



OXFORD INSTITUTE FOR ENERGY STUDIES Natural Gas Research Programme







Future Gas Supply & Pricing: The Importance of Asian Demand and North American Supply

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OXFORD INSTITUTE FOR ENERGY STUDIES Natural Gas Research Programme

Themes

- **Current Market Situation**
- **Major Future Global Gas Uncertainties**
- **Scenario Modelling Outcomes**


Based on the Following Research:

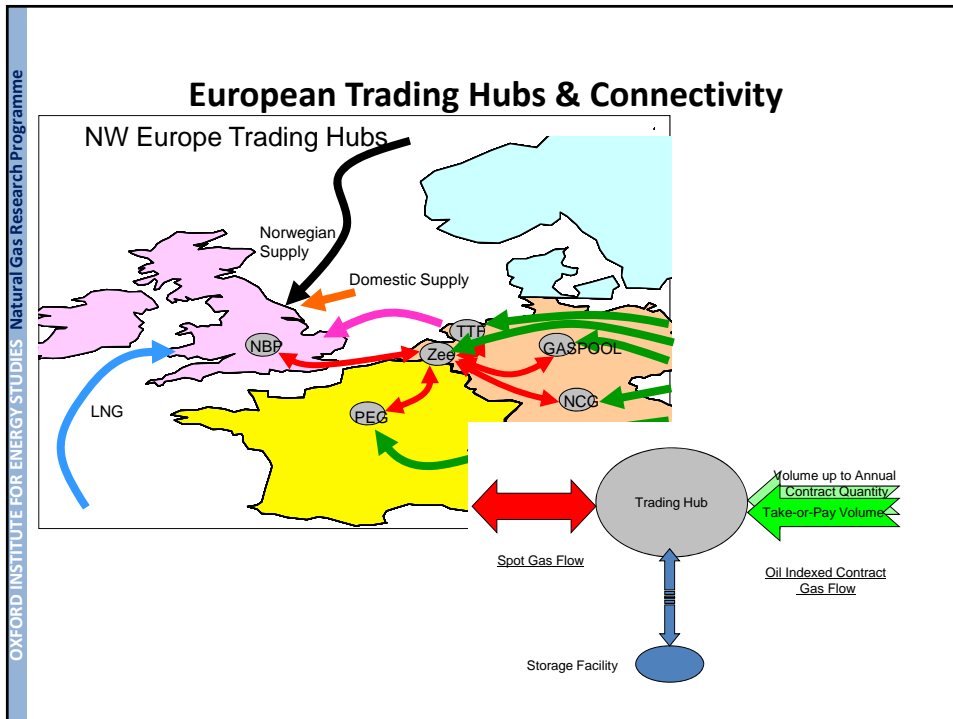
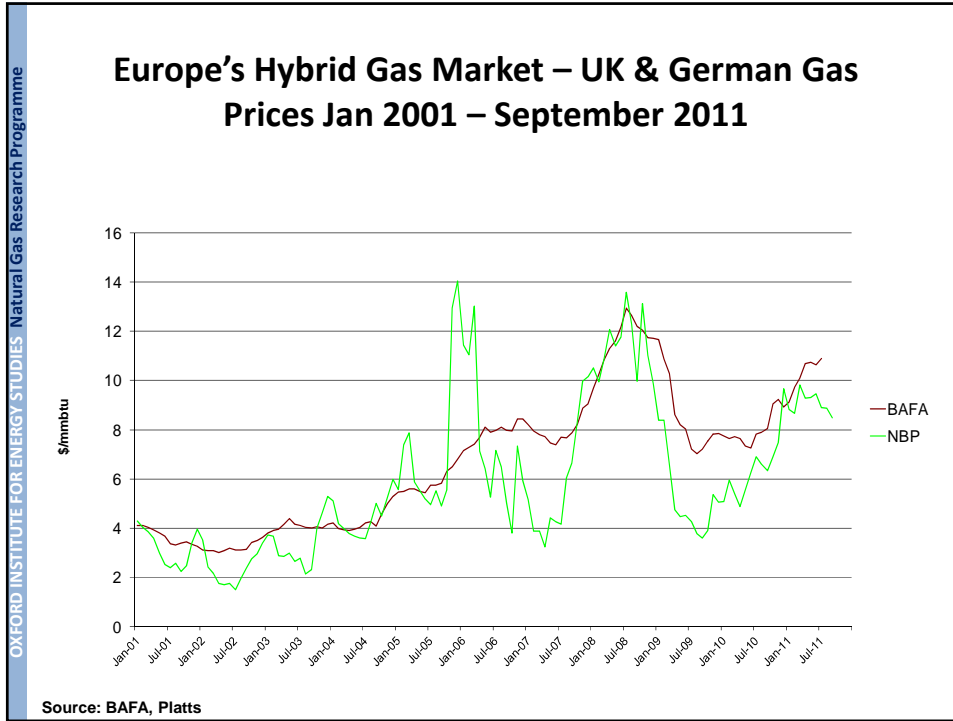
'LNG trade-flows in the Atlantic Basin, trends and discontinuities', Howard Rogers, March 2010, <http://www.oxfordenergy.org/pdfs/NG41.pdf>

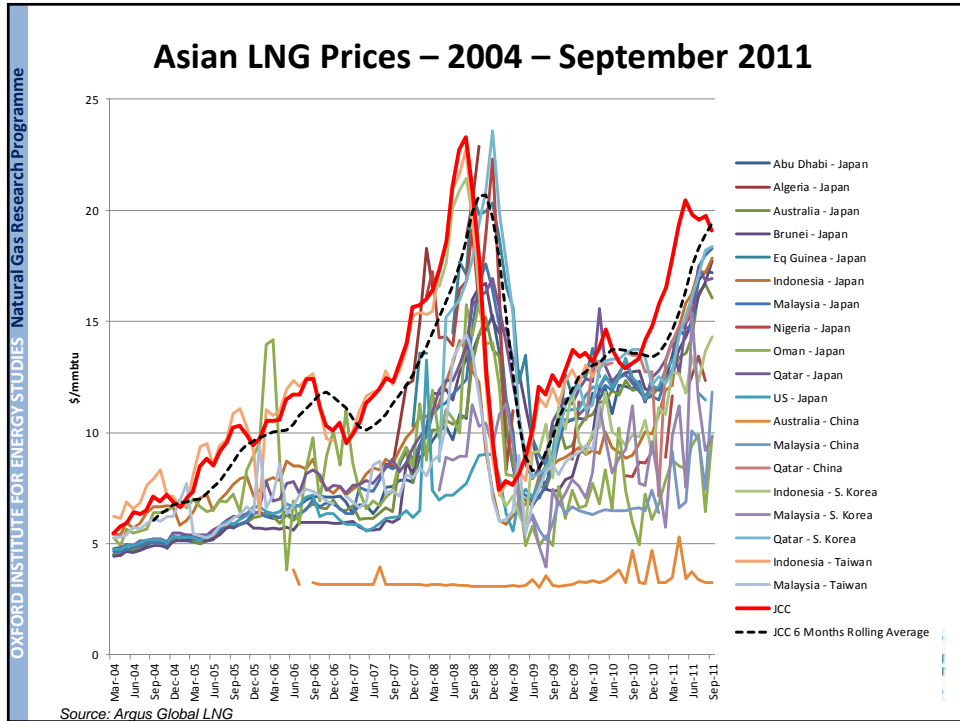
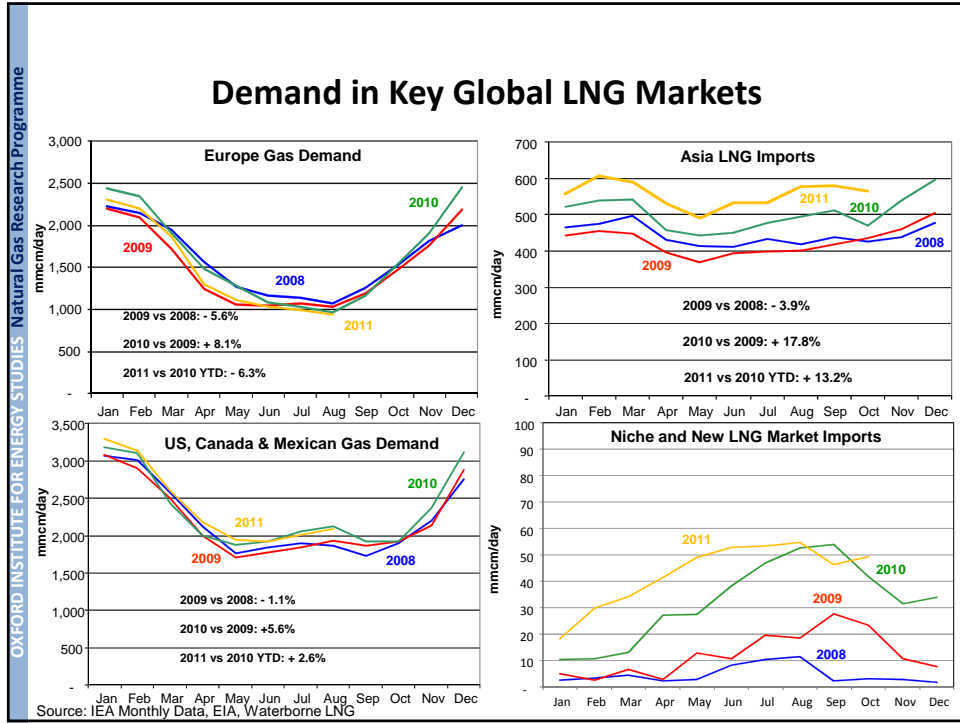
'Can unconventional Gas Be a Game Changer in European Gas Markets?', Florence Geny, December 2010, <http://www.oxfordenergy.org/wp-content/uploads/2011/01/NG46-CanUnconventionalGasbeaGameChangerinEuropeanGasMarkets-FlorenceGeny-2010.pdf>

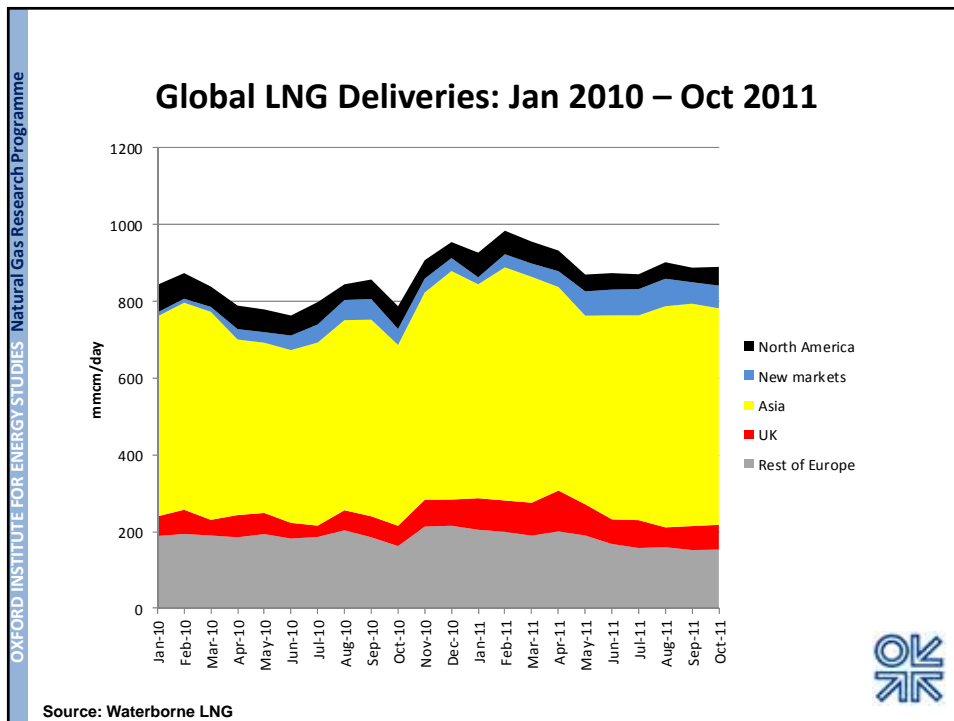
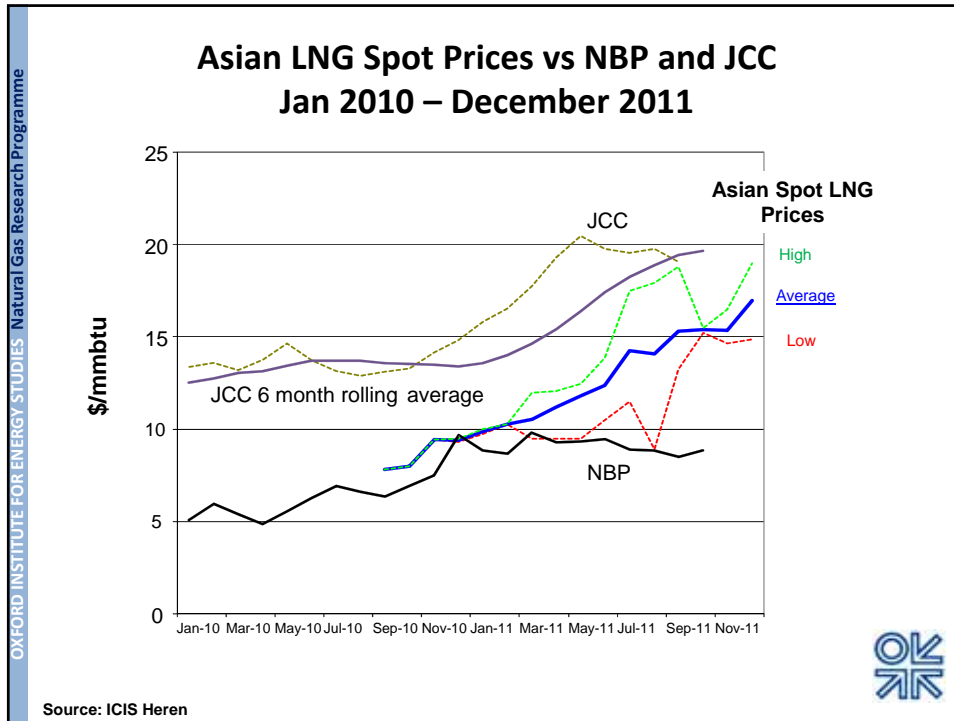
Shale Gas – the Unfolding Story' – Article in Oxford Review of Energy Policy, Volume 27, Issue 1, Pp. 117-143
<http://oxrep.oxfordjournals.org/content/27/1/117.short?rss=1>

'The Interaction of LNG and Pipeline Gas Pricing: Does Greater Connectivity Equal Globalisation?' (Forthcoming 2011)







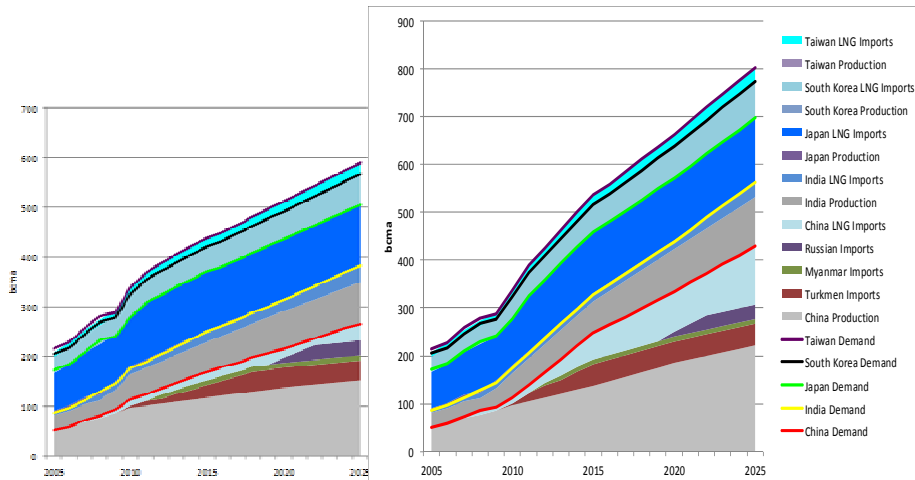


The Future: Major Uncertainties

- Asian Natural Gas and LNG Demand.
- US Future Shale Gas Production Growth and potential scale of North American LNG exports.
- Timing/slippage of new non-North American LNG projects.
- Production versus pricing policy for European pipeline gas suppliers post oil-indexation.



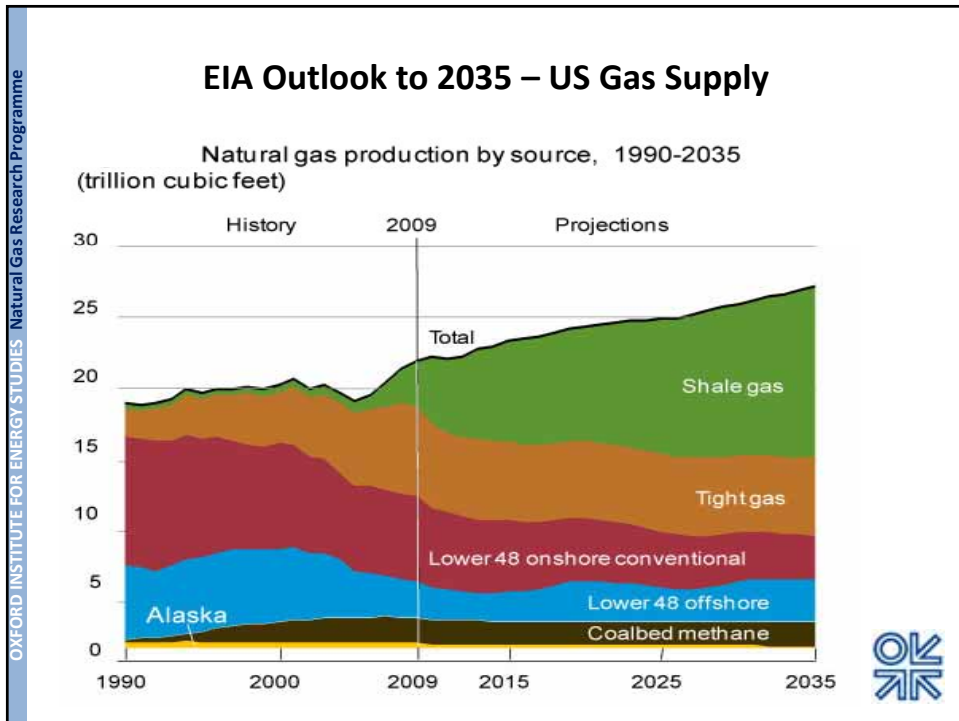
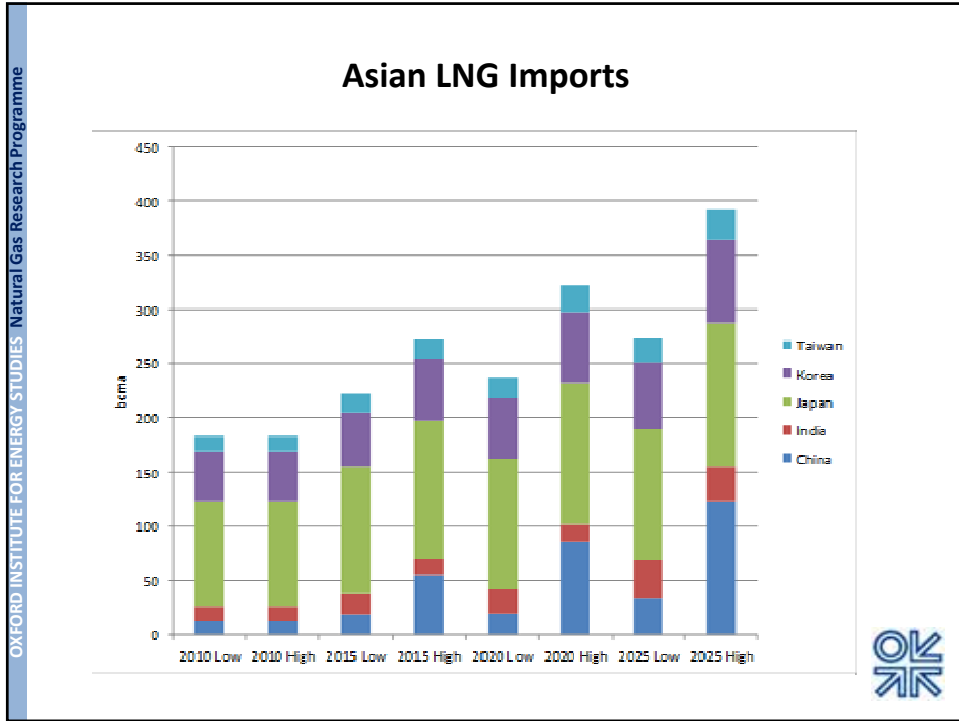
Asian Demand Growth

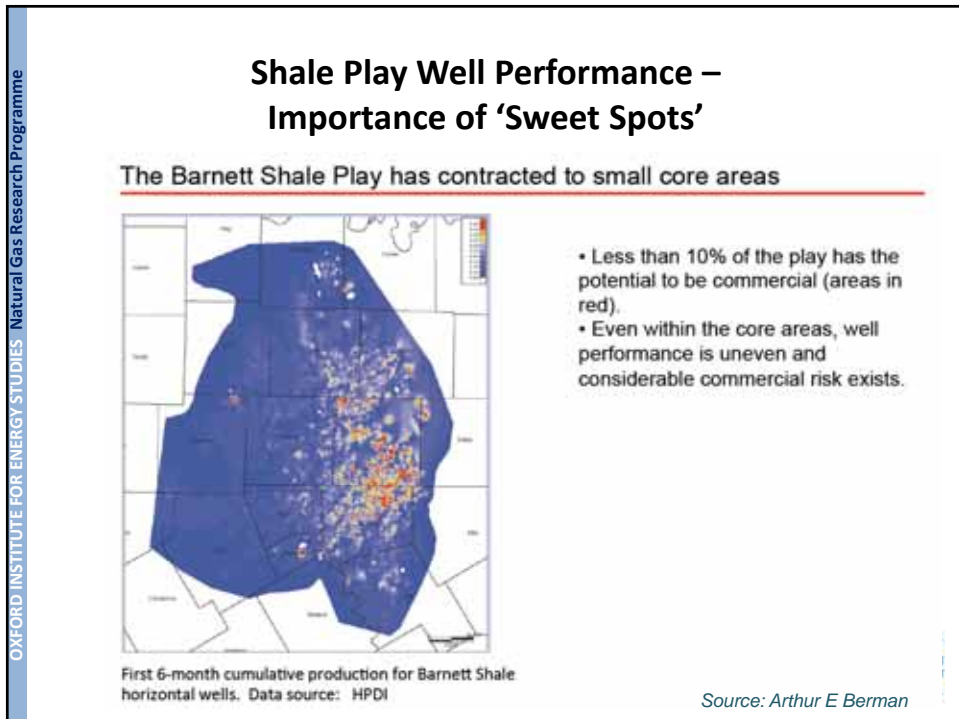
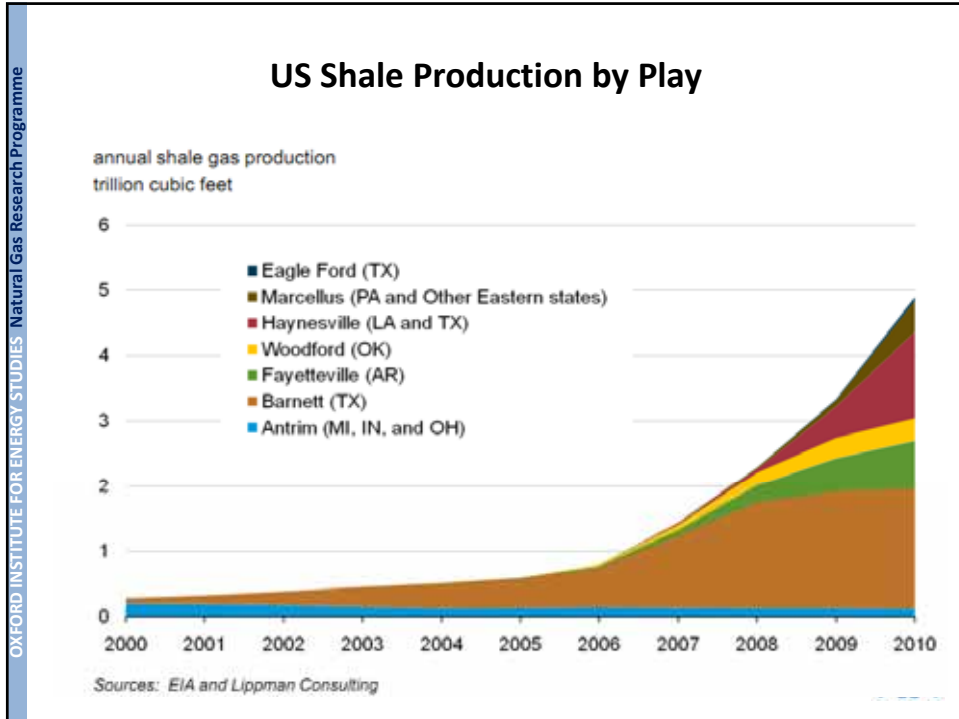


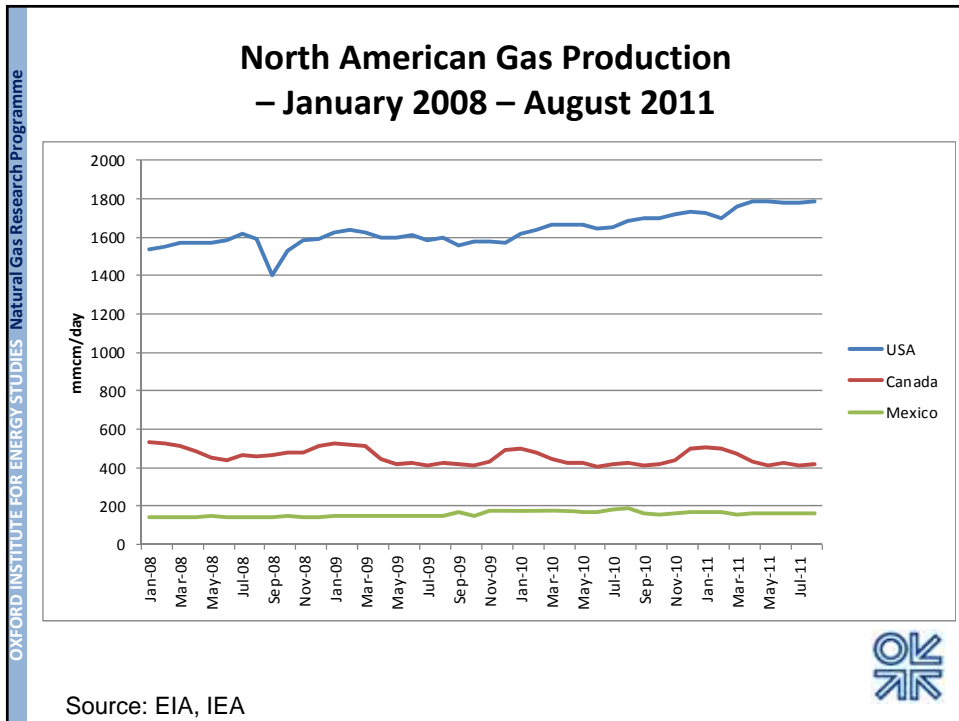
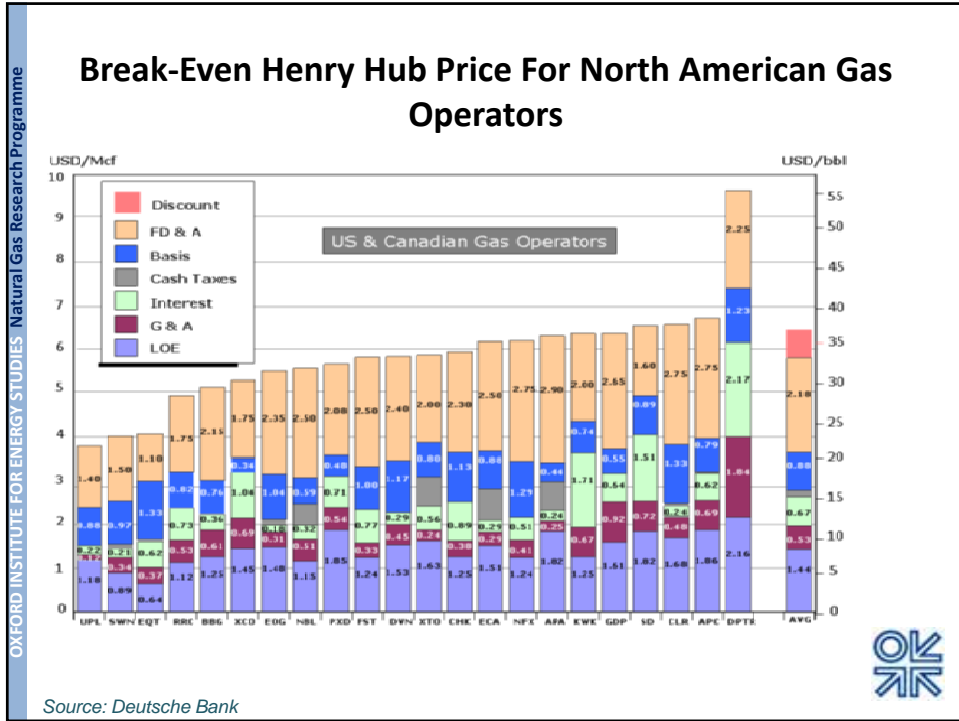
Low Demand Growth
(IEA WEO 2010 New Policies Scenario Demand)

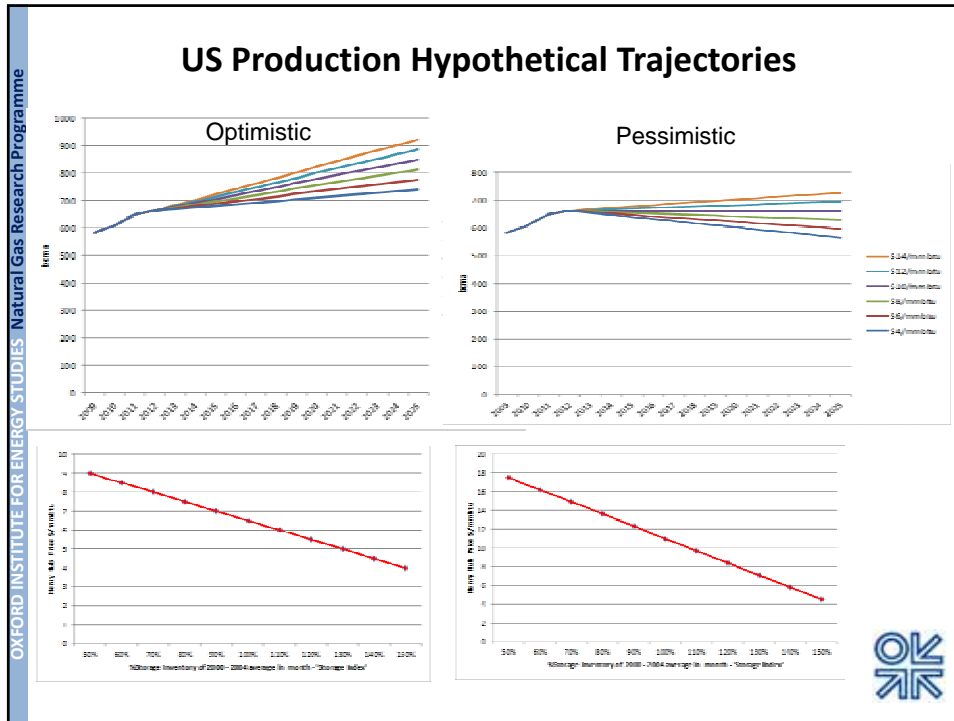
High Demand Growth
(IEA Golden Age of Gas Scenario Demand)









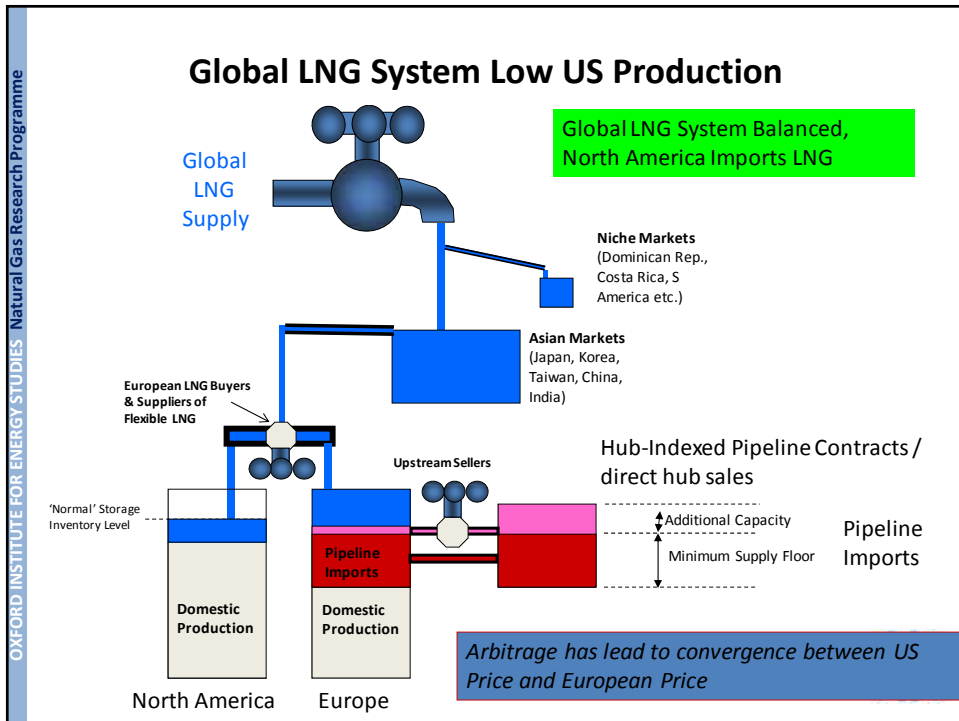
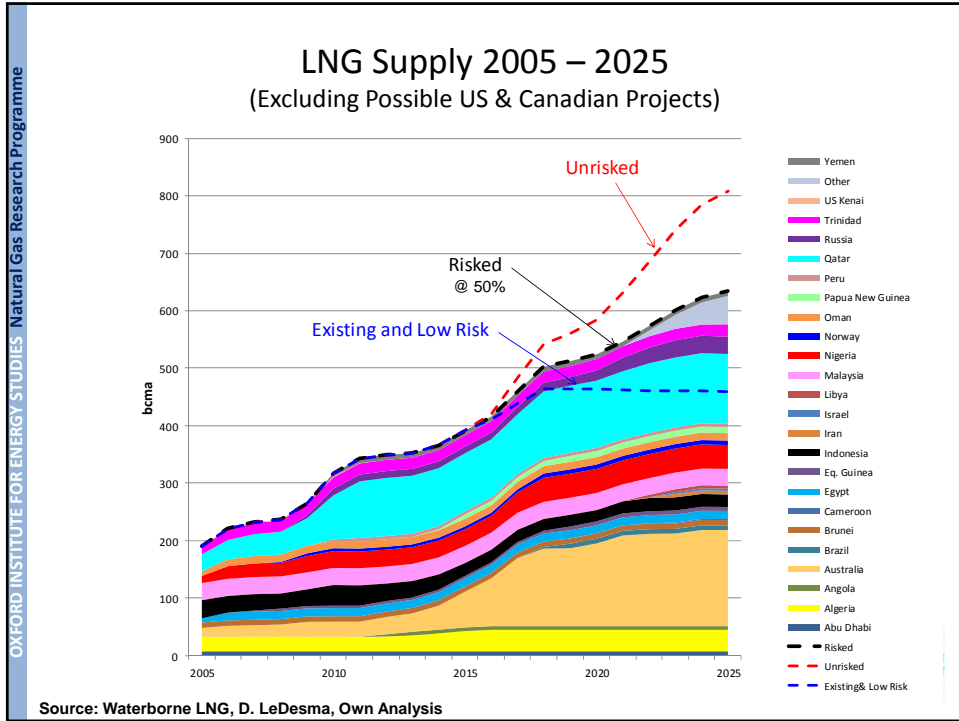


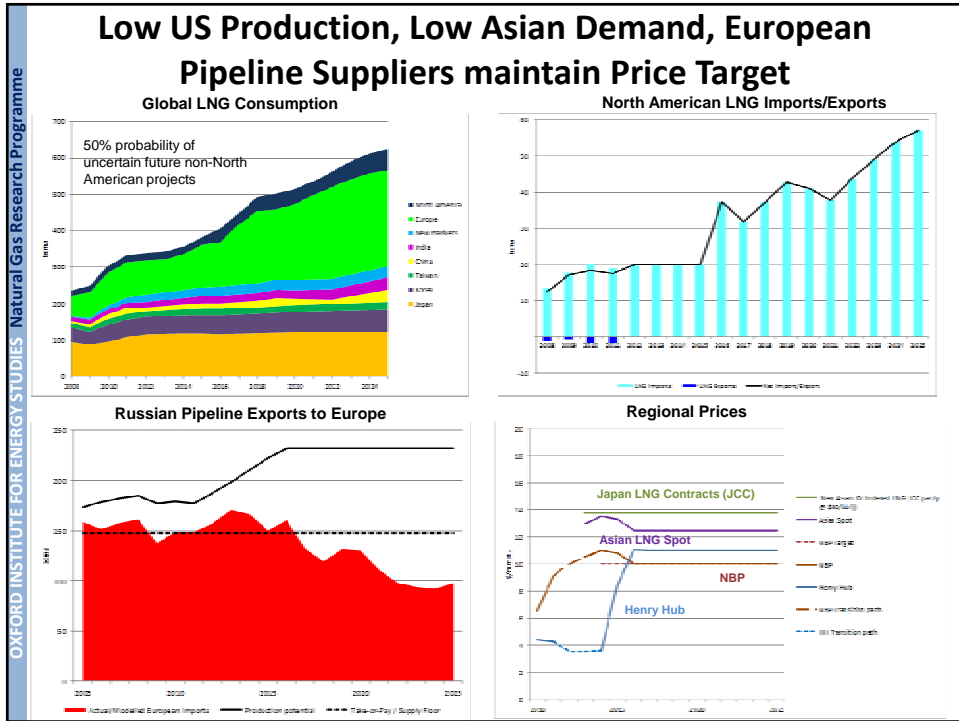
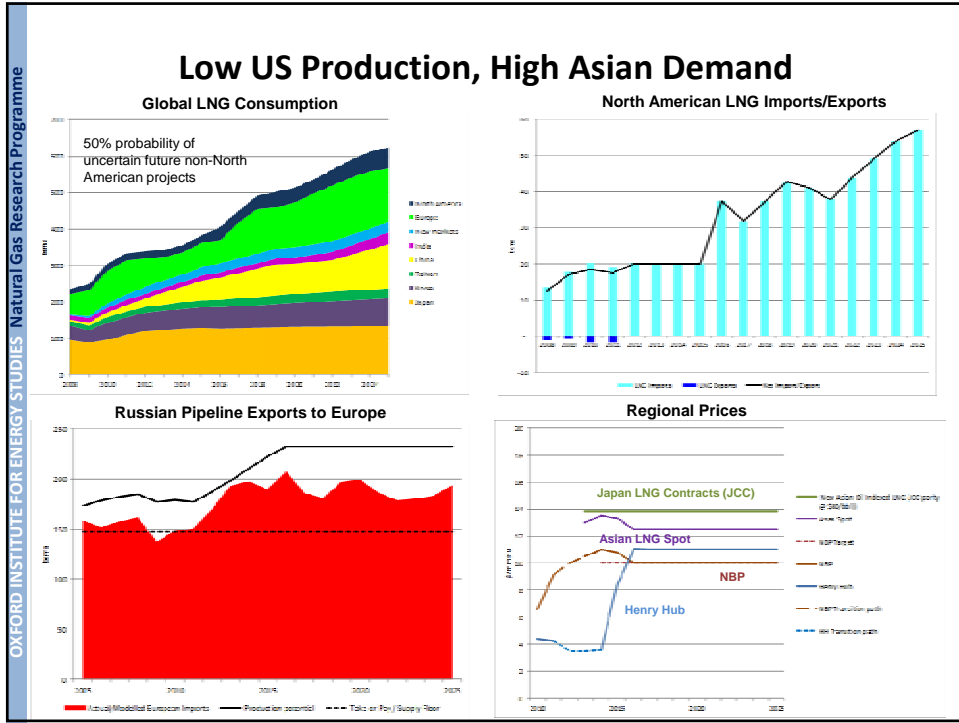
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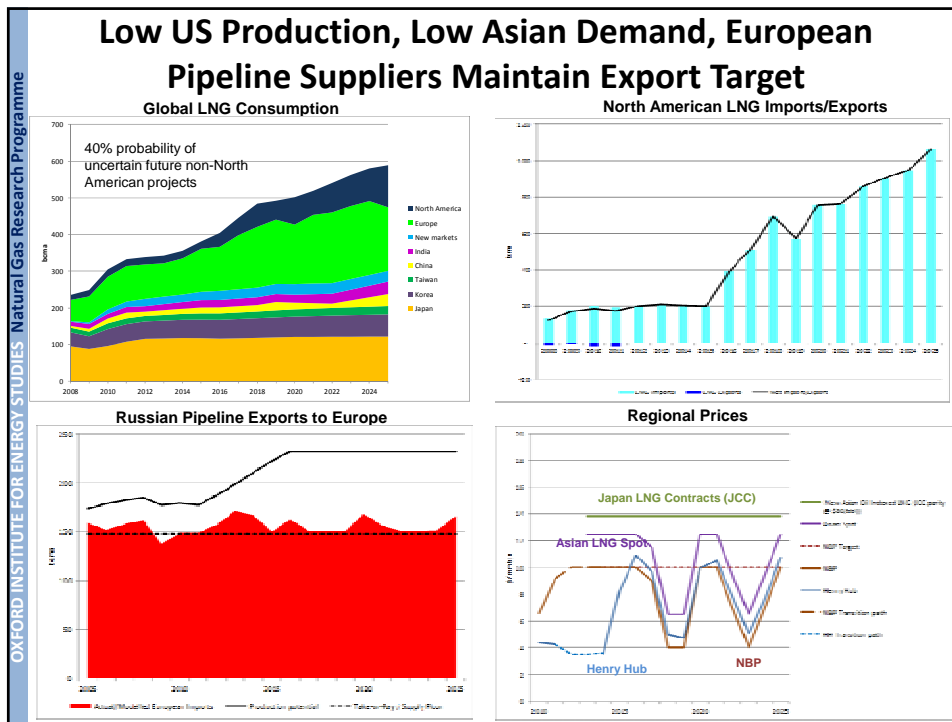
Potential North American LNG Export Projects

Terminal/Project - US	Commercial partners	Capacity (bcma)	DoE Status	FERC Status	Possible Start-up
Sabine Pass	Cheniere	22	Approved	Under Review	2015
Freeport	Freeport LNG, Macquarie	12.5	Approval Expected 2011	Under Review	2016
Lake Charles	Southern Union, BG	19.3	Approved	Not Yet Applied	2016+
Cameron	Sempra	24	Not Yet Applied	Not Yet Applied	2016+
Cove Point	Dominion	11	Not Yet Applied	Not Yet Applied	2016+
Jordan Cove	Jordan Cove Energy, First Chicago	12	Not Yet Applied	Not Yet Applied	2016+
Sub-total		100.8			
Terminal/Project - Canada	Commercial partners	Capacity (bcma)	Environmental Approval	Other Approvals	Possible Start-up
Kitimat	Apache, EOG Resources	6.9	Approved	Underway	2015
BC LNG	LNG Partners, Haisla First Nation	2.5	Not Yet Applied	Not Yet Applied	2016+
Prince Rupert	Shell	13.8	Not Yet Applied	Not Yet Applied	2016+
Petronas	Petronas	10.2	Not Yet Applied	Not Yet Applied	2016+
Sub-total		33.4			
Total US & Canada		134.2			

Source: Waterborne LNG, A. Flower OIES



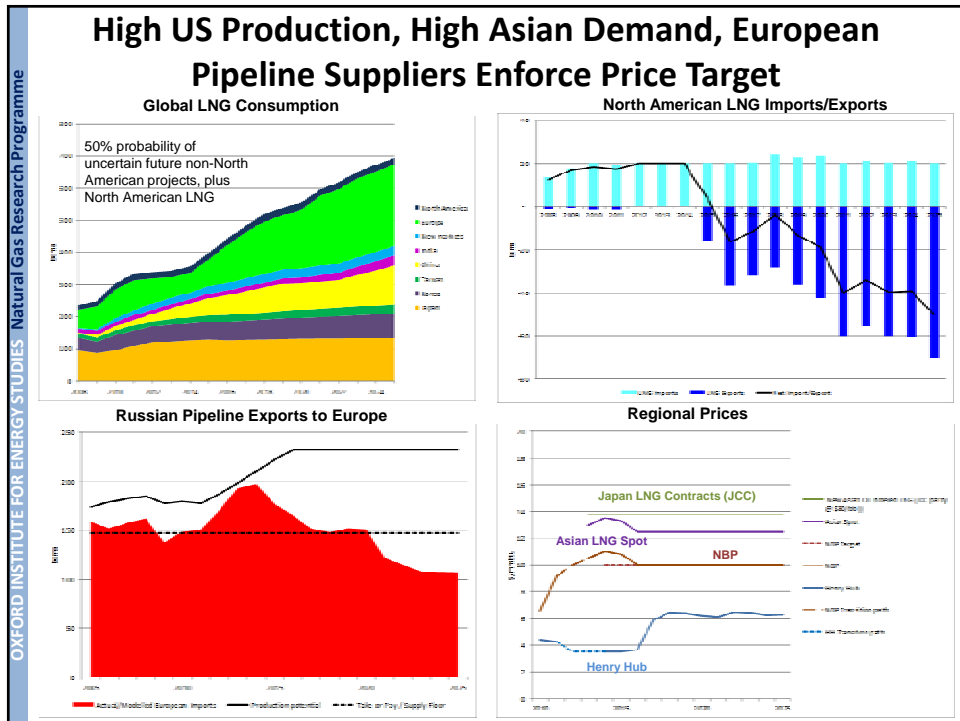
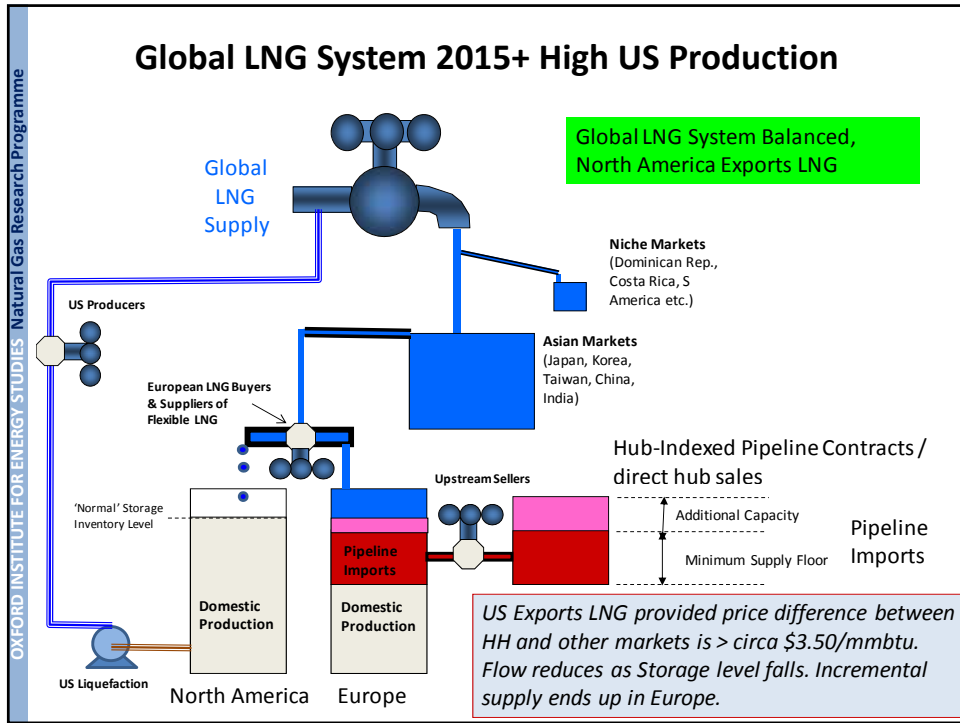


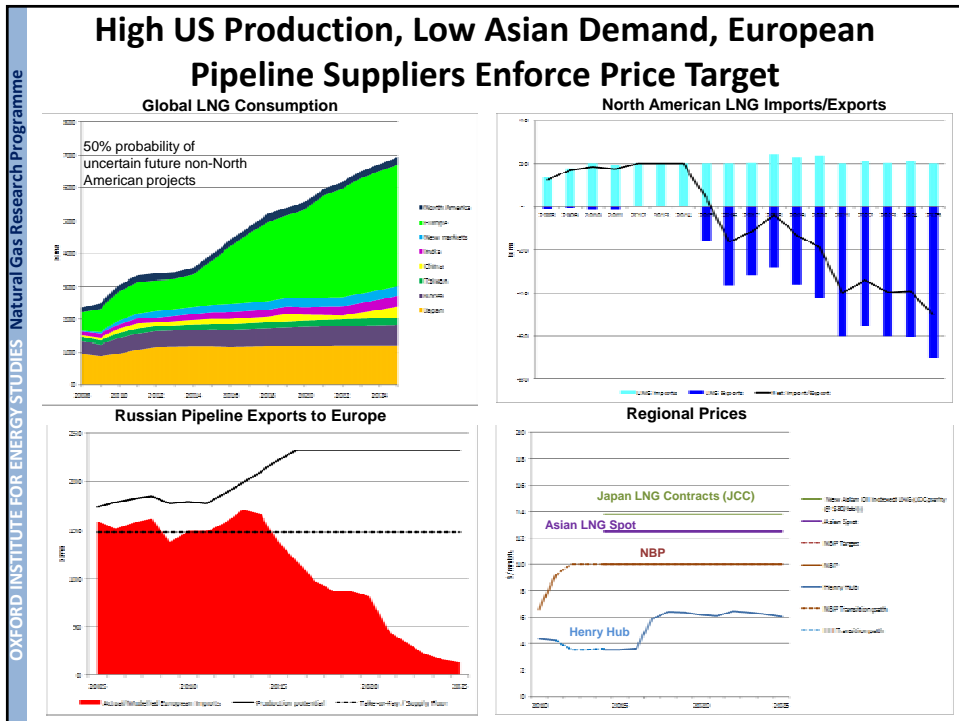
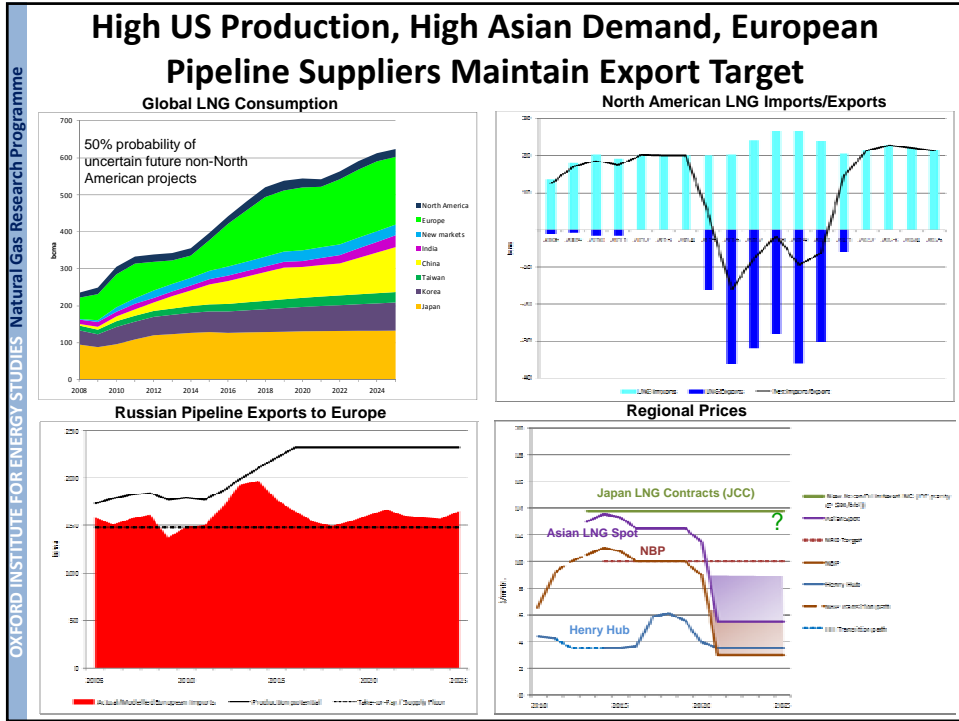


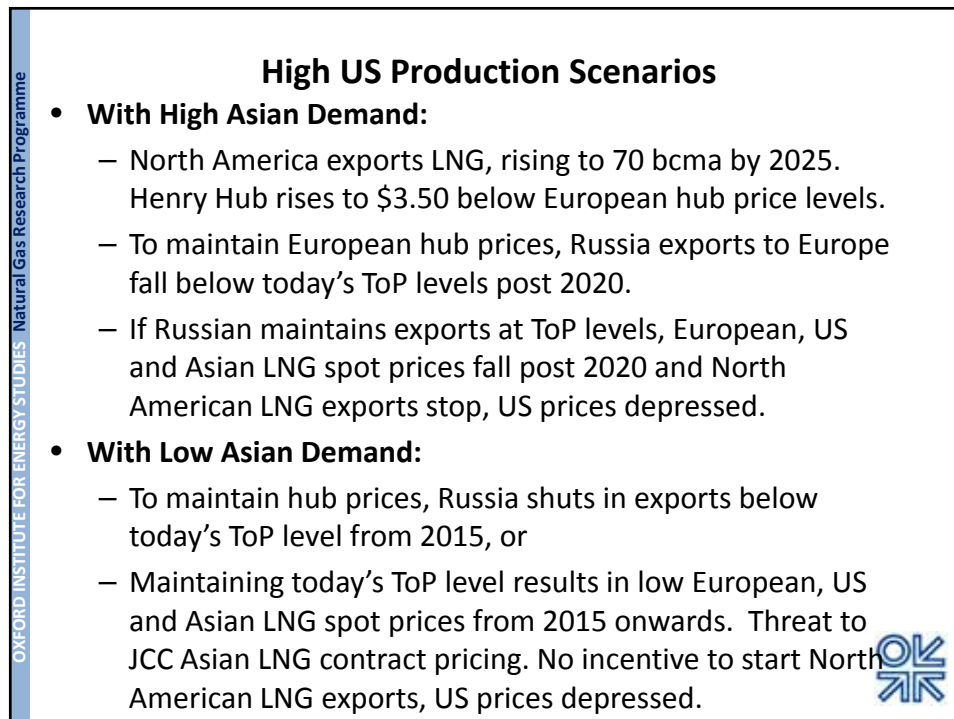
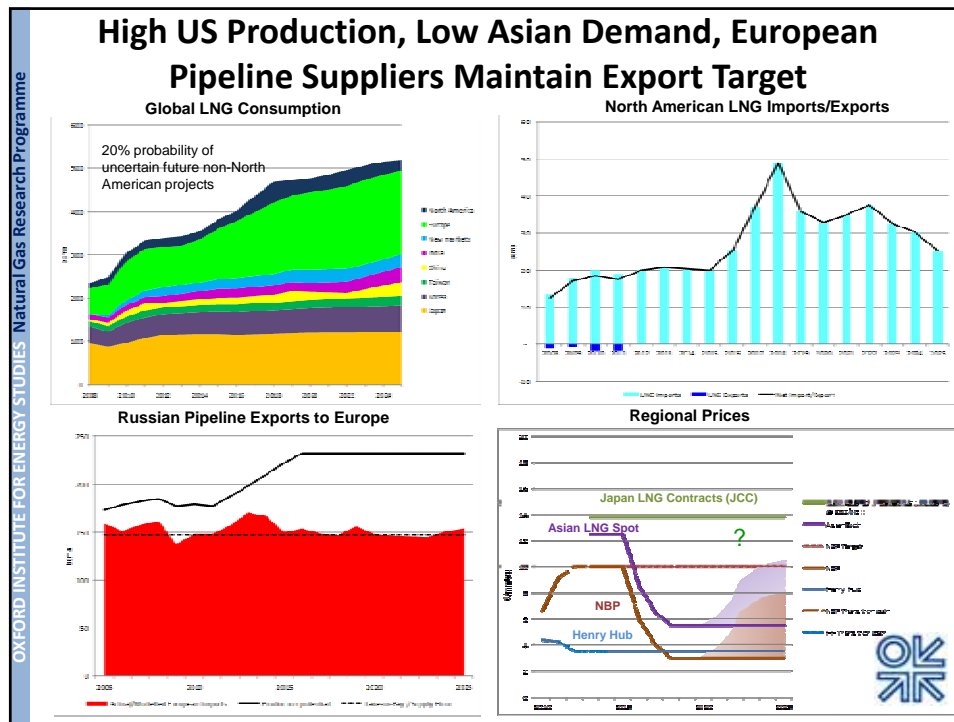
Low US Production Scenarios

- With High Asian Demand:
 - Russia comfortably above today's Take or Pay level to 2025.
 - US prices rise to above NBP around 2015 (to attract LNG imports)
- With Low Asian Demand:
 - To maintain hub prices, Russia shuts in exports to below today's ToP level, or
 - Maintaining today's ToP level results in periodic low European, US and Asian LNG spot prices.









If Oil Indexation Survives ?

- Economic Viability of Midstream buyers of Russian gas unlikely on following scenarios:
 - Low US Production, Low Asian Demand (2015+).
 - High US Production, High Asian Demand (2020+)
 - High US Production, Low Asian Demand (2015+)



Conclusions

- **The Past: European Gas Security of Supply = focus eastward on Russian supply capability and transit issues.**
- **The Future: What happens to US Production and Asian LNG Demand is at least as important.**
- **And these factors also challenge:**
 - Russia (in a post oil-indexation world – price vs volume)
 - Midstream buyers of Russian Gas if oil indexation survives
 - In the 'High US, Low Asian Demand Scenario' – the sustainability of the JCC paradigm for Asian LNG contracts.
- **The recent surge of LNG which 'rattled' the European market a foretaste of things to come ?**
- **NB These are scenarios to explore system dynamics; not predictions.**



Thank You
for your attention.

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