



## **Evolution of Overseas Gas Markets, in an Australian Context**

**AEMC Gas Review Public Forum**

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**In our Evolution of the Gas Supply Hub work for AEMO, we looked at what other markets – in gas and other commodities – could tell us about an evolutionary path for gas markets in Australia.**

We noted a general evolutionary trend in network commodity markets:

Long-term take-or-pay supply contracts	→	Mix of longer and shorter-term instruments
Vertical integration	→	Unbundling of transportation from shipping/trading activities
Unequal/preferential access to transportation	→	Open and equal access to transportation
Little to no competition	→	Wholesale (and often retail) competition
No venues for price discovery	→	Trading through exchanges and other open venues

# Commodity Market Evolution in General

## Stability

- Regulation rules
- Long-term fixed price contracts
- Trading only for operations purposes

## Disruption

- Competition emerges
- Price shocks hit marketplace
- Long-term contracts are abrogated
- Participants must manage volatility

## Uncertainty

- Shorter-term transactions
- Commodity unbundled from other services
- Price transparency does not exist
- No forward price curve

## Efficiency

- Reliable indices provide pricing information
- Active and liquid derivative markets
- Development of a forward price curve
- Risk transfer venues become prevalent

## Integration

- Integration of all trading activities
- Risk aggregated at corporate level
- Capital allocation based on risk analysis

But, we note that:

“This evolution may occur organically, as it did with the first securities markets – with a bunch of like-minded merchants deciding to get together and trade in a coffee house, or around an old oak tree. However, progress can be hampered by individual interests in the short-term taking precedence over mutual benefit in the longer-term. In markets that utilise monopoly network infrastructure, it has often taken a regulatory and/or legislative push in the right direction.”

### ***Things that tend to need a push***

- Equal and open access to transport
- Structural separation of transport from competitive functions
- Effective capacity release mechanisms
- Participant sub-division of capacity rights

### ***Things that the market tends to sort out***

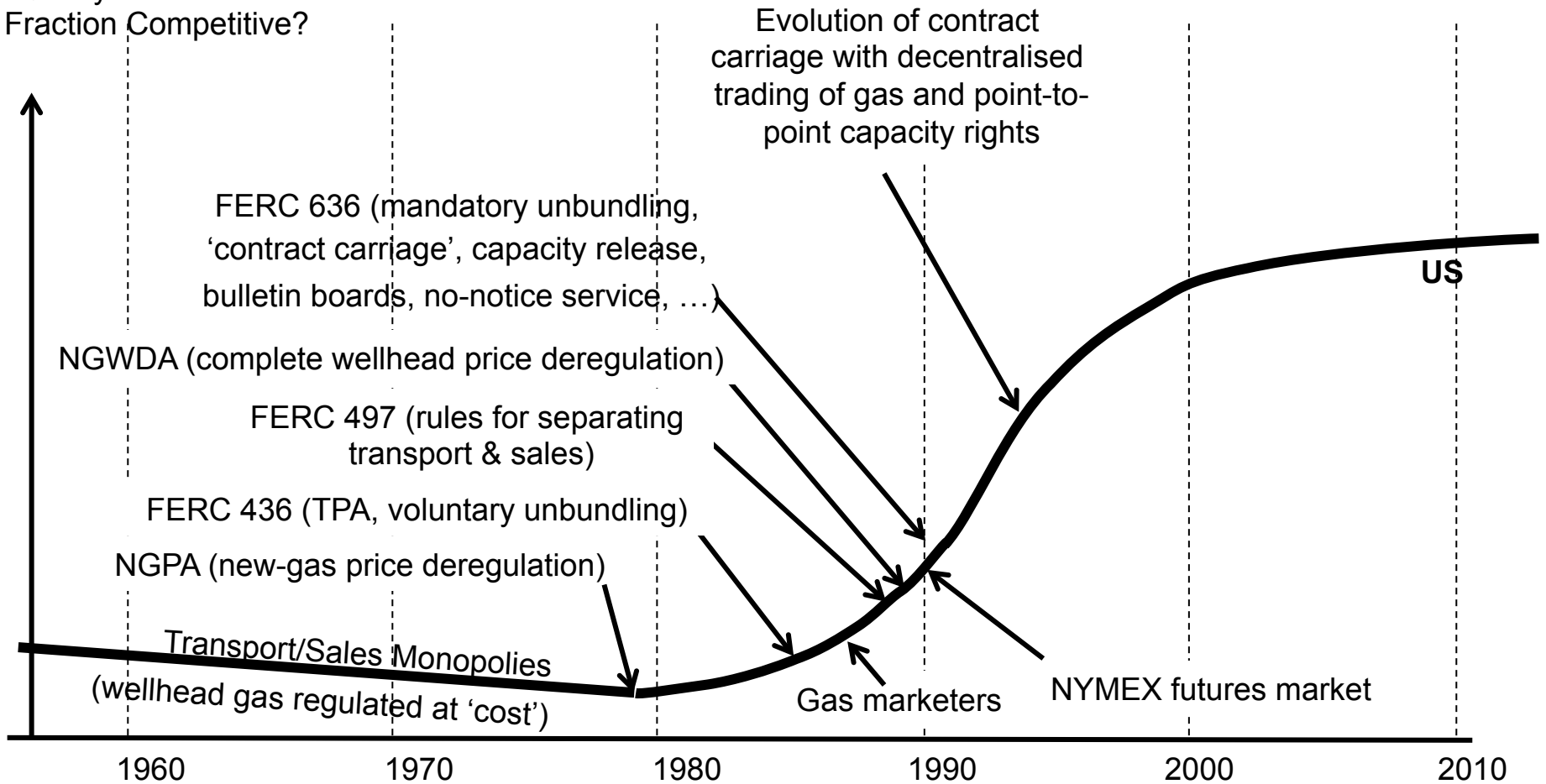
- Hub definition
- Development of forward markets, and growth of the range of locations and instruments traded

### ***Things that can go either way***

- Development of effective balancing/spot markets.

# Evolution of the US Gas Market

'Quality' of the Markets?  
Fraction Competitive?



Source: Larry Ruff, *US Gas Market Model*, Lectures for Master of Energy Systems, University of Melbourne, 2014

# Hub Development



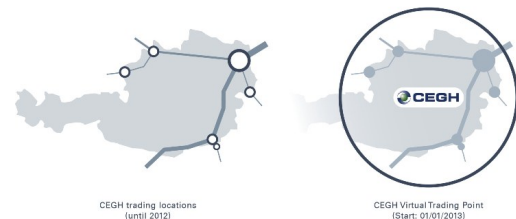
Source: Interfax, Natural Gas Daily

The hub is a locus for trading:

- It should be a point of substantial commercial activity, such as a major supply, demand or trans-shipment point

To succeed it requires:

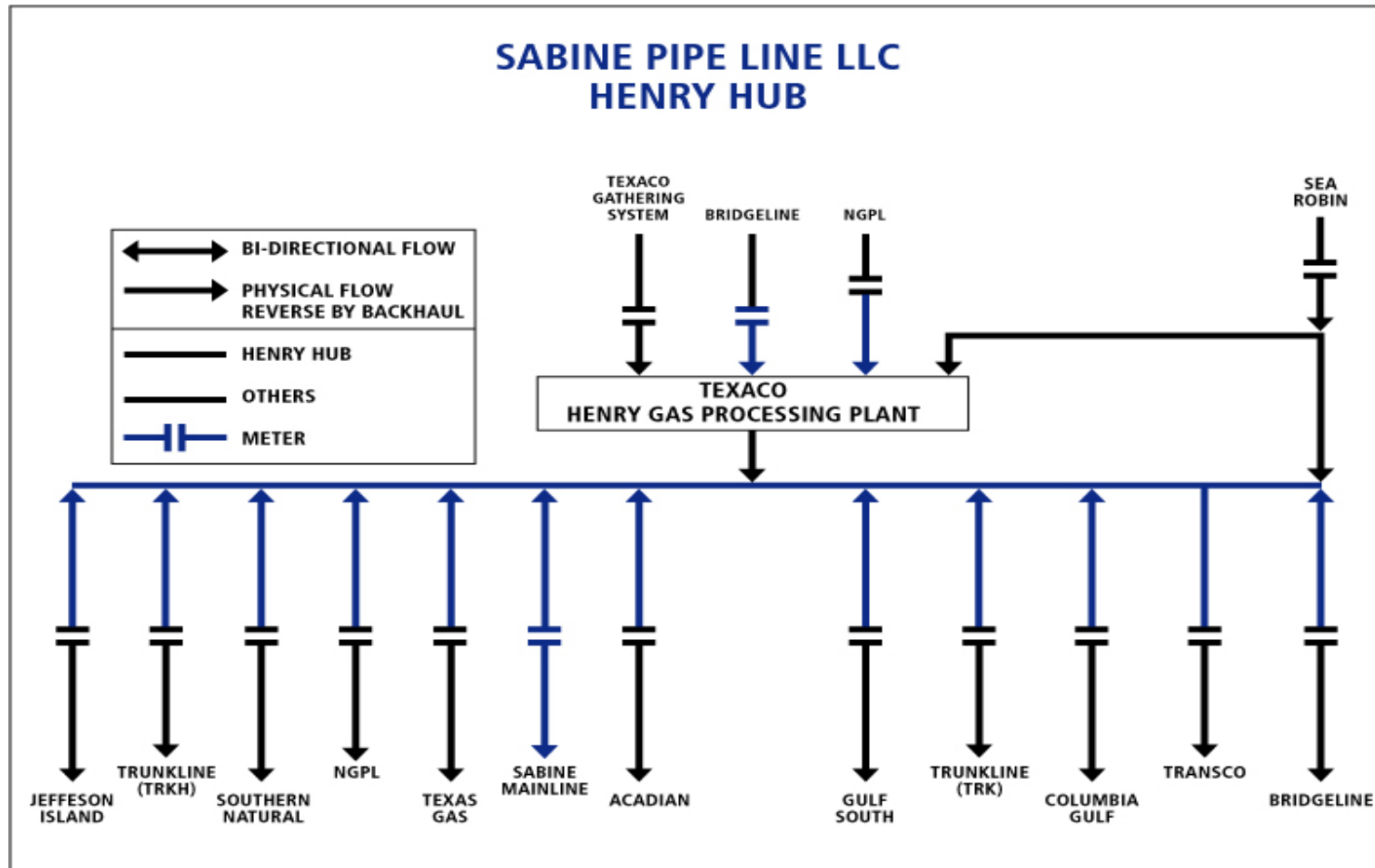
- A plurality of market participants present at, or shipping through, the location;
- Easy integration between the cash market and physical delivery;
- Little or no commercially material internal transportation/capacity constraint.
- 'Hub services' which aid the commercial convenience of hub users  
The Henry Hub, for example, provides facilities for gas balancing, compression, confirmation and renomination.



Wallumbilla seems as good a location as any in Australia, but doesn't satisfy the last two points.

- Why not toss APA a bone and pay it to augment? Short-term cost for longer-term market benefit.
- Could be part of a programme to get broader concessions re: open access, etc.

# Hub Development



Source: Chevron Texaco

# Transparency and Liquidity in Gas Trading



US has very active forward trading:

- Good liquidity for NYMEX Henry Hub benchmark and various basis contracts traded on ICE and CME/NYMEX
- Emergence of some shorter-term products
- Cash market not so transparent; reliant on price reporting, which has been subject to manipulation

Europe is a mixed bag:

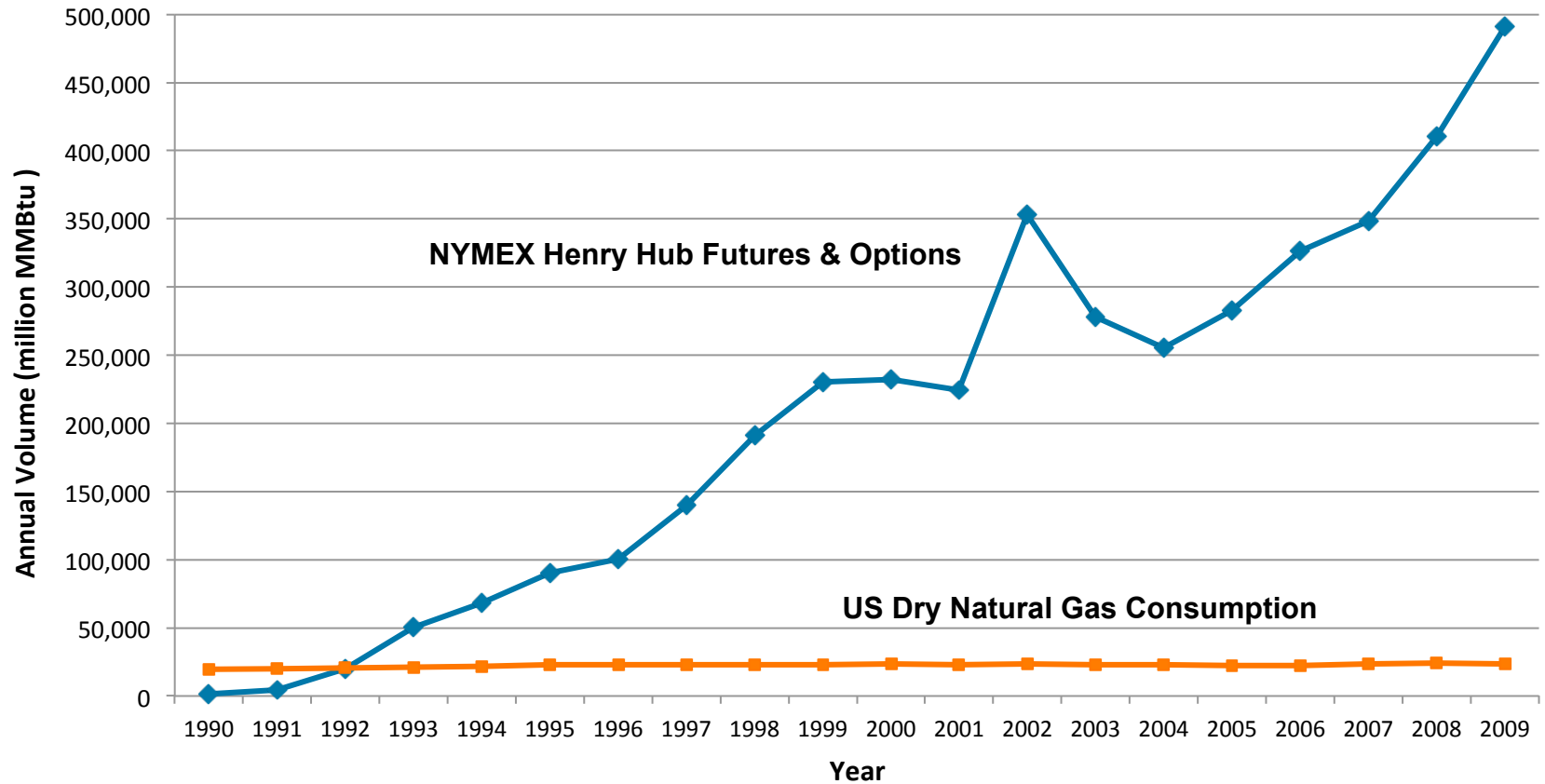
- Reasonable spot activity in UK, NL, BE, DE, AT, FR, DK
- UK NBP only product with strong forward market liquidity. NL TTF the best of the rest.

Development of the trading market in Australia, however, has been lacklustre.

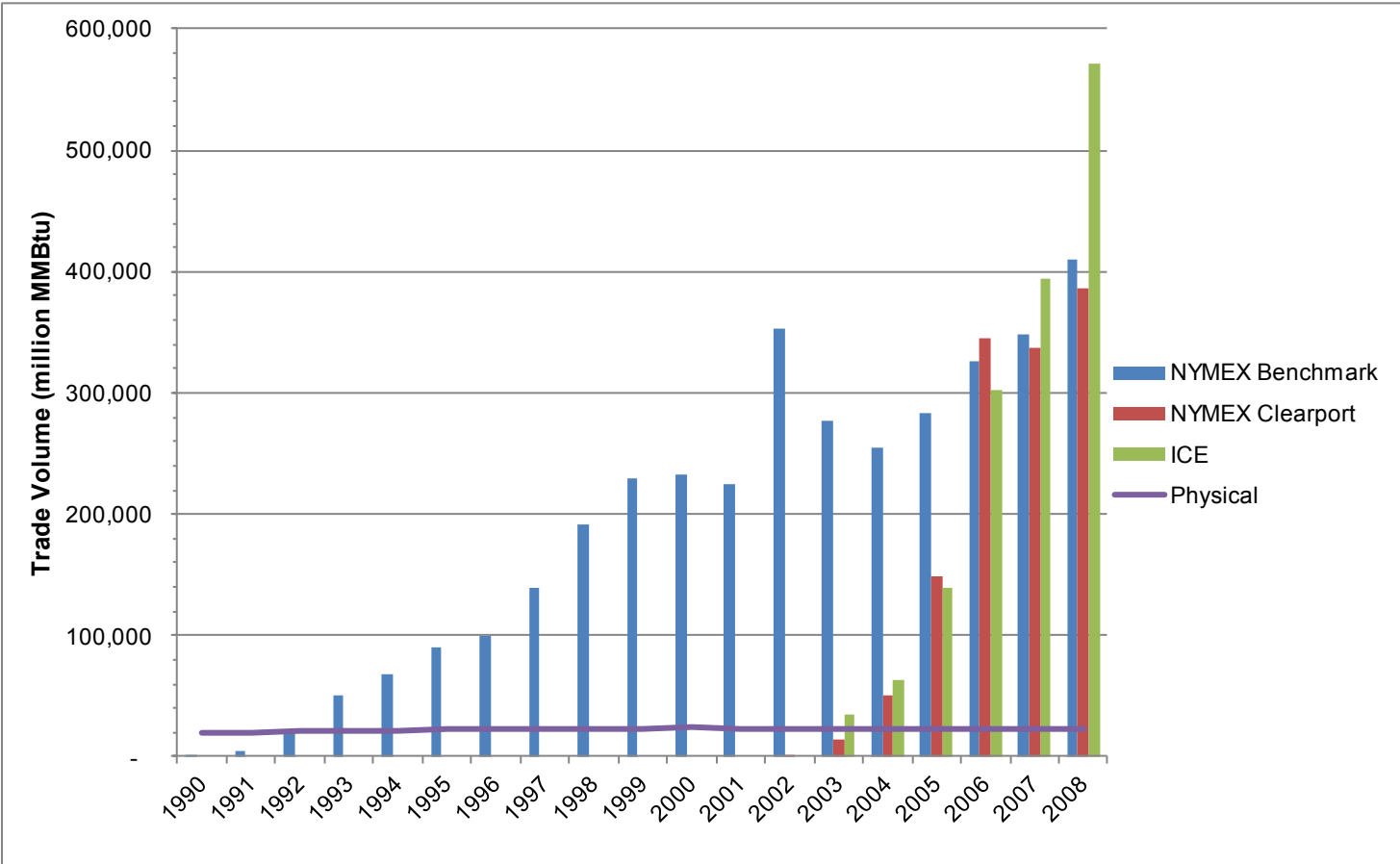
How then to encourage greater transparency and liquidity?



# Liquidity Development at Henry Hub



# Liquidity Development in Nth Amer Gas



Data Sources: NYMEX, ICE, US Energy Information Administration

# How to Encourage Transparency and Liquidity in Gas Trading in Australia



- ❖ Better transportation access, including:
  - Eliminate negotiated third-party access and incumbent preference
  - Better capacity release and capacity trading, including use of a transparent trading venue
  
- ❖ Augment the Wallumbilla hub to be a single virtual point
  - Does not mean elimination of all possible constraints, just reduction of the statistical likelihood of binding constraints on the most commercially attractive paths.
  
- ❖ Enhance hub services
  - Balancing, nomination and perhaps even storage
  
- ❖ Require greater forward market transparency
  - Should be wary of forcing all trade onto a forward platform (a la NZ electricity) as this can suppress nascent OTC trade
  - But can make the OTC market more transparent through reporting requirements (a la FERC), or OTC clearing (which also satisfies G20 requirements)

## Trends in Other Gas Markets



With ‘tight gas’, there are the haves and have-nots:

- Dramatic price reductions in US.
- Exports will moderate this, but there is extreme political pressure to ensure exports don’t force the price up too much.
- Other markets not seeing same reductions, though those with oil-linked LNG are seeing price drop-offs.
- Note: US exports likely to be priced against Henry Hub, not oil-linked; might drive a global LNG benchmark.

Altering pipeline flows in US:

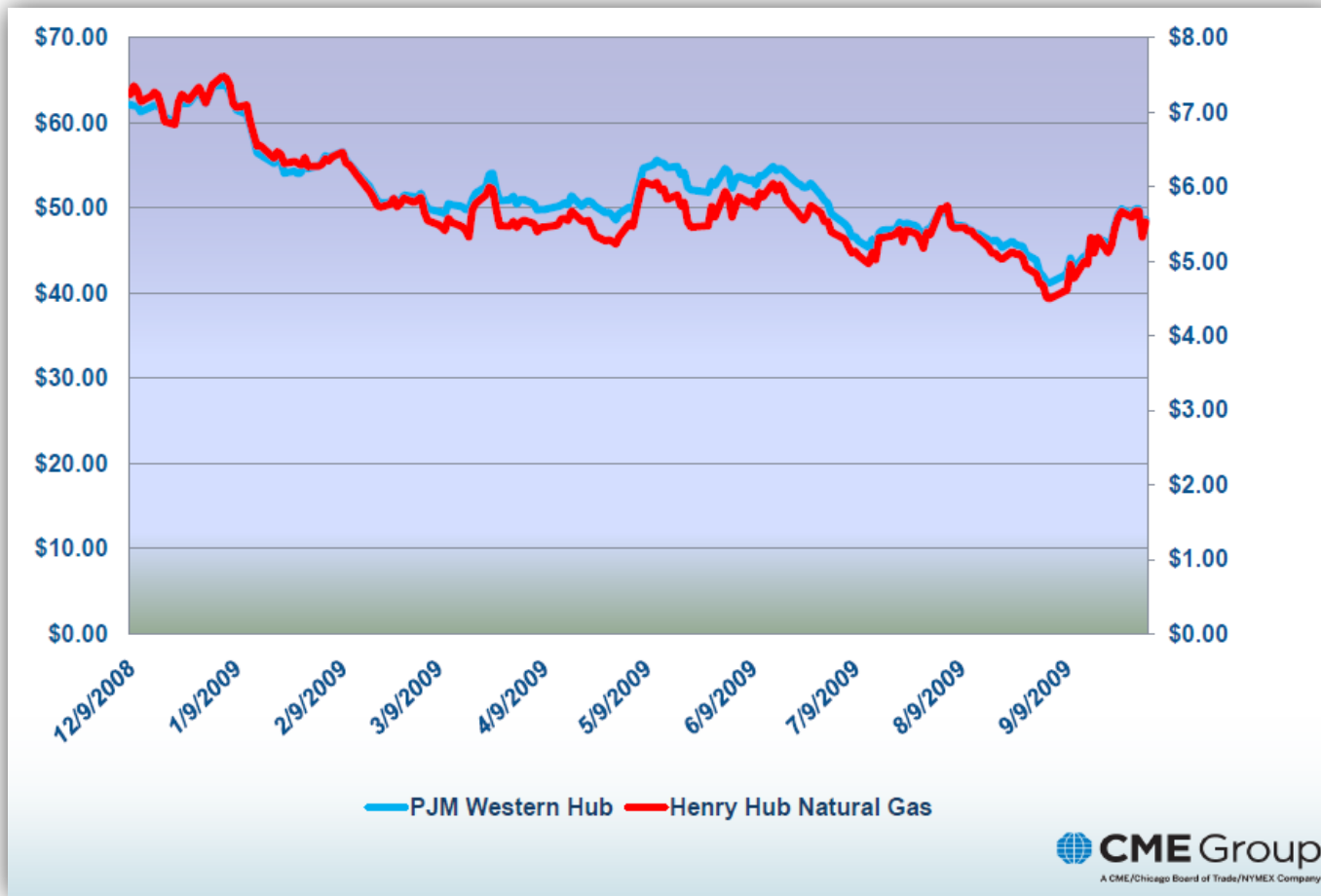
- Some Marcellus shale gas price points cheaper than Henry Hub.
- Increasing number of injection and withdrawal points.
- West-East pipelines being built; will they connect with North-South, creating a meshed network?

Gas becoming increasingly prevalent for generation:

- In part driven by price.
- Also by environmental factors – move away from coal, and a need to have more dynamic plant to deal with renewable intermittency.

# Gas as Marginal Fuel for Electricity Generation

Price Correlation: PJM Western Hub (\$/MWh) vs. Henry Hub (\$/MMBtu)



Source: Presentation by Brad Leach, CME Group, Association of Power Exchanges 2009 Conference, Boston, October 13, 2009

## Trends in Other Gas Markets



### Gas deliverability in US a serious concern

- Increased GFG has led to winter peak issues. ‘Polar vortex’ issues in 2013 in New England, NY, PJM.
- Historically, the strength of the US Model was its ability to stimulate new pipeline capacity.
- Participants believe model leads to over-build of expensive capacity. Pipeline not optimally used.
- Most GFG taking its chance on interruptible transport, even with the availability incentives provides by capacity markets in electricity; prefer to go dual-fuel instead.

### Is the long-haul ‘bundle of straws’ model breaking down?

- Some talk in New England about outside-the-market solutions (e.g. States paying for new build). This speculation is itself dulling pipeline investment.
- Thoughts also turning to a ‘gas ISO’ – topic has been actively engaged by some shippers, and a FERC Commissioner.
- Would this look like a system of entry and exit rights, as in some European systems, and perhaps something more radical?