



Global Gas Markets: ‘Pulling in Opposite Directions at the Same Time’

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Bethesda, Maryland**

**EIA 2012 International Natural Gas Workshop
August 23, 2012**

Agenda

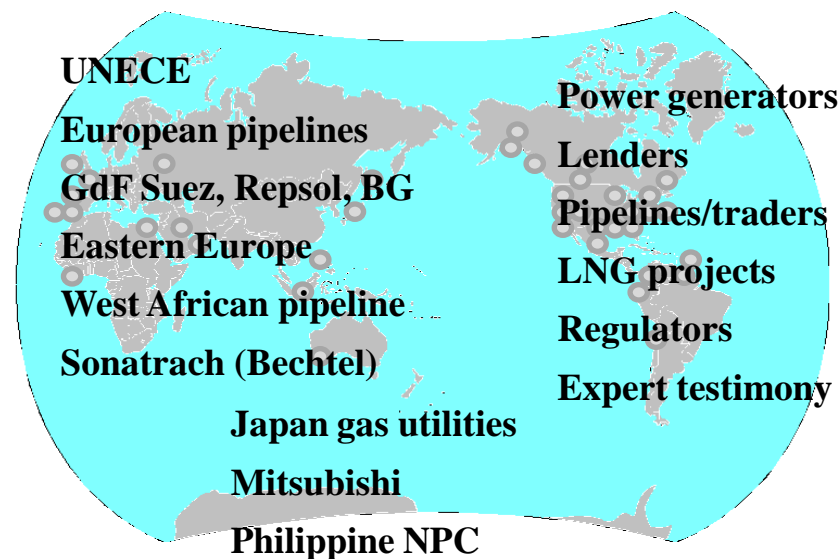
- ◆ Introduction
- ◆ Gas supply: shale gas (and shale oil)
- ◆ Gas demand
- ◆ Global markets and risks
- ◆ Discussion.

BSA – 28 years of gas and energy advisory services.

Expertise

- ◆ Economics, pipeline tariffs, contracting, price risks.
 - Research & training
 - Negotiation of gas contracts
 - Due diligence – Review for lenders in financing of LNG, power plants, gas storage
 - Expert in courts & arbitrations, testified in 16 jurisdictions.
- ◆ 500+ assignments, 27 nations.

Major Assignments

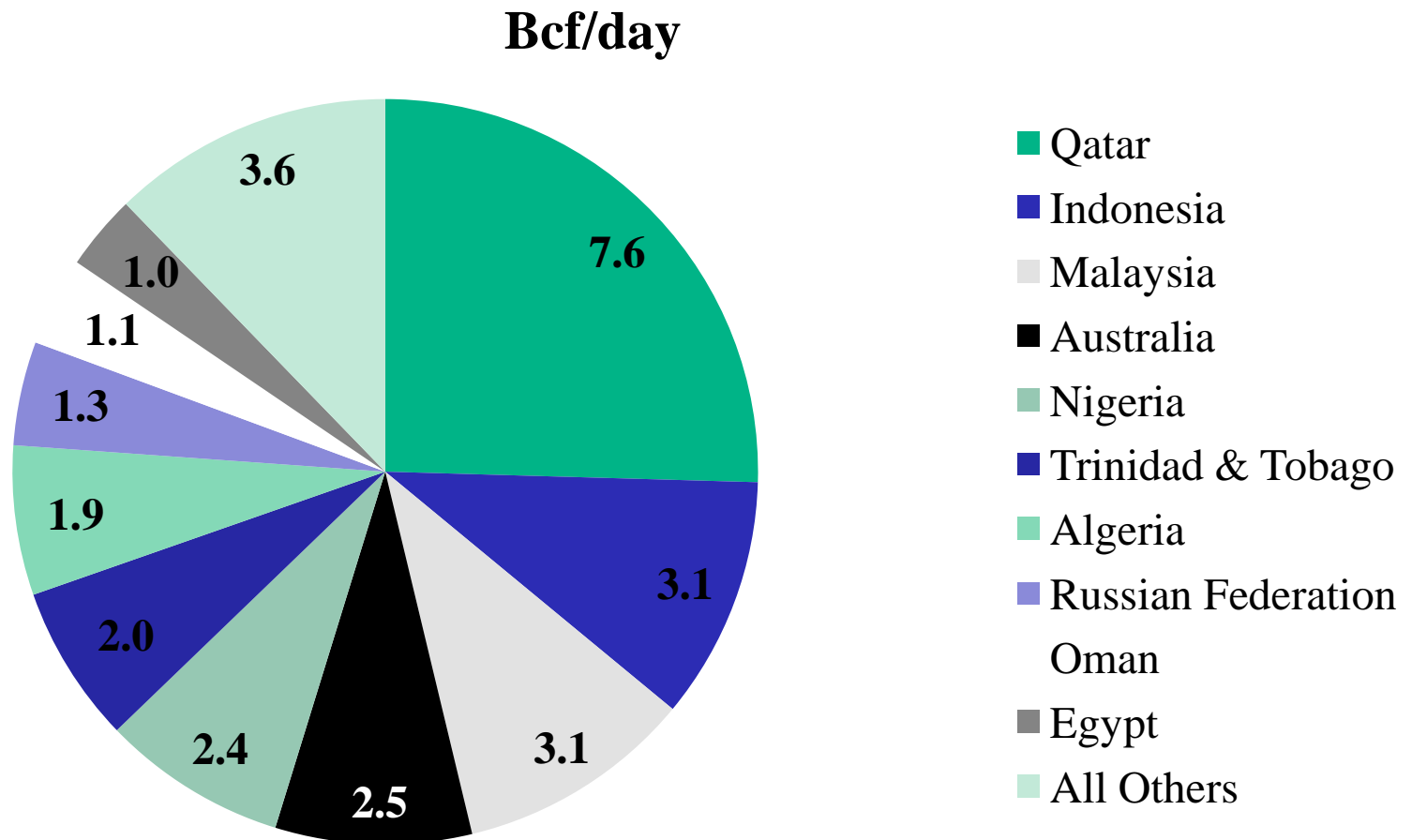


Clients: Energy buyers & sellers, electricity and heating plants, gas and oil pipelines, banks, governments, universities.

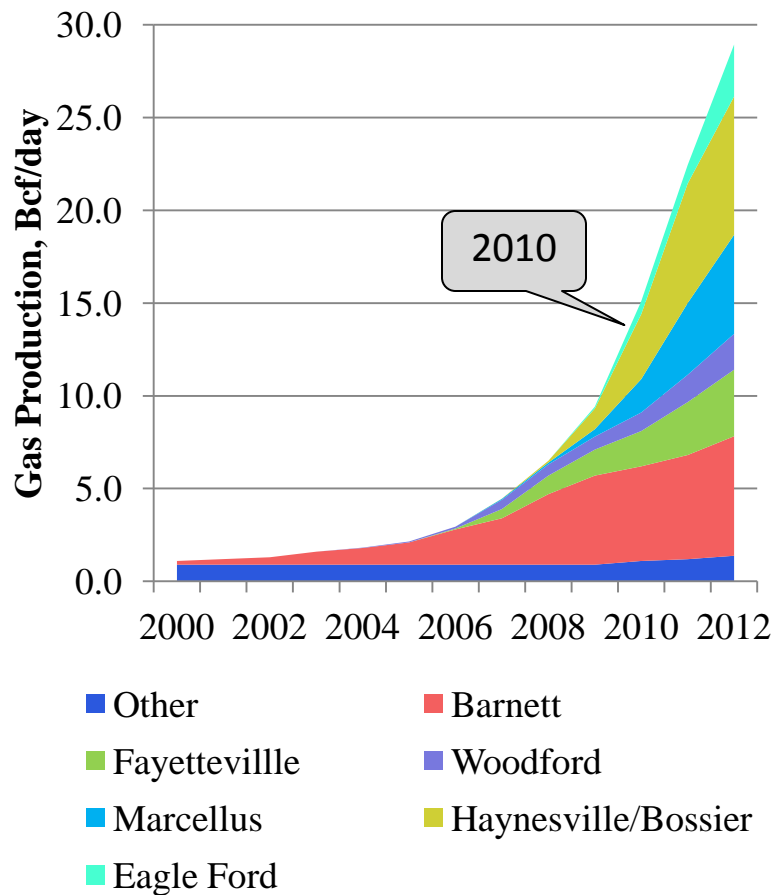
UN Economic Commission for Europe (ECE) 2012 LNG Report

- ◆ Current State and Prospects of LNG in the UNECE Region:
 - LNG Markets
 - The LNG chain
 - Regulation of LNG
 - Physical, operational issues
- ◆ Status: Fall 2012.

Qatar's 7.6 Bcf/day has balanced global LNG markets.

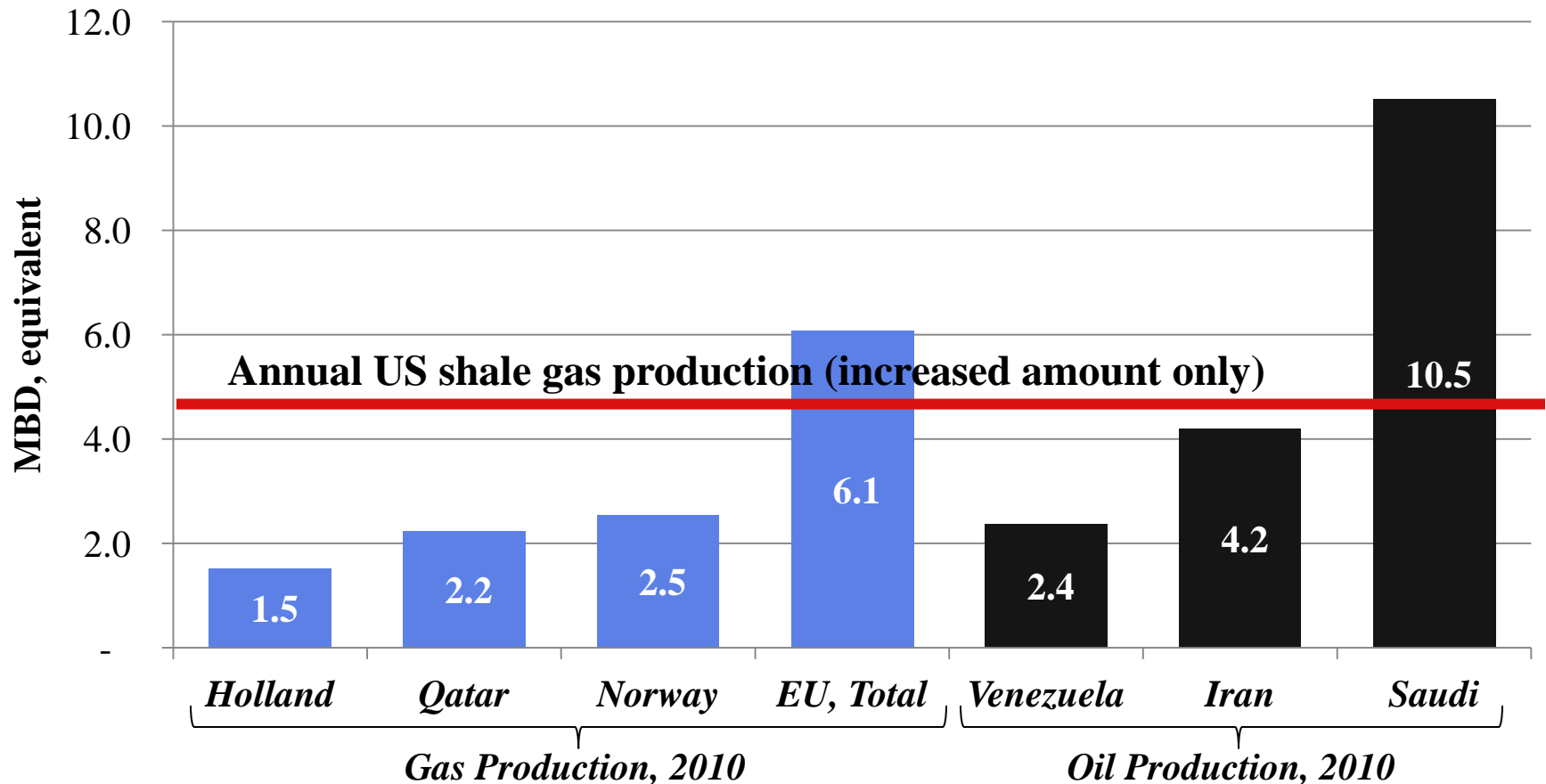


Shale gas revolution drivers – price, technology and market structure.

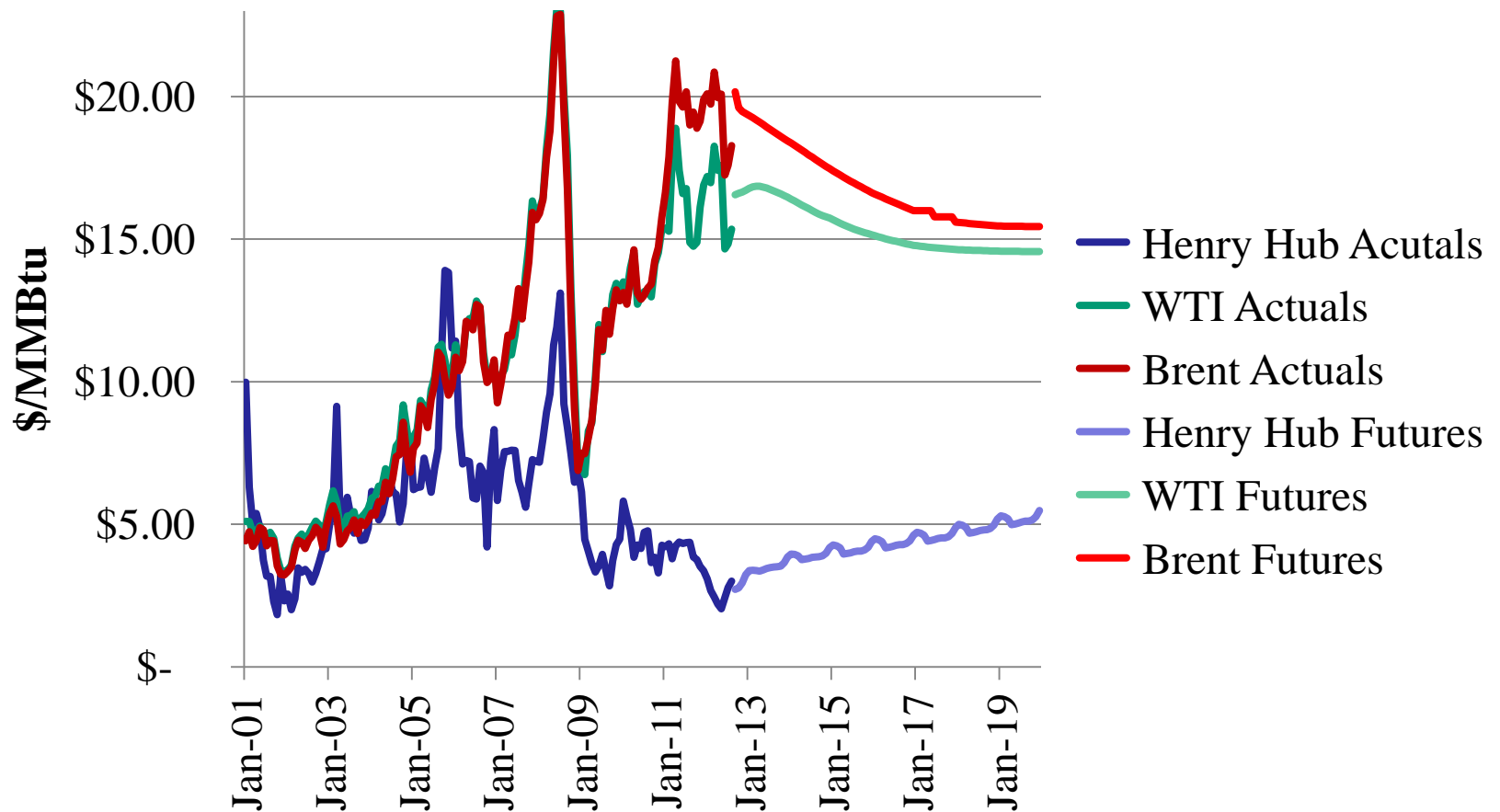


- ◆ Despite the words, Americans really don't have a grip on this.
- ◆ Most U.S. policy, economic, academic and government studies still rely on outdated information, e.g., from Internet/Google searches.
- ◆ This steep growth rate cannot and will not continue in the future.

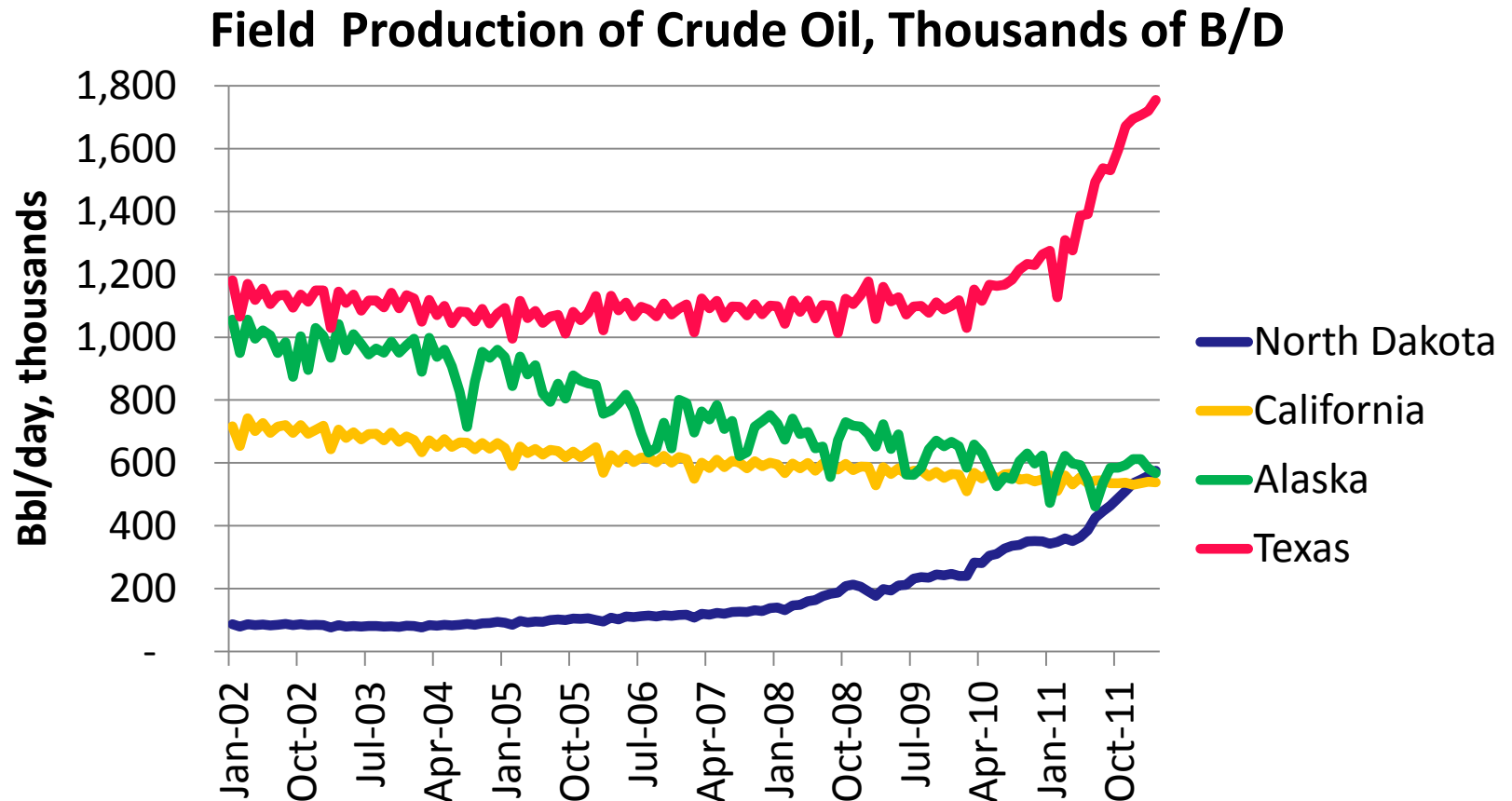
In gas alone, the US has added 4.8 MBD equivalent since 2002.



North America's hydrocarbons price gap is crippling natural gas E&P.

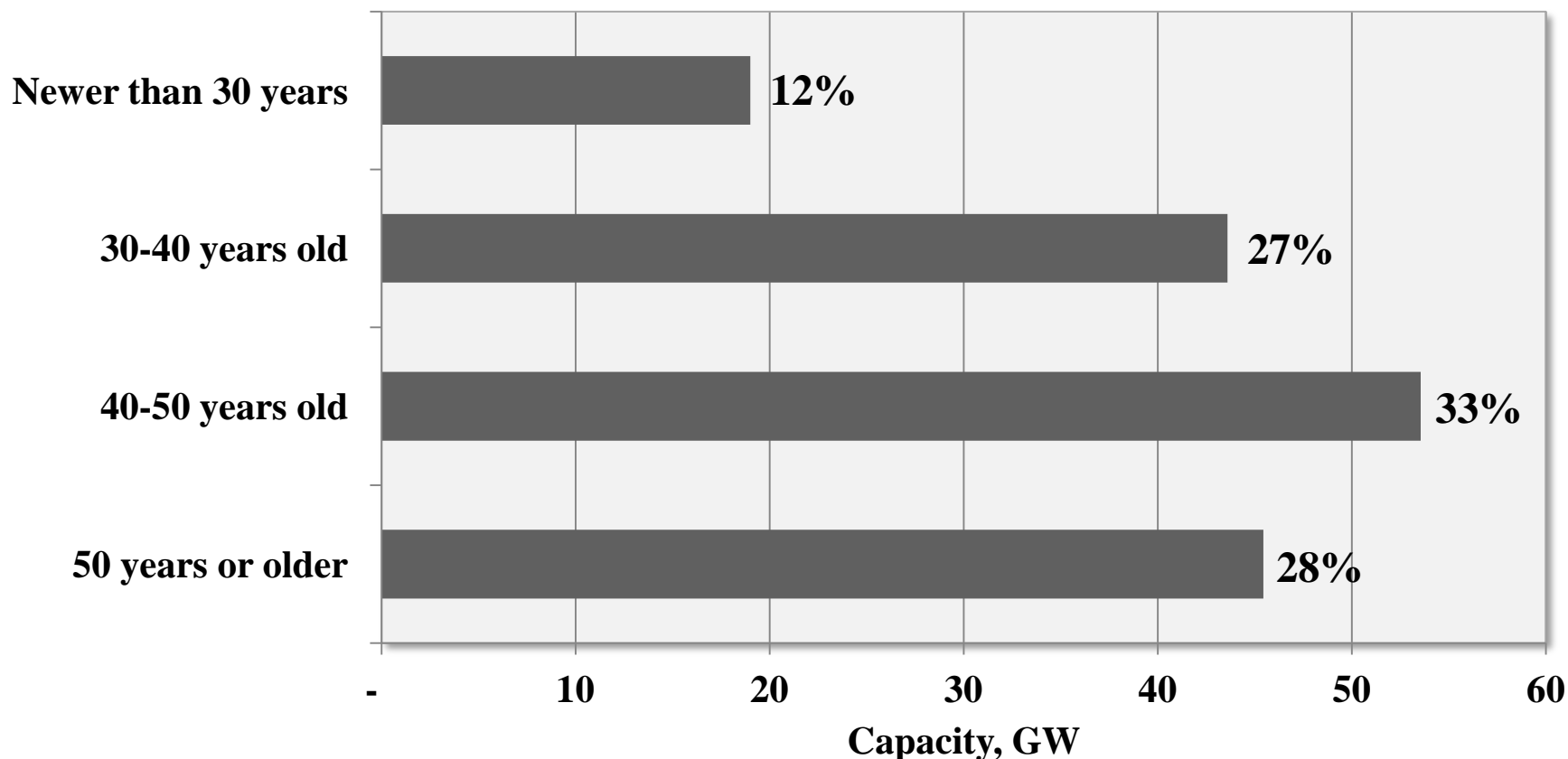


Shale-rich North Dakota is now the 2nd largest US oil-producing state.

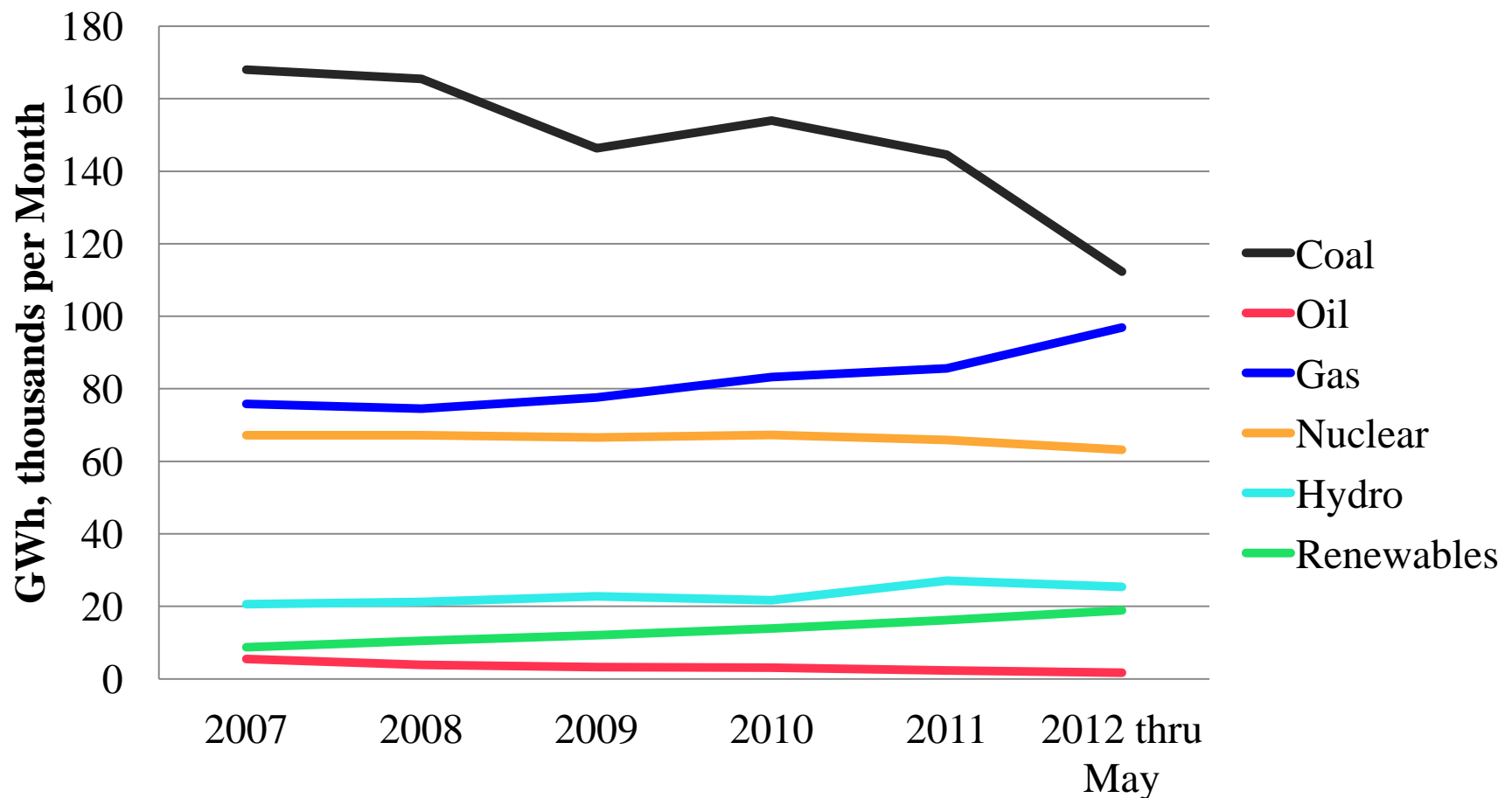


Most surplus gas will be spent replacing coal in aging power plants.

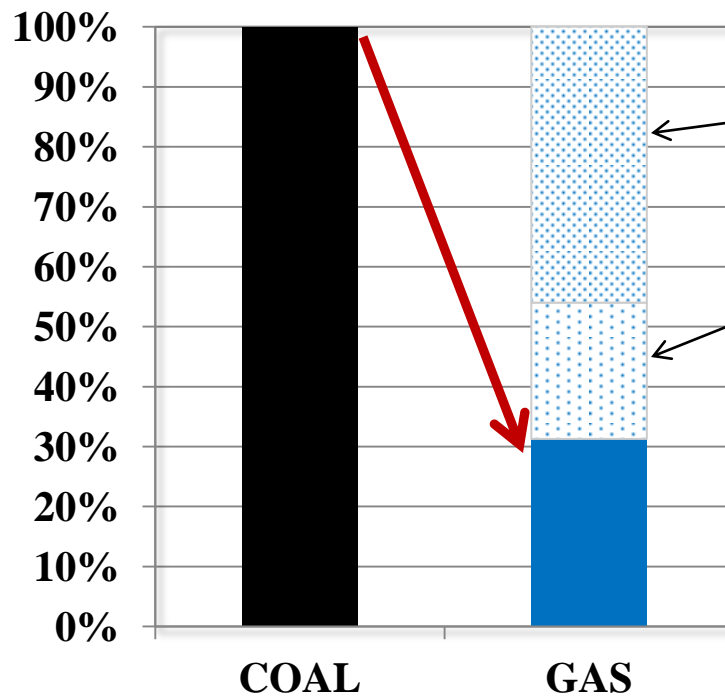
Age of Coal-Fired Power Plants in “Coal Country”



Old King Coal has been dethroned in US electricity generation.



Replacing old coal with new gas cuts CO₂ emissions by 70%.



◆ Carbon emissions:

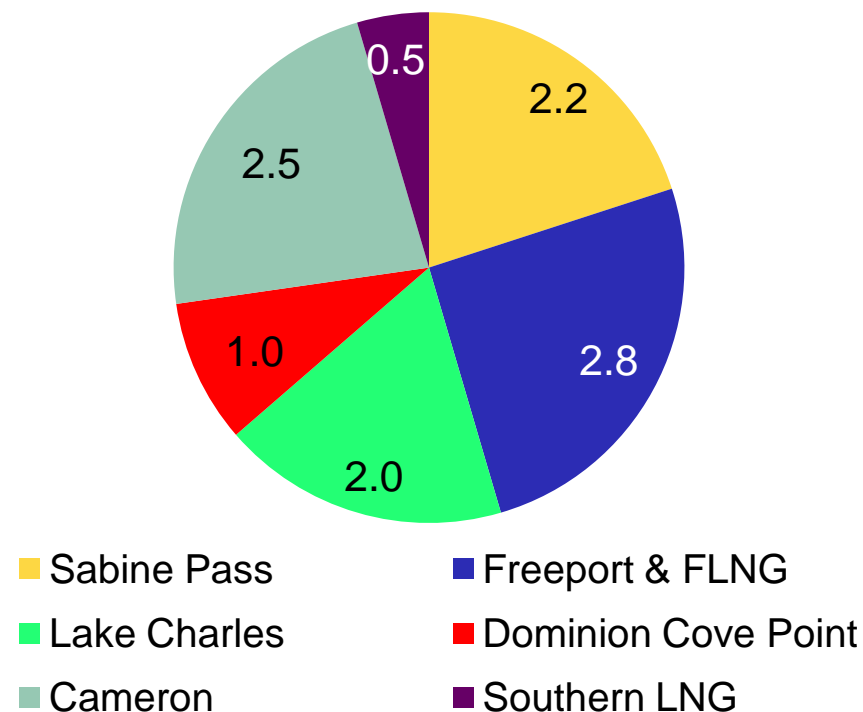
- Chemical advantage: Gas burning emits 46% less CO₂ than coal.
- Efficiency advantage of new gas CCGTs versus old coal boilers: 55-60% vs. 31-33%.
- Carbon emissions savings from fuel cycle as well.

◆ Other pollutants reduced or prevented, especially sulfur, particulates.

Market dynamics suggest 6-7 Bcf/day can readily be sold abroad.

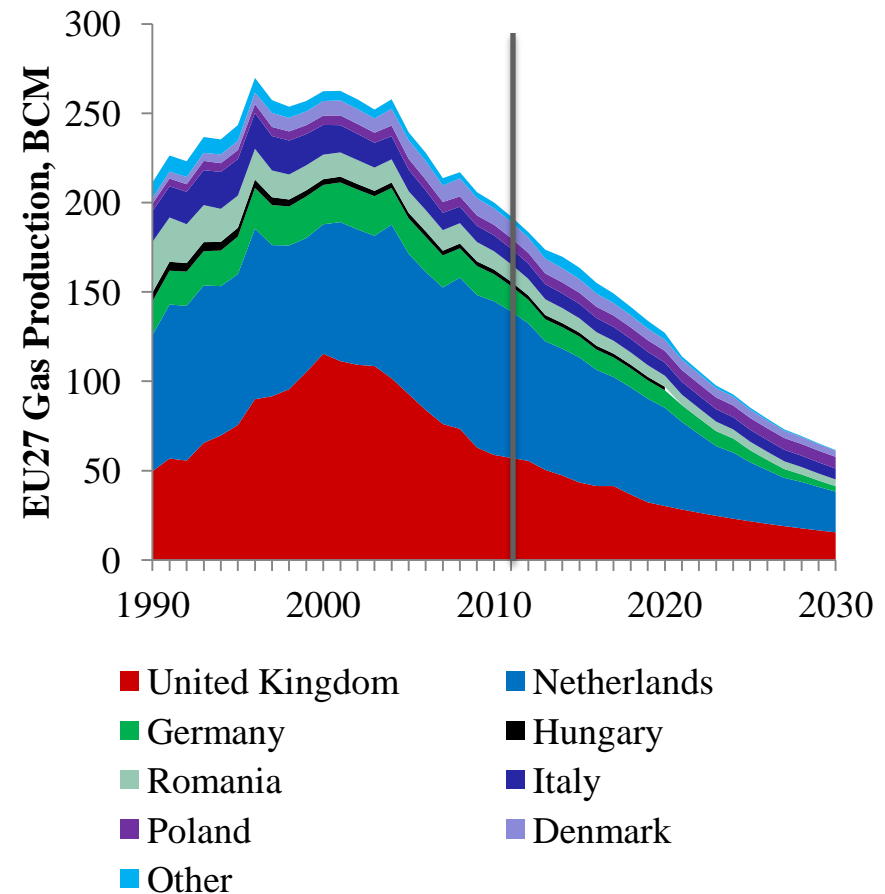
- ◆ Status = inevitable:
 - All six “brownfield” projects are approved for free-trade partners
 - Sabine Pass is fully approved
 - FID will depend on commercial throughput contracts.
- ◆ In Canada, Kitimat is approved.
- ◆ US politicians argue about impact on gas, electricity prices
- ◆ But gas prices are already unsustainably low.

**US LNG Export Applications,
11 Bcf/day**

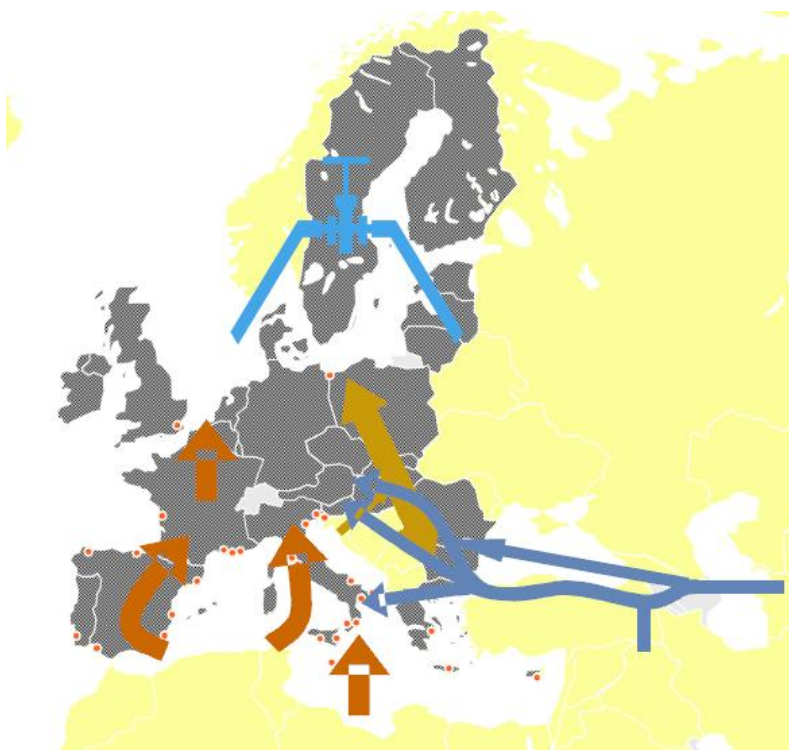


Europe's demand for US imports will rise with supply & nuclear issues.

- ◆ Plunging European gas production is intensifying winter supply crises, and is building LNG demand.
- ◆ In less than a decade, the UK has transformed from exporter to LNG importer on scale soon to exceed Spain.
- ◆ The Nord Stream pipeline entered partial service in June 2011; other lines are planned from the Middle East.



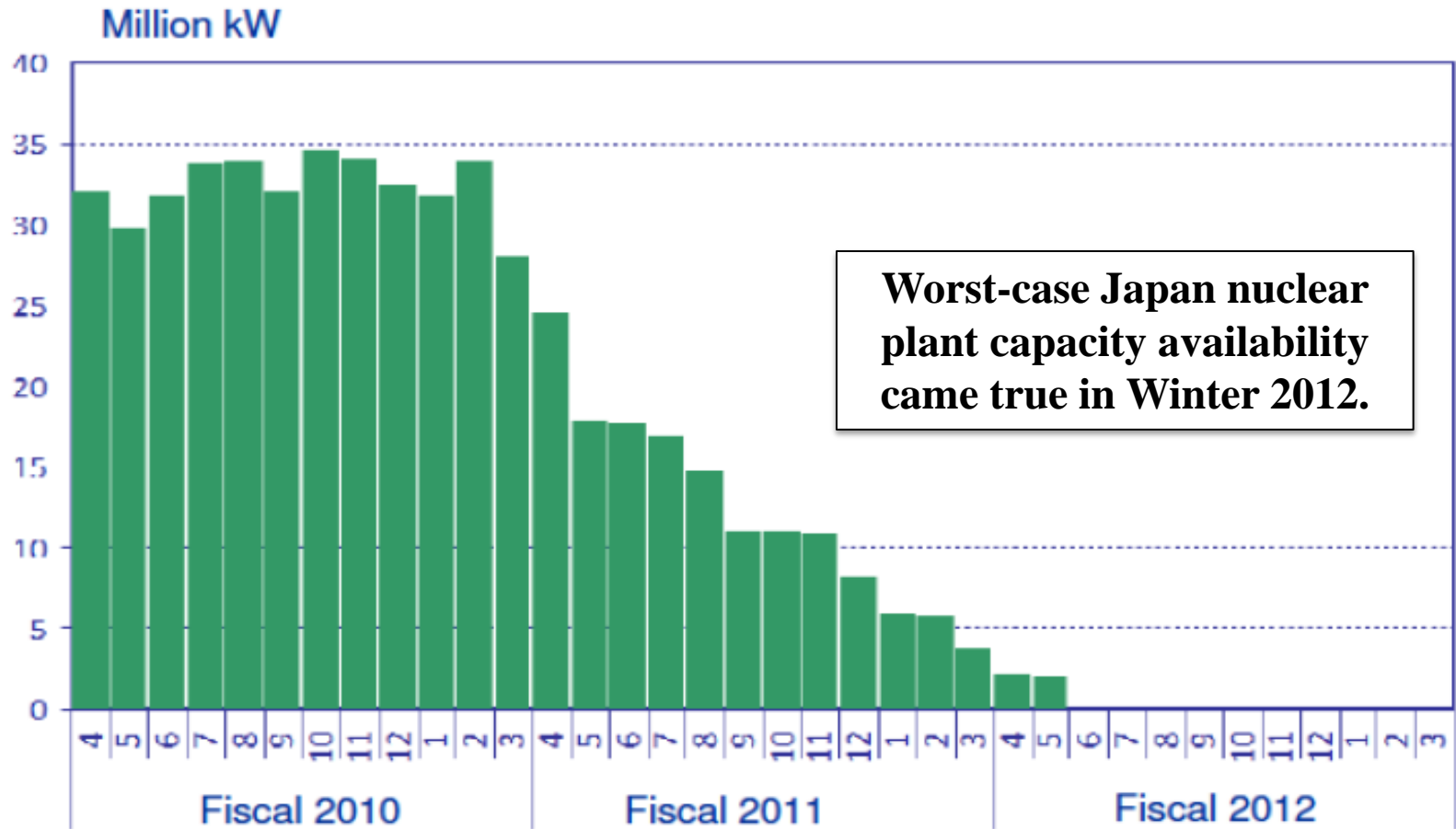
European gas trading caught hold in the 2009 recession..



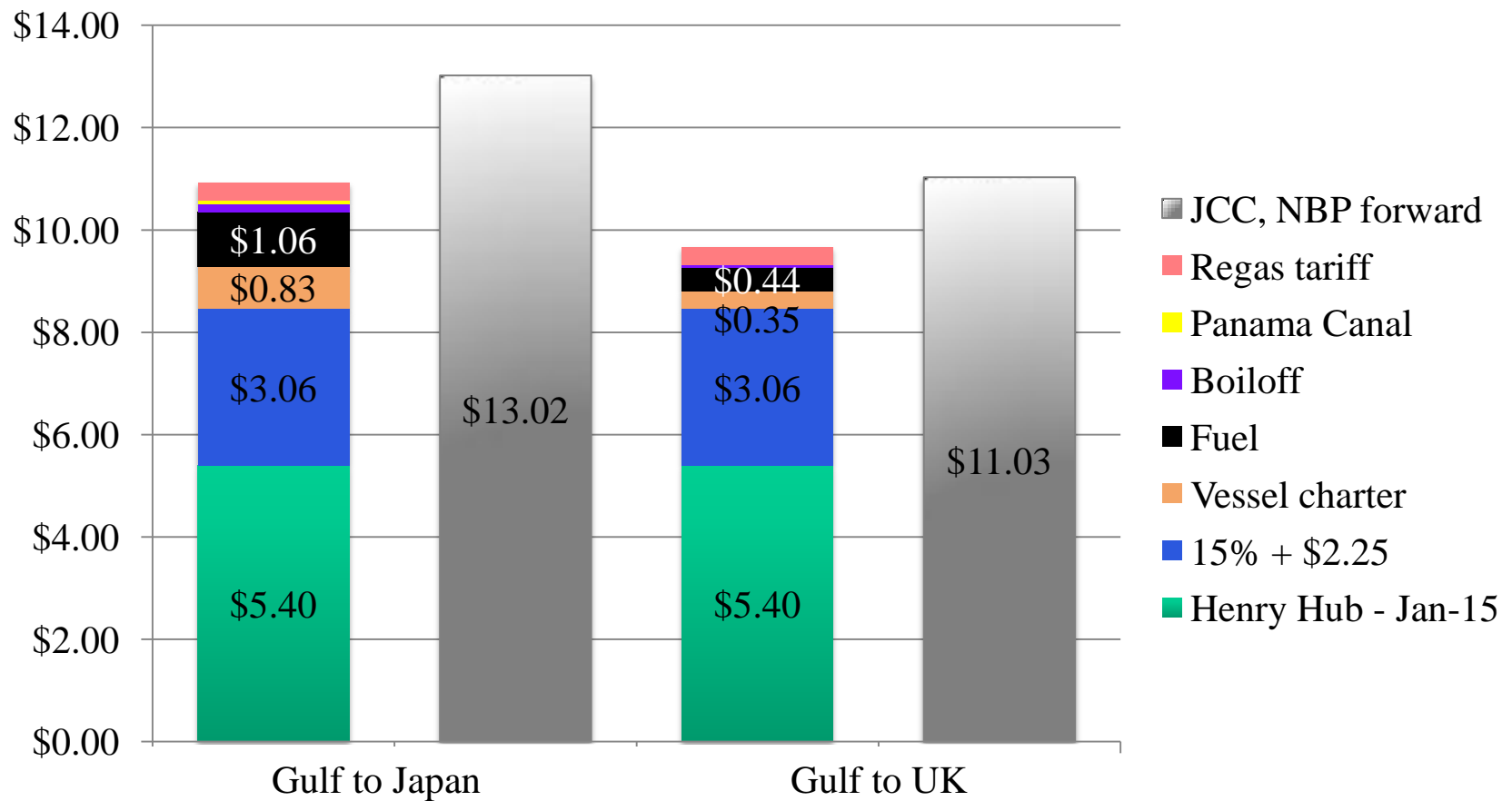
Source: EU Sept 2011, courtesy Gas Strategies, Ltd.

- ◆ Russian gas dominates at oil-indexed prices
- ◆ Northwestern points emulate the contract market:
 - NBP, the marker, is no Henry.
 - Even less liquidity at TTF, Zeebrugge, Gaspool.
- ◆ Spain is 80% LNG-based.
- ◆ EU's grand plans for gas infrastructure are encumbered by market mechanics.

Fukushima's impact on gas demand cannot be understated.



Exports of LNG from the US will remain in the money through 2020s.



Conclusions & Thoughts:

- ◆ US shale gas production is here to stay, but increases will soon flatten: the solution to low prices is, of course...low prices!
- ◆ Shale is changing US role in energy, with deep impact on fossil fuel, renewables, energy financings, balance of trade, security.
- ◆ Most reporters are behind the curve, blindsided and confused.
- ◆ The world has huge shale resources, but equally huge barriers, hence little risk to US exports till late 2020s.
 - Institutional and cultural impediments, generally closed gas markets, public royalties, other priorities, lack of a competitive E&P sector.
- ◆ US exports will be muted as the surplus is spent at home in CCCTs and, later, directly as LNG and CNG vehicles.



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