The Long-Run Economics of Natural Gas

Joint Economic Committee

Testimony of

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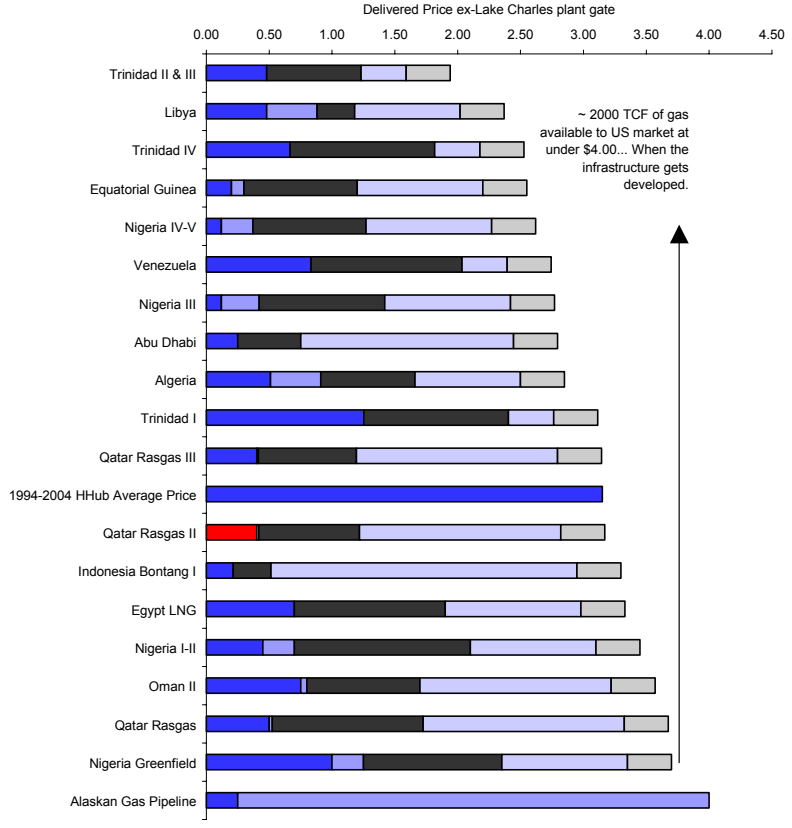
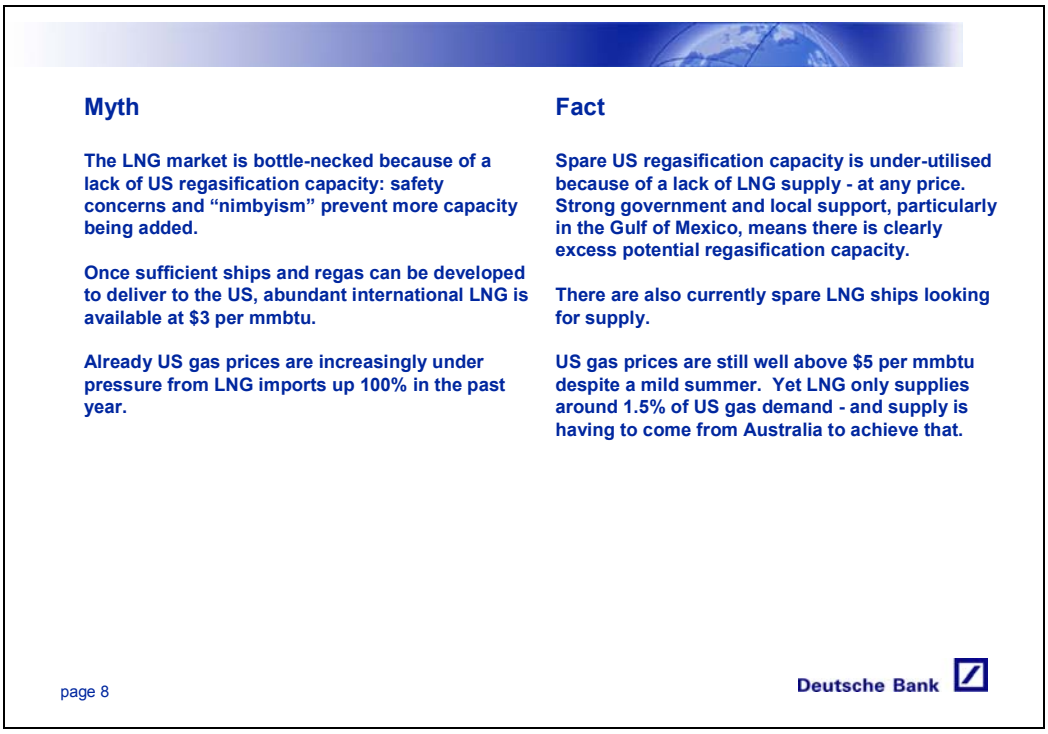
Despite huge gas prices across the globe, riding at $5+ per mmbtu ($40 per barrel), there is no major new project starting up this year to supply the global market with "liquid natural gas", or LNG. Literally trillions of feet of gas reserves are available at these prices. There is currently considerable spare LNG shipping capacity... but few new developments. LNG market growth of 20%-30% annually is hardly impressive from a base of 4 mmboe/d of LNG production or just 5% of the global oil market (80 mmboe/d). Growth this year of around 1 mmboe/d in the LNG market is under half the growth of the oil market in absolute energy terms. We question: LNG boom? What LNG boom?



We do not question the overpowering need for the US gas market to turn to imported supply, or that imported supply will be in large part in the form of LNG. Real US natural gas prices are rising inexorably against limited alternative fuel options – either domestic or imported. Abundant global gas is the overpoweringly logical solution to the increasing shortage of energy in the US. LNG is available delivered into the US market at around $3 per mmbtu – almost half the current prevailing US marker price for natural gas (Henry Hub 1 Oct 2004 quoted $5.40 per mbbtu). Price of Potential Gas Delivery to US market through LNG

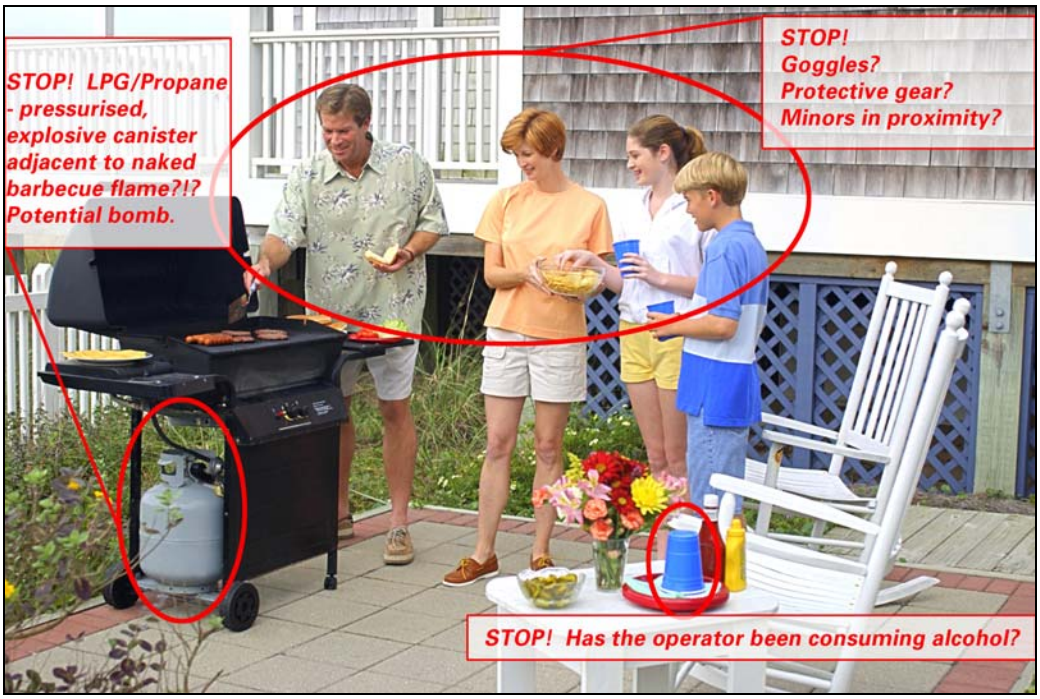
Oil industry leader in terms of long term planning and execution, ExxonMobil is leading the wider oil industry in the development of large scale imported natural gas into the US market through LNG – with first major deliveries scheduled for 2009. But nothing sooner – hence the myth of an abundant supply boom.

The idea of a US LNG boom that is in reality non-existent is one of several myths currently held. On the Deutsche Bank US oil team we highlighted the myths in our July research piece "Global LNG; Exploding the myths".



The most widely held misconception is that there is a problem with US regasification capacity - there is not. The four existing terminals have yet to sell out. LNG is safe and the public in the Gulf Coast of the US supports its development. Neither currently, nor longer term, do we see a significant issue with access to the US gas market. Rather, the terminals are extremely expensive, and to lower unit costs, have to be extremely large – filling them will be a greater challenge than building them. Terminals such as Sempra's Louisiana project have been approved for over a year, but have not progressed because no suppliers are available to provide LNG.

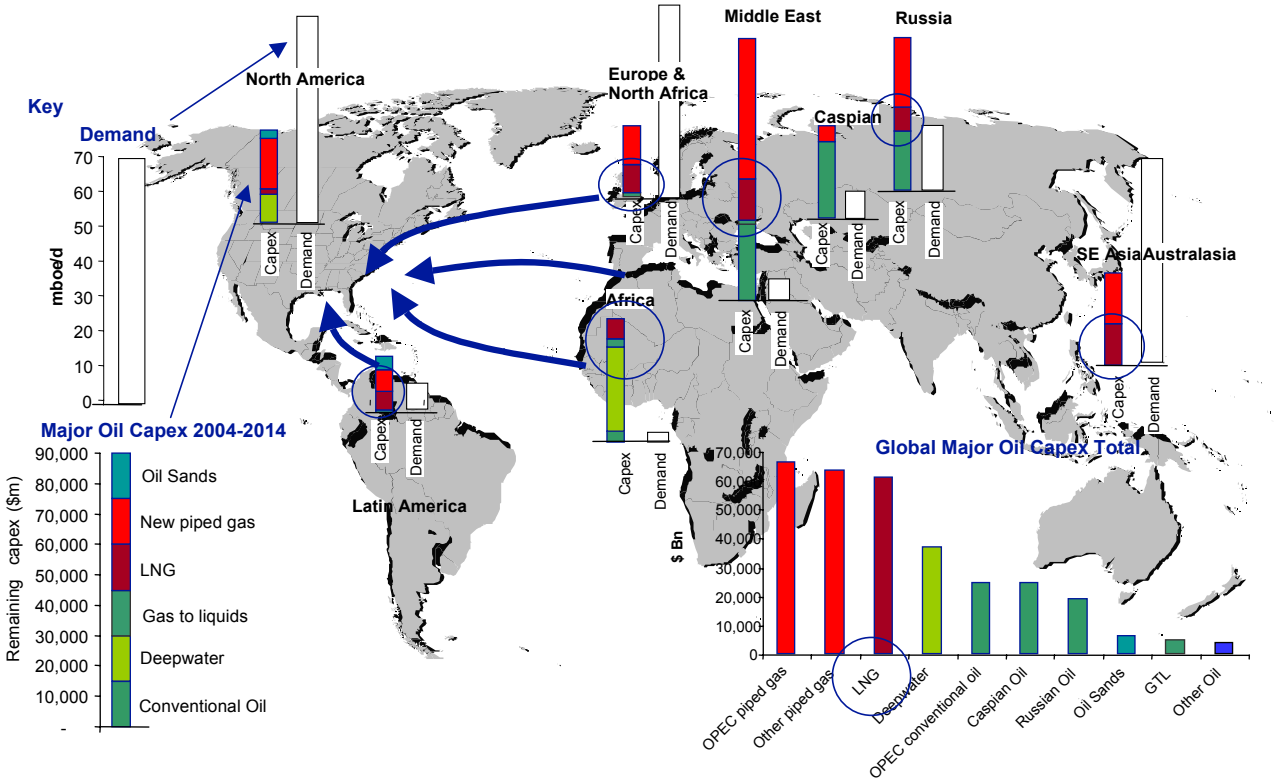
With tongue in cheek, we mocked the so called "NIMBY" issue, or "Not In My Back Yard" against the reality of almost every US back yard – a far more dangerous and fatal fact of American life: the propane gas canister feeding the barbeque. LNG, as frozen methane is far less explosive, with far higher safety standards, than millions of individually managed canisters in millions of American back yards.



In fact, the vast majority of LNG will be imported, like oil, through the Gulf Coast and as such does not face any issues of local opposition. Rather, in the short/medium term we see developing supply as the challenge. Lake Charles is currently taking delivery of LNG from Australia, and Malaysia – enormous distances for ships to travel past huge gas resources such as the Middle East, North Africa, West Africa and Trinidad/Venezuela. Going forward, several permitted regas terminals are slated at 1.5bcf/d of capacity (250kboe/d), which would require huge LNG projects to fill; the fastest LNG project expansions - e.g. Nigeria LNG - took six years from first delivery to reach that scale. To extend the example, prior to first delivery, the Nigerian project was 30 (thirty) years in development between gas discovery and first LNG. Venezuela will take longer. This is because there are multiple partners and developing governments to convince, multi-year planning and construction cycles... and potentially, based on planned start-ups, everybody will start attempting to build simultaneously. Qatar is slated for $30bn + of energy related investment over the next 10 years that will surely stretch capabilities.

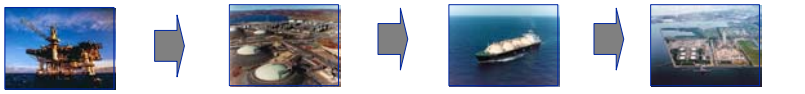
The LNG challenge fits our key overall oil and gas theme: the globe is underinvested in the infrastructure required to meet strong demand for oil and gas. OECD (ie North American and European) oil and gas is in secular decline. Replacement energy is distant and requires huge development expenditure. US gas and the LNG challenge is the most obvious, and largest, of these challenges.

Global Energy Investment 2004-2014, Major Oil Companies $Bn



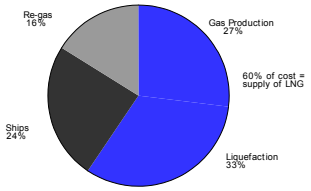
High US gas prices. With the capital expenditure and lead times required, the implication is high US gas prices - we do not see sufficient LNG to impact the overall US gas market before 2010, growing LNG volumes will at best replace the declines in US gas production. Currently the FERC is strongly encouraging the development of regasficiation terminals, but we see the regasification element of the chain as the tail on the dog. The real challenge, as evidenced by the relative expense, is in developing international gas which at this time is currently under jungle and beneath sea in distant, political complex and risky countries.

The LNG business is basic but extremely expensive - 5 Mt "single train" plant



Upstream	Liquefaction	Shipping	Re-gas
5 Mt * $200 per tonne capacity =	5 Mt * $250 per tonne capacity =	5 ships * $180 m per ship =	US$50m per 100 mmcfd of capacity =
US$1000 Bn	US$1250 Bn	US$900mn	$600 m

A generic "greenfield", integrated 5 Mt LNG project has a capital cost of ~US$3.75bn



$5 bn = ~ 0.5 bcf/d of gas delivery.

US market ~60 bcf/d