KUALA LUMPUR 2012 WORLD GAS CONFERENCE

25th world gas conference

"Gas: Sustaining Future Global Growth"

IMPORT AND EXPORT OF LNG IN NORTH AMERICA: HISTORY AND FUTURE PERSPECTIVE

And now for something completely different…..

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US LNG Exports Are Nothing New!

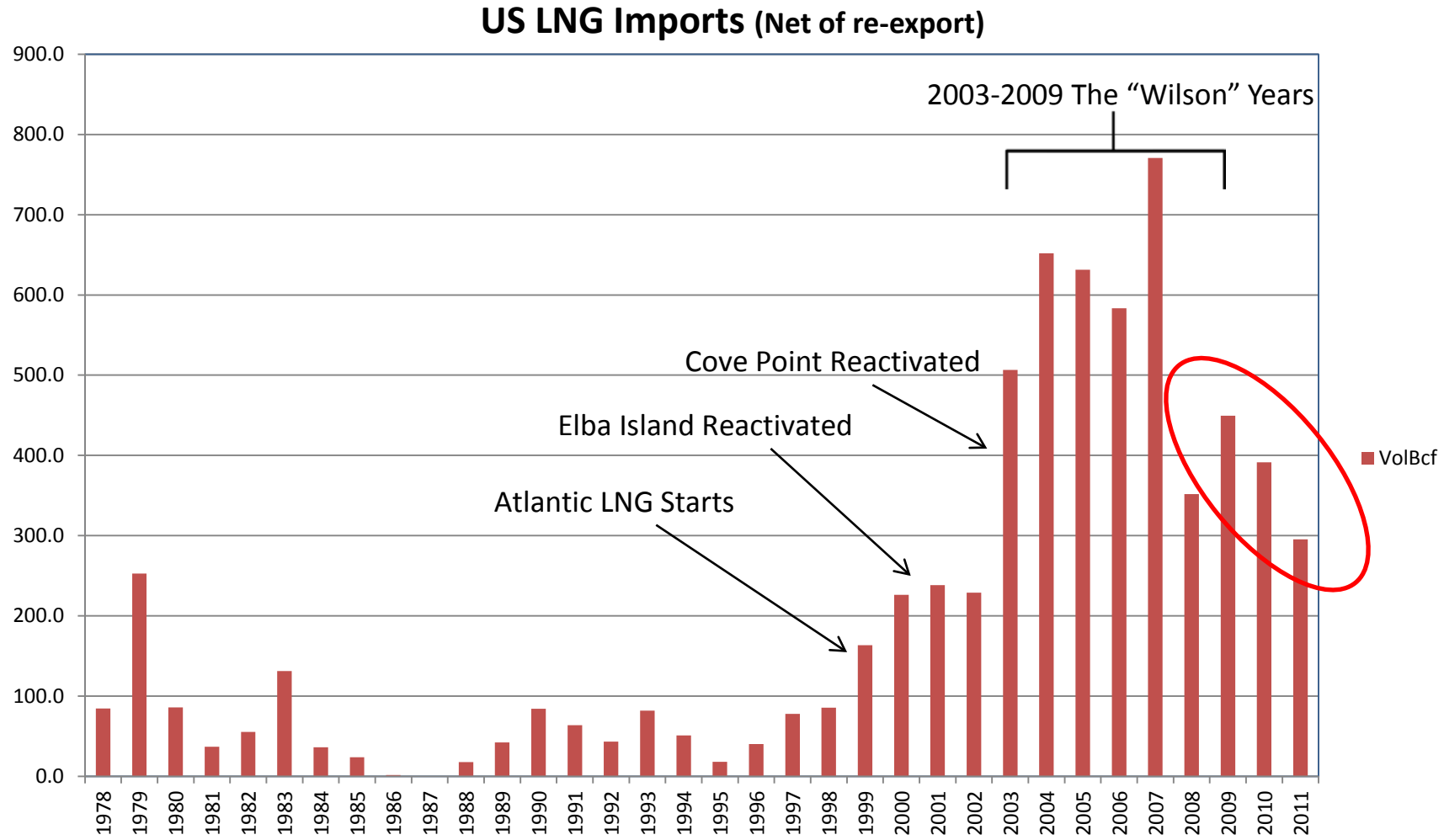
- Alaska LNG plant at Kenai commenced operations in 1969
  - Over 40 mt of LNG sold, almost entirely to Japan
  - Still in intermittent operation
  - The first plant to use Optimized Cascade liquefaction system: the technology to be used at Sabine Pass
- The first LNG export took place in January 1959
  - The Methane Pioneer sailed with 5000m3 of LNG from Lake Charles to Canvey Island in the UK

  - She was the first diesel powered LNGC
  - In 1968 she performed the first import to the US from Algeria

LNG Imports: a History Until 2000

- US domestic gas price regulation resulted in gas shortages during the 1970s
  - LNG imports, at higher prices, were considered essential to maintain gas supply
  - Cove Point, Elba Island and Lake Charles were built in this expectation
- Gas market deregulation provided pricing incentives to increase domestic gas supply
- Price disputes with Algeria resulted in the supply contracts being cancelled
  - Elba Island and Cove Point mothballed
  - Lake Charles operated intermittently, as did Everett
- Note that combining expensive LNG with price controlled domestic gas is not unusual
  - UK in the 1970s
  - India and Argentina currently use this approach

Post 2000: Import Renaissance or New Dawn Fades?



Post 2007: from Famine to Feast

- In the early 2000s new LNG import was foreseen by EIA and, importantly Cheniere, Sempra, Freeport and Repsol as conventional domestic gas supply was projected to fall
  - Directional drilling and 3-D seismic were not enough to bring new supplies forward
  - New terminals were constructed
- In 2007 the prophesy seemed to be fulfilled: all US terminals were running at capacity
  - 3bcf/d actually occurred in the summer!
  - Sadly, all the new terminals missed the party
- Then look who turns up…….

- US LNG imports through March 2012 are running at 178 Bcf annualized c.f. 295bcf in 2011
- Yet again, US is the market of last resort
- US gas reserve to production ratio climbs from about 10 years to over 20 years

US Export Projects: Can They *Really* Work?

Ingredients for a traditionally viable LNG project

- Negotiated and specially designed fiscal regime, backed by 20 year government commitment, to provide fiscal certainty
  - Oil based production sharing agreements do not usually address gas
  - Tax holiday e.g. 10 years (ALNG)
  - Accelerated depreciation

- These provide a means of risk sharing with host, BUT
  - No cookie cutter models, each one has to be negotiated
  - Negotiations take a long time, not under project control
  - Disputes over the terms can arise especially in changing market environment (Trinidad)

Ingredients (continued)

- Cheap gas
  - Usually gas that has no other value in the host market
  - Low cost to develop
  - Wet gas: condensates are a real bonus: low cost to process high sales value (Qatar)
  - Fixed price or price structured to ensure LNG plant is paid for (Indonesia)
- Good Geographic location
  - Close to multiple markets, preferably growing ones
  - No shipping bottlenecks such as canal transits
- Cheap Labor
  - Lots of it: plants need 3000+ construction workers
  - Lack of trades union disputes

Ingredients (continued)

- Oil major/strong technical sponsor
  - Shell has excelled in this role: Malaysia, Oman, Brunei, Sakhalin, QG4
  - Total, BP, BG also capable
  - NOCs can provide leadership: Petronas, Pertamina, ADNOC,
- Supportive Government or Country Environment
  - LNG is very much about international politics
  - Governments change: projects need to demonstrate good citizenship
- The Ability to Enhance Local Communities
  - Skills transfer/training
  - Social development

So How Do the US Projects Stack Up?

Not very well

Factor	Score	Comment
Fiscal regime	0/5	No special deals for LNG. Non-FTA export ruling hampers decision making
Cheap Gas	1/5	Gas price is determined by US market and is volatile. No condensates for project
Geographic Location	1/5	Far from major markets in Asia: Panama Canal will add to logistics costs: project economics will be hurt by high shipping costs
Cheap Labor	0/5	Plants will not be Thai-built modules but stick-built in the US
Strong technical sponsor	1/5	Specialized companies, based on import projects
Supportive Environment	0/5	US environmental lobby is well organized. Domestic industry opposed to export
Local community benefits	?	These are usually addressed at permitting stage, not always with success

And Now For Something Completely Different

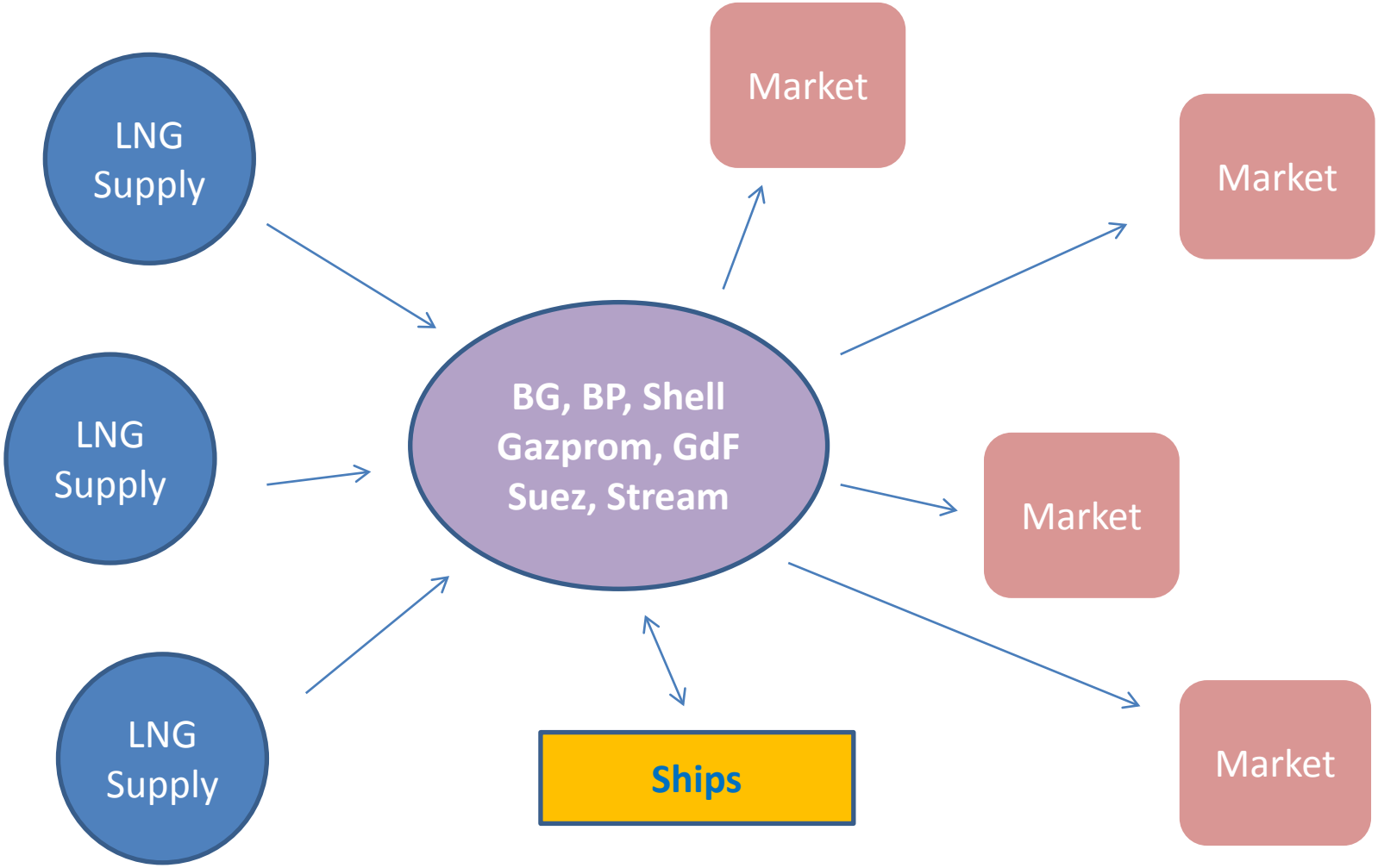
US LNG Export projects are based on a new business model and one that reflects the change in LNG as an energy source and especially how it is traded

Look at who the buyers are:

BG, GdF Suez, Gas Natural

Plus GAIL, Korea Gas, Mimi

Rise of the Portfolio Player



What is so Special About Portfolio Players?

Portfolio players:

1. Need LNG supply: traditional projects want to control where their LNG goes and are reluctant to sell to non-utility third parties
2. Make large margins ($4+ per MMBtu) by exploiting arbitrage between markets
3. Have high fixed costs in terms of shipping and terminal capacity
4. Have control of large fleets. BG 23 ships; Stream 21; GdF Suez 16 etc. This facilitates optimization and ability to respond to short term market dislocations
5. Are a critical part of the move towards commoditization of LNG

What Makes a Commodity?

- **Always available**
  - Look at 2011: Japan got all the LNG it needed
- **The marginal cargo price is set by supply and demand**
  - The marginal cargo follows the money
  - Spot price reporting is now commonplace
- **The means of transportation and storage are also commoditized**
  - Speculative new building of LNGCs
  - Re-export of LNG from the US: essentially storage plays
  - Singapore facility will add to this
- **Hedging instruments exist**
  - The new CME swap is an example, banks will also sell JCC and JKM hedges
  - Gas price hedges could be instrumental in securing profitability of US LNG exports

What Makes a Commodity?

- **Transaction effort and costs are minimal**
  - We are a long way from this: vessel compatibility, lots of different Master Sales and Purchase Agreements, no voyage charter party etc.
- **Marginal production is non discretionary**
  - E.g. oil wells run flat out, the corn crop 'is what it is'
  - In the traditional LNG world, production is performed to meet long term contracts. Spare capacity is held in reserve or used to recover from upsets
  - However projects with portfolio buyers such as Atlantic LNG have an incentive to run at maximum capacity. US Gulf export plants will run flat out.

US LNG Export projects represent more than just another tranche of LNG coming to the world market. They reflect a change in the way LNG commerce is performed and as such are an important milestone in the commercial evolution of LNG

Be Careful What You Wish For……..

- Commodities have global prices

- What Happens if there is a global price for LNG?
  - Arbitrage profits will be non-existent
  - Product will most likely be shipped to the nearest market reducing ton miles and the need for shipping

- Remember the US LNG experience: change happens faster then one might expect, even in LNG