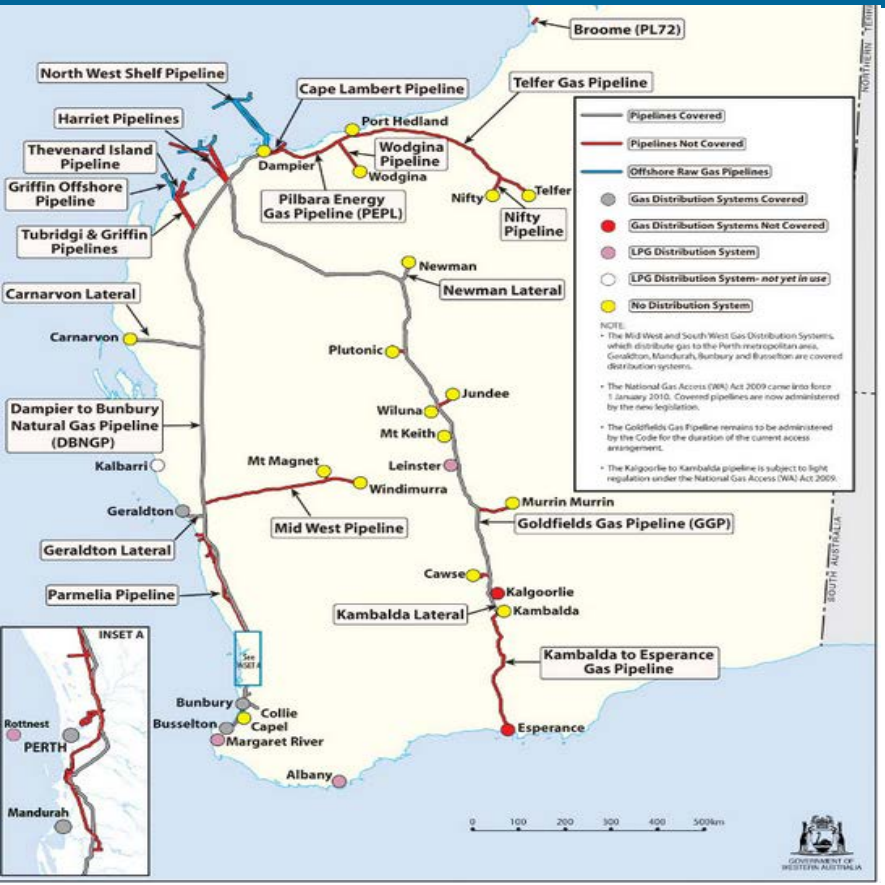
16 July 2014

Outline



- Characteristics of WA Gas Market
- Drivers for a Gas Market
- Guiding Principles
- Gas Market Models
- High Level Design of Gas Market for WA:
  - Participation,
  - Hub Locations,
  - Products, Pipeline Capacity Trading
  - Trading Mechanism
  - Gas Delivery Mechanism
  - Settlement & Prudential

Characteristics of WA Gas Market



- Main **gas supply source** is geographically distant from the main domestic gas **demand locations**.
- Gas **transmission pipelines** are managed by a number of different companies under their own commercial arrangements.
- The bulk of demand is **industrial** and **power generation** and is served directly from transmission pipelines rather than distribution networks.
- Link to global markets through **LNG exports.**

Drivers for a Gas Market

- Economic Efficiency and Transparency
  - Signal efficient production and use of gas.
  - Signal efficient utilisation and investment in infrastructure.
  - Transparent gas pricing aids decision making.
- Facilitate pipeline capacity trading
  - Efficient utilisation and allocation of capacity.
  - Reduce risk associated with long term investments.
- Portfolio management
  - Short term portfolio management around long term contracts.
- Reduced transaction costs
  - Match buyers and sellers of standardised products.
  - Centralised settlement, robust prudential process.
  - Streamlined gas delivery processes.

MARKET REFORM

Guiding Principles

Market Benefits

- Facilitate competition
- Maximise participation
- Enhance transparency

Workings of Market

- Minimise transaction times and costs
- Anonymous trading
- Full collateralisation of settlement risks
- Consistency with existing trading conventions

Market Implementation

- Avoid the requirement to change gas pipeline arrangements
- Independent governance of trading arrangements
- Minimise system impacts on participants
- Cost recovery linked to participation

Gas Markets: Eastern Australia

Victorian Gas Market:

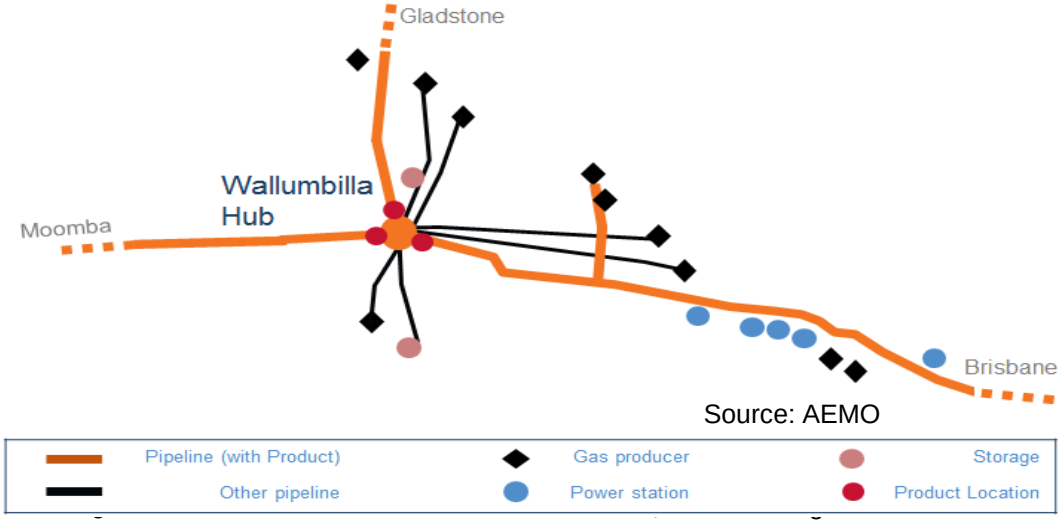
- Overlays the Victorian Transmission System.
- AEMO centrally schedules all injections and withdrawals into the network.
- Intraday market and operational schedules based on market bids.

STTM:

- Hubs in Sydney, Adelaide and Brisbane.
- Gas users and shippers trade at the intersection of the transmission and distribution network.

Gas Supply Hub:

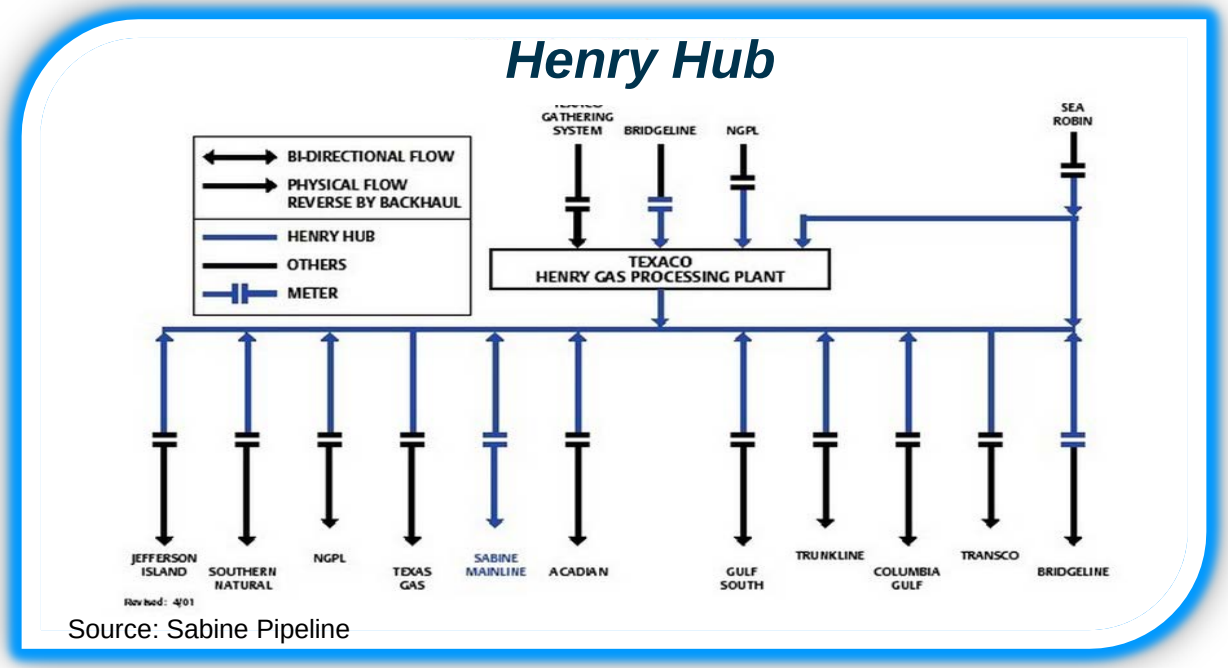
- Wallumbilla is a production centre and transmission pipeline interconnection point.
- Exchange for voluntary wholesale trading of physical gas products.



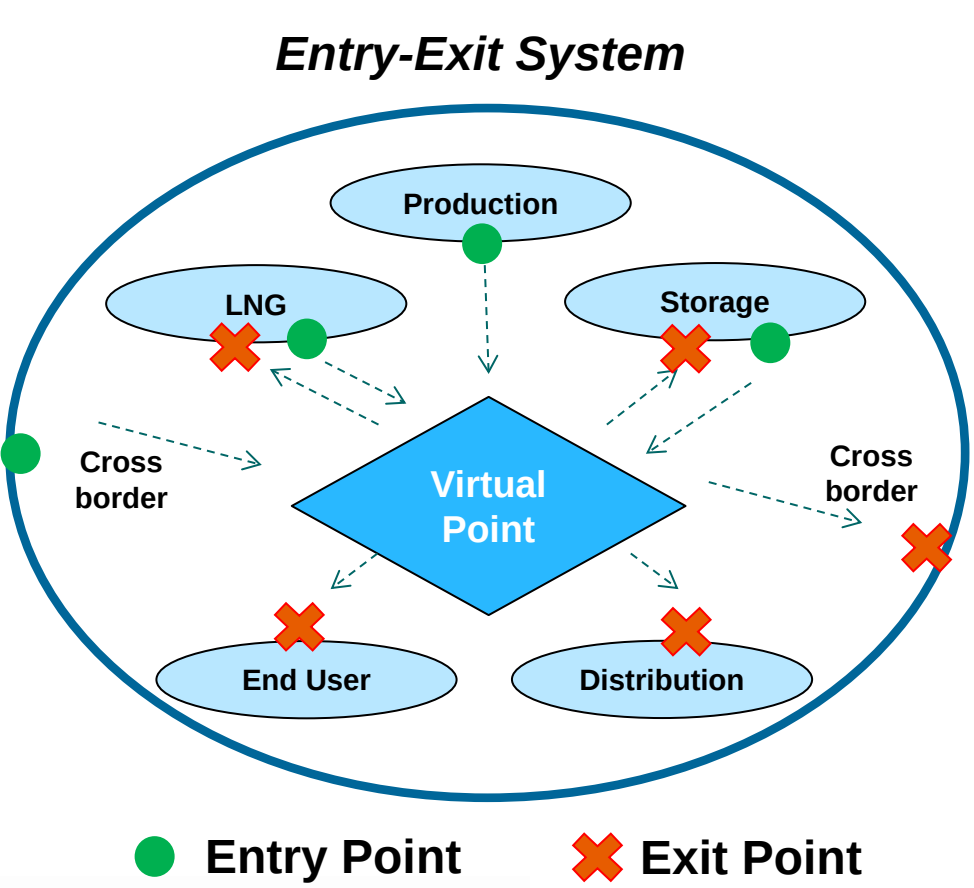
Source: AEMO

Gas Markets: US

- The US has a large network of pipeline systems and gas hubs.
- Gas hubs are typically a location with a significant concentration of supply, storage or a major trans-shipment point.
- Convenient and efficient location for the delivery of trades.
- Gas hubs support trading and shipment of gas.
- Facility operator provides services to support trading:
  - Intra-hub transfer.
  - Title transfer.
  - Park, loan and storage.



Source: Sabine Pipeline



Entry-Exit System: System covers national gas network.

Entry Points, Exit Points: Cross-border, LNG, Production, Storage, End Users.

Virtual Hub: Single market place for trading of commodity for all users.

Balancing: Across all entry and exit points.

Examples: National Balancing Point in UK, Title Transfer Facility in Netherlands.

Capacity Trading: Cross-border pipeline capacity:

- Standardised capacity products.
- Central platform, transfer services.
- Congestion management.

High Level Design
Proposed Market Model

- A physical *gas trading hub* is proposed for WA due to:
  - the concentration of supply,
  - distributed nature of gas demand (rather than being concentrated around a distribution network), and
  - the principle of a simple market design that minimises the impact on existing contractual arrangements.

- Base and Extended Models outlined in the high level design.
  - *Base Model:* proposal for the market.
  - *Extended Model:* potential market development options.

High Level Design
Participation

- Voluntary participation.
- Trading Participants must have capability to deliver gas to the hub or to receipt gas from the hub.
- Role of Market Operator
  - register participants, implement and operate a trading platform, settle transactions, monitor settlement exposures and hold credit support.
  - Opportunity for IMO to leverage existing capabilities and facilities.
- Role of Facility Operator
  - Schedule and allocate gas deliveries in accordance with existing contracts.
  - Participation in the market is beneficial but not essential.

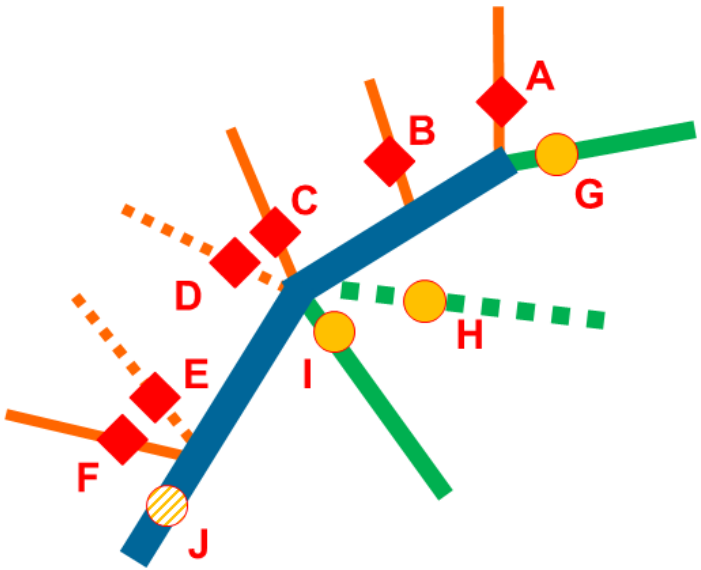
MARKET REFORM

High Level Design
Gas Trading Hubs

- Establish at least one gas trading hub based at:
  - the ***Carnarvon Basin*** gas fields, and / or
  - ***Mondarra Gas Storage Facility***.

  Confirm during detailed design phase.
- Pool together potential buyers and sellers to maximise liquidity.
- Utilise existing gas delivery and title transfer services.
- Market should support growth in services and investment in new infrastructure.

High Level Design
Carnarvon Basin Hub Characteristics



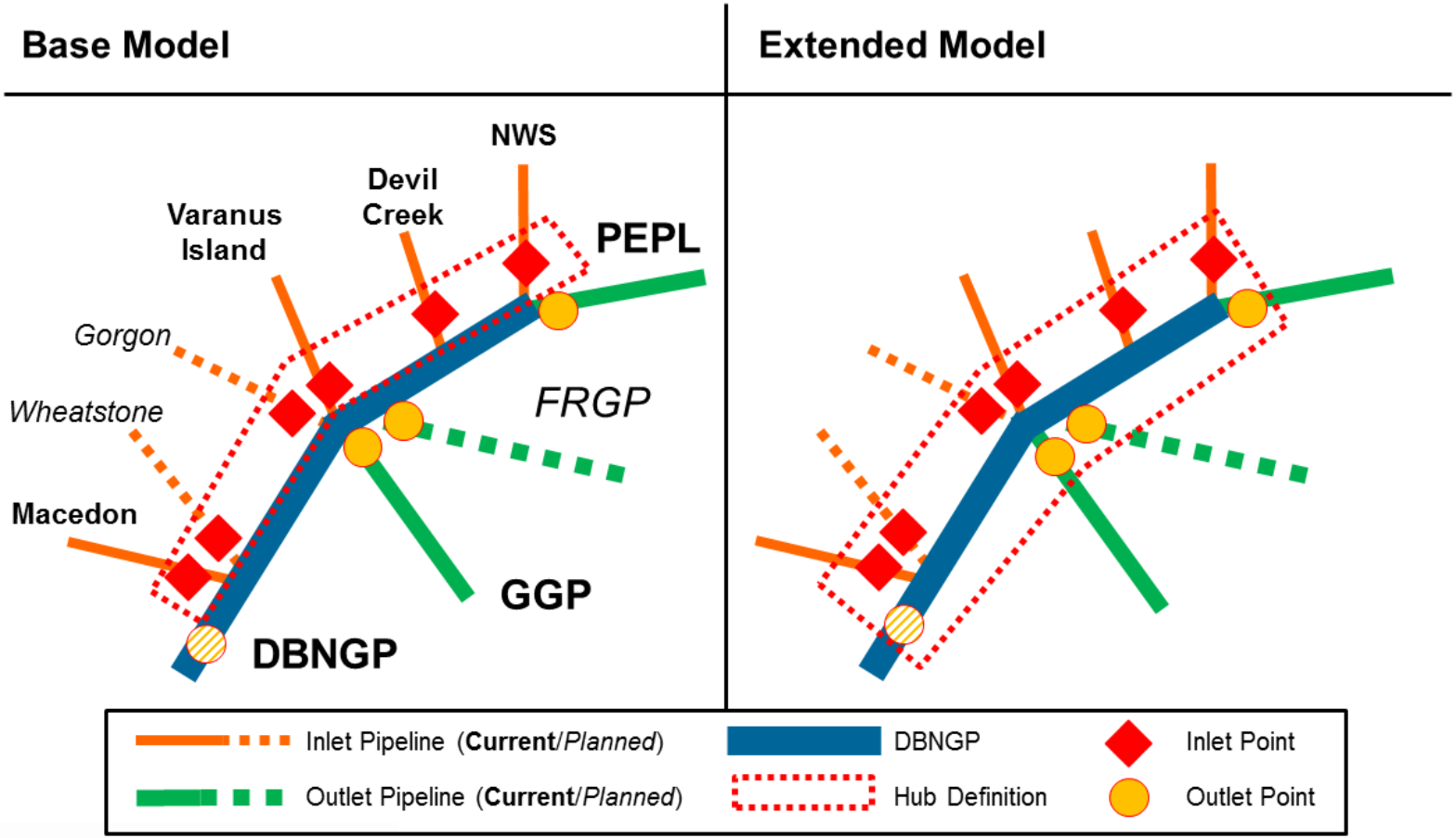
Inlet/Outlet	Processing Facility/Gas Pipeline
Inlets:	
A	Karratha Gas Plant (NWS JV)
B	Devil Creek (Apache)
C	Varanus Island (Apache)
D	*Planned: Gorgon (Chevron)*
E	*Planned: Wheatstone (Chevron)*
F	Macedon (BHPB)
Outlets:	
G	Pilbara Energy Pipeline (APA)
H	*Planned: Fortescue River Gas Pipeline (FRGP JV)*
I	Goldfields Gas Pipeline (APA)
J	Dampier to Bunbury Natural Gas Pipeline (DBP)

MARKET REFORM

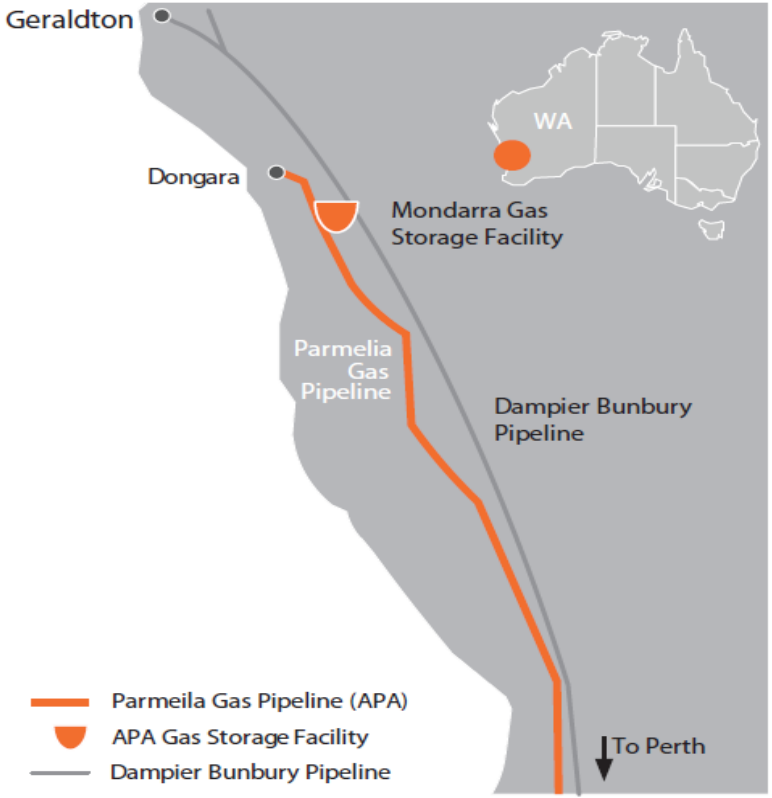
High Level Design
Carnarvon Basin Hub Definition Options

- ***Base*** Hub Definition – ***Carnarvon Basin***
  - Group together inlet points from the Carnarvon Basin gas fields.
  - Requires buyers to be able to receipt gas at each of the inlet points.
  - Potential issue for buyers if shipping costs are different for each of the inlet points.
- ***Extended*** Hub Definition – ***Pilbara region***
  - Requires intra-hub transfer service to ensure transactions between participants in different locations can be delivered.
  - Value in balancing service for the hub.
  - Value in hub operations – netting trades, coordinating deliveries.

High Level Design
Carnarvon Basin - Hub Diagrams



High Level Design
Mondarra Gas Storage Facility



Source: APA Group

- Mondarra Gas Storage Facility
  - Located at intersection of DBNGP and PGP.
  - 15PJ storage, 150TJ/d withdrawal into the DBNGP or PGP.
- Potential benefits of Mondarra hub:
  - Storage provides opportunity to buy gas when prices are low and supply gas when prices are high.
  - Connectivity to DBNGP and PGP.
  - Opportunity to meet balancing and short-term portfolio requirements.
- Hub definition:
  - Connection between DBNGP and MGSF could facilitate trading between shippers on both facilities.

High Level Design
Gas Balancing Arrangement

- Gas balancing service corrects for any under or over delivery to ensure that a transaction is delivered in full to the buyer.
- Balancing could be procured and maintained by facility operator or could be supplied by participants through a competitive market.
  - ***Pros*:** Increases reliability of delivery, avoids requirement for imbalance settlement mechanism.
  - ***Cons*:** Cost to implement and operate balancing arrangement.
- Balancing arrangements (OBA) exist at some inlet points to the DBNGP and supply point injections are understood to be close (< 5%) to scheduled flows.

Proposal: Utilise existing pipeline / storage facility balancing arrangements.

High Level Design
Products

- Products for physical gas delivery at a hub traded through the market.
- Market requires standard terms for trading, delivery and settlement.
- What delivery periods should be supported by the market?
  - Spot (*on-the-day, day-ahead*) and short-term forward (*day, week*).
  - Forward products (*month*) would require a more sophisticated prudential approach.
- Can pipeline capacity trading be supported by the market?
  - Exchange trading requires a high degree of standardisation. Such standardisation would be a challenge for pipeline capacity trading.
  - Value in development of standard trading terms, matching facility, settlement and capacity transfer services to support bilateral trading.

Proposal: Spot and short-term forward gas commodity products.

High Level Design
Trading Mechanism

- Exchange for wholesale trading of gas products:
  - Platform for lodging anonymous buy and sell orders.
  - Matching engine forms transactions.
  - Orders matched continuously during the opening hours of the market.
  - Allow off-market trades to be registered for settlement through the market.

	Bid		Offer	
	Qty (GJ)	Price ($/GJ)	Price ($/GJ)	Qty (GJ)
Gas Day 21 May	*2,000*	*5.50*	*5.50*	*4,000*
	3,800	4.80	5.70	1,500
	8,500	4.75	6.50	3,200

Transaction formed: 2,000GJ at $5.50/GJ.

- Noticeboard for matching buyers and sellers of unused pipeline capacity.

High Level Design
Gas Delivery Obligation

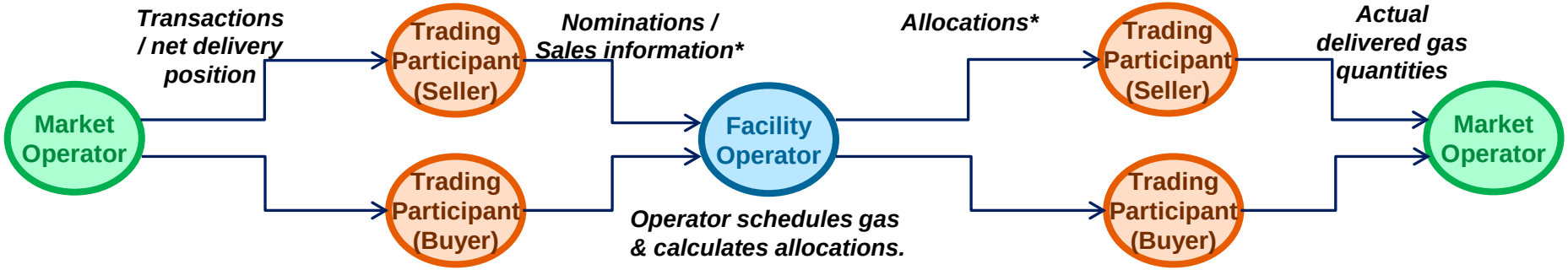
- Gas delivery obligation:
  - Transactions create a firm obligation to deliver gas.
  - Obligations could be linked to each ***individual contract*** or ***netted*** across transactions.
  - ***Netting*** reduces administration associated with the gas delivery process.
    - *Example:* 10TJ sale + 6TJ purchase -> Deliver 4TJ

Proposal: Firm gas delivery obligation linked to each individual transaction.

High Level Design
Gas Delivery Mechanism

- Process from transaction through to the scheduling of gas and the confirmation of gas deliveries.
- Delivery counterpart:
  - **Bilateral:** Buyer and seller are responsible for gas delivery in accordance with their contractual agreements with the facility operator, or
  - **Facility Operator:** The market operator exchanges transaction information with the facility operator allowing counterparts to remain anonymous.

Base model gas delivery process



* If the seller is a producer then they provide their sales allocations to the facility operator.

Proposal: Bilateral process as it does not require any changes to contracts.

Settlement and prudential model

- Centralised model provides:
  - Netting of settlement amounts across billing period,
  - reduces circular cash flow, and
  - avoids duplication of credit support.

Proposal: Centralised, net settlement with full collateralisation of settlement risks.

Settlement

- Settlement items:
  - ***Transactions:*** product of transaction price and quantity.
  - ***Imbalances:*** correct settlement for under or over delivery. Should also allow compensation for direct costs.
  - ***Market fees.***
- Billing could occur weekly or monthly as per WEM / STEM schedule.

Prudential

- Market operator regularly estimates and monitors exposure.
- Trading participants provide collateral to the market operator to cover their exposure.
  - For buyers, requirements would be 100% of the face value of transactions.
- Collateral must meet prudential standard.
  - The standard in the WEM is a guarantee provided by an entity that is supervised by APRA or a government treasury with A-1 credit rating or a cash deposit.

High Level Design
Market Information

- Market statistics
  - Transaction prices and quantities to be made available to the public to enhance the transparency of gas prices.
  - Order prices and quantities could also be made available.

- Trading participant information:
  - Confirmation of ***order submissions***
  - Confirmation of ***transactions***.
  - Details required for ***gas delivery*** including counterparty, gas delivery location and quantities.
  - Actual gas ***delivery quantities***.
  - Invoices and ***settlement*** supporting data.

High Level Design
Extended Model

- Extended features of the high level design are potential future market developments, they include:
  - *Hub Definition:* develop services to expand participation and trading liquidity.
  - *Forward Products:* development of medium to long term products, in conjunction with clearing house, to build supply portfolio and manage risk.
  - *Pipeline Capacity Products:* standardisation and regular trading could support exchange traded products.
  - *Netting of Gas Delivery Obligations.*
  - *Gas Delivery Mechanism:* direct exchange of transaction data between the facility operator and the market operator.
  - *Settlement and Prudential:* combine settlement of the proposed gas market and the electricity market.

Questions

High Level Design – Governance

Legal framework is required to:

- establish the market and empower the market operator
- provide standard terms for trading, delivery and settlement
- provide product specifications
- establish participation rights and obligations

It is expected that this would:

- take the form of a suite of regulatory instruments
- be implemented through amendments to the GSI instruments

High Level Design – Costs

Estimated Costs

- development and implementation of $1 - 1.5 million (recovered over 5 years)
- annual operational costs of $0.5 – 0.7 million (includes depreciation)
- participant costs (e.g. contract amendments) not easily quantifiable at this stage

Cost Recovery

It is expected that:

- all costs recovered from participants through a variable transaction fee
- any shortfall recovered through GSI fees
- if transaction fees exceed market costs, subsidise GSI fees

Participant and/or Government sponsorship could also be considered

High Level Design – Implementation

The IMO would be able to leverage the GSI Rules and GBB functions to facilitate the development of the regulatory and system changes required to establish a wholesale gas market.

The IMO would also investigate existing platforms (including those operated by the Australian Energy Market Operator and private sector parties) to ensure cost-effective implementation.

The IMO expects that implementation would take approximately 12-18 months (excluding Government decision making).

Introduction

Background

High Level Market Design

Next Steps

Next Steps

At the GAB meeting to be held this afternoon and beyond:

1. GAB to discuss the views expressed to date
2. GAB to decide whether to progress the proposal for consideration by Government
3. If supported, GAB Chair to submit proposal to Government on behalf of GAB

Questions?

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