

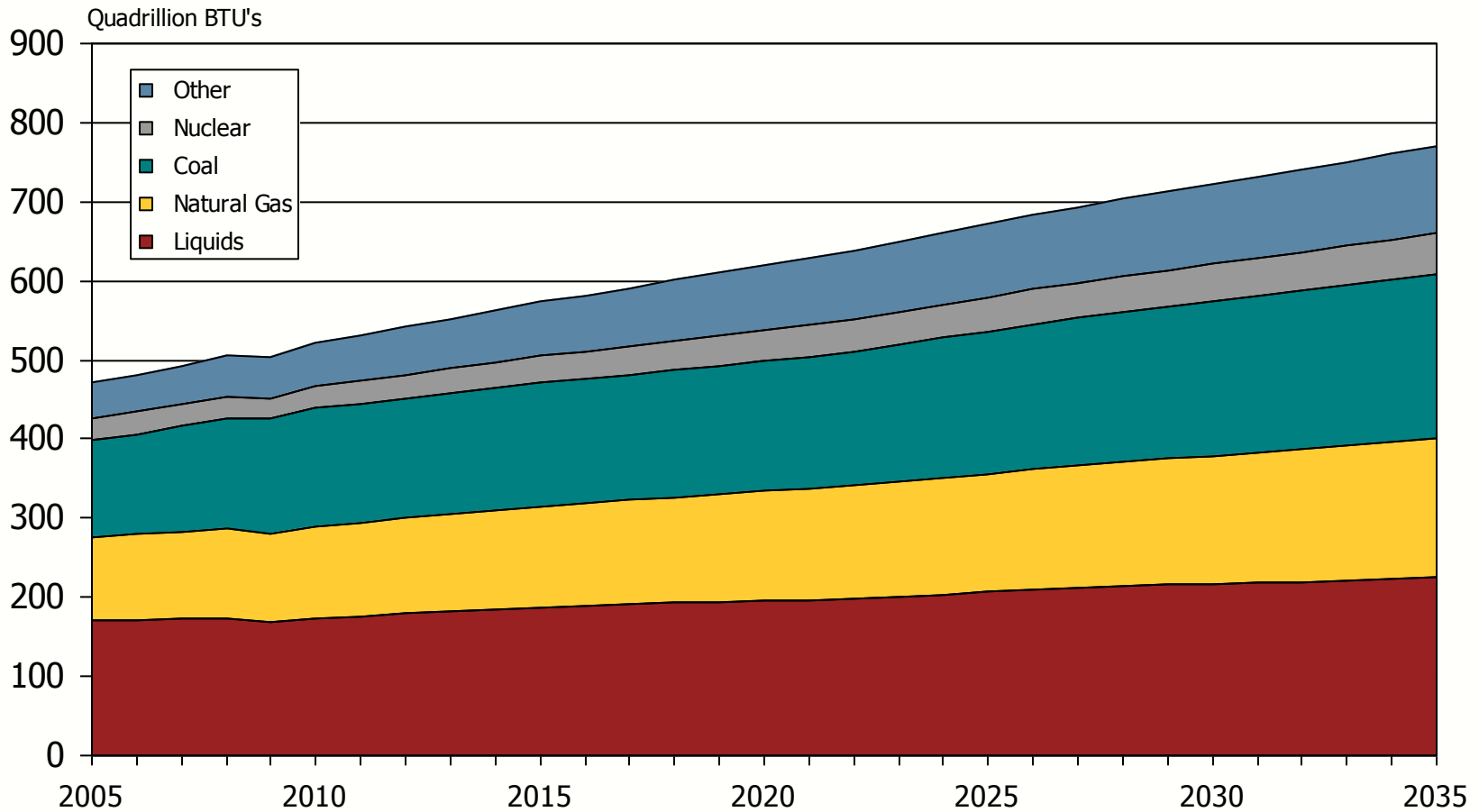
A photograph of a shale gas drilling rig in a rural field under a cloudy sky. The rig is a tall, metal structure with a red top, situated in a green field. In the background, there are other smaller structures and a fence line. The sky is blue with large, white, fluffy clouds.

The Shale Gas Revolution

PNWER 2012 Annual Summit

Tom Huffaker
Vice President
Policy & Environment

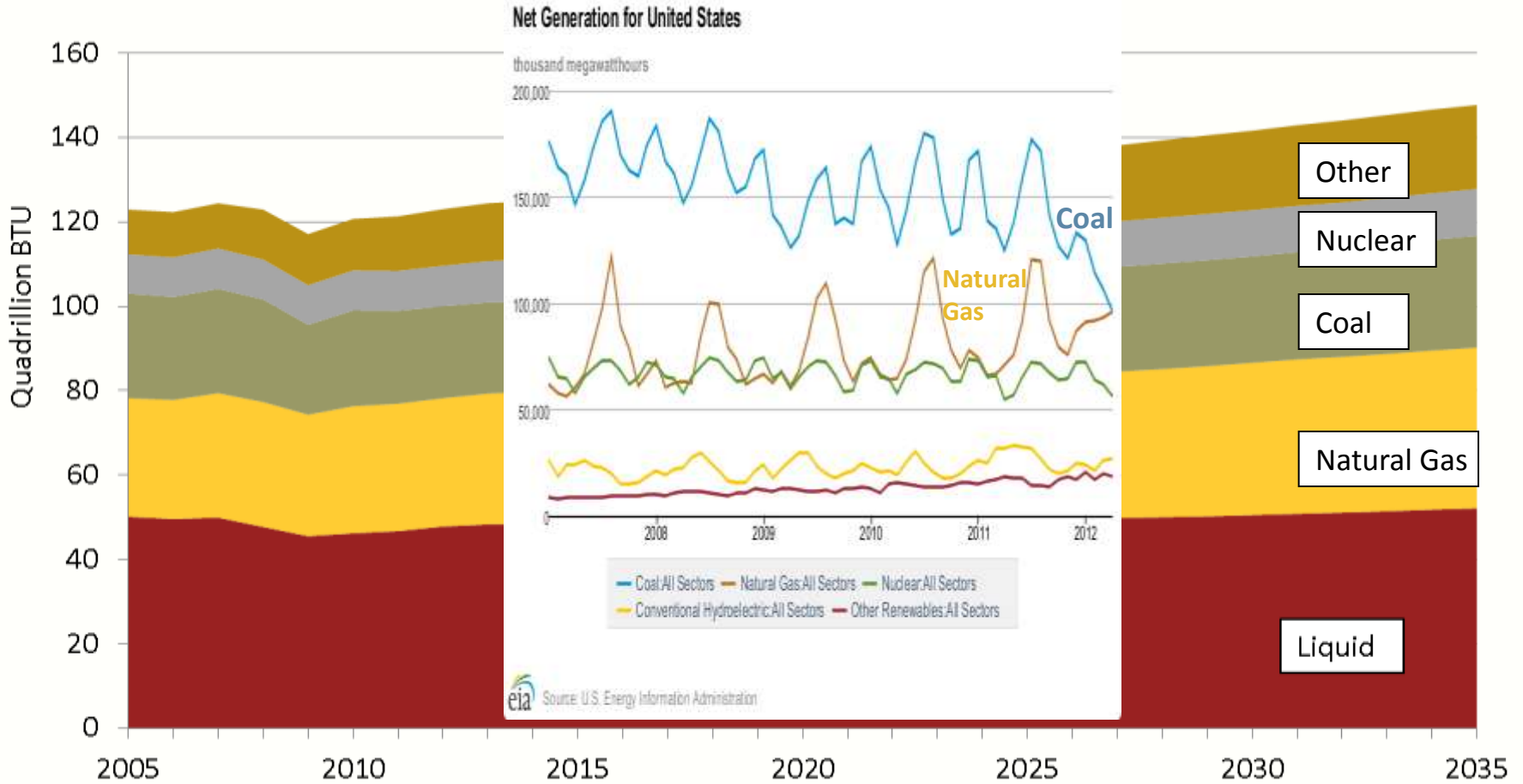
Global Energy Demand (Reference Case Scenario)



Source: U.S. EIA International Energy Outlook 2011

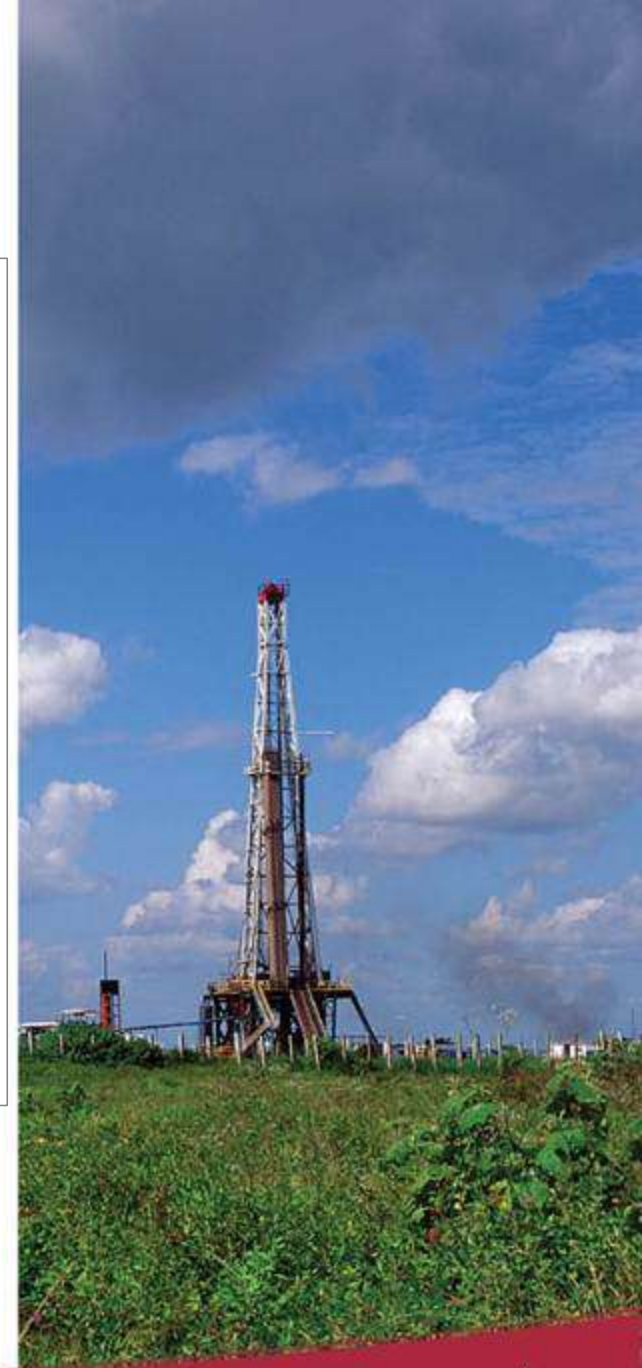
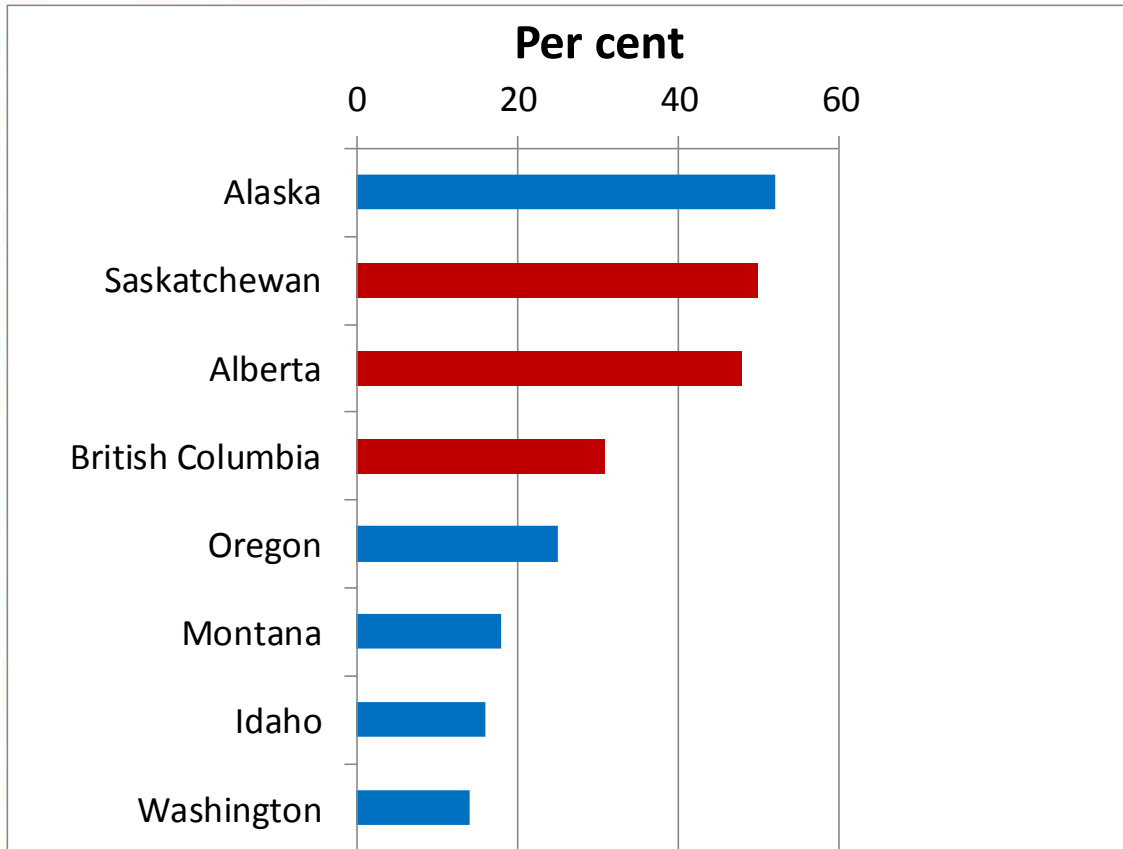
North American Primary Energy Demand

Natural Gas generates as much electricity as Coal



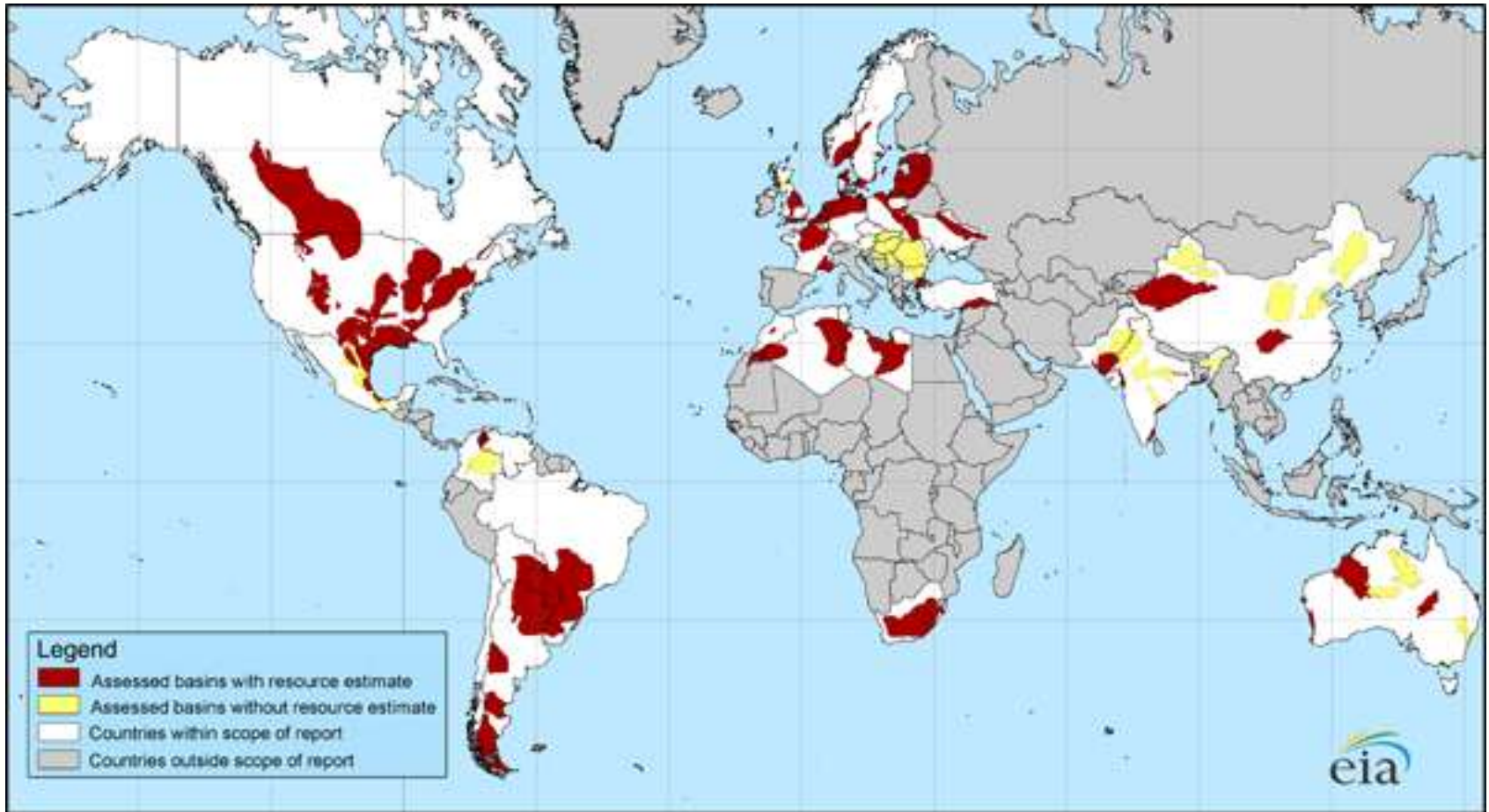
Source: U.S. DOE - Energy Information Administration
International Energy Outlook Sept. 2011

Natural Gas – Share of Primary Energy Consumption



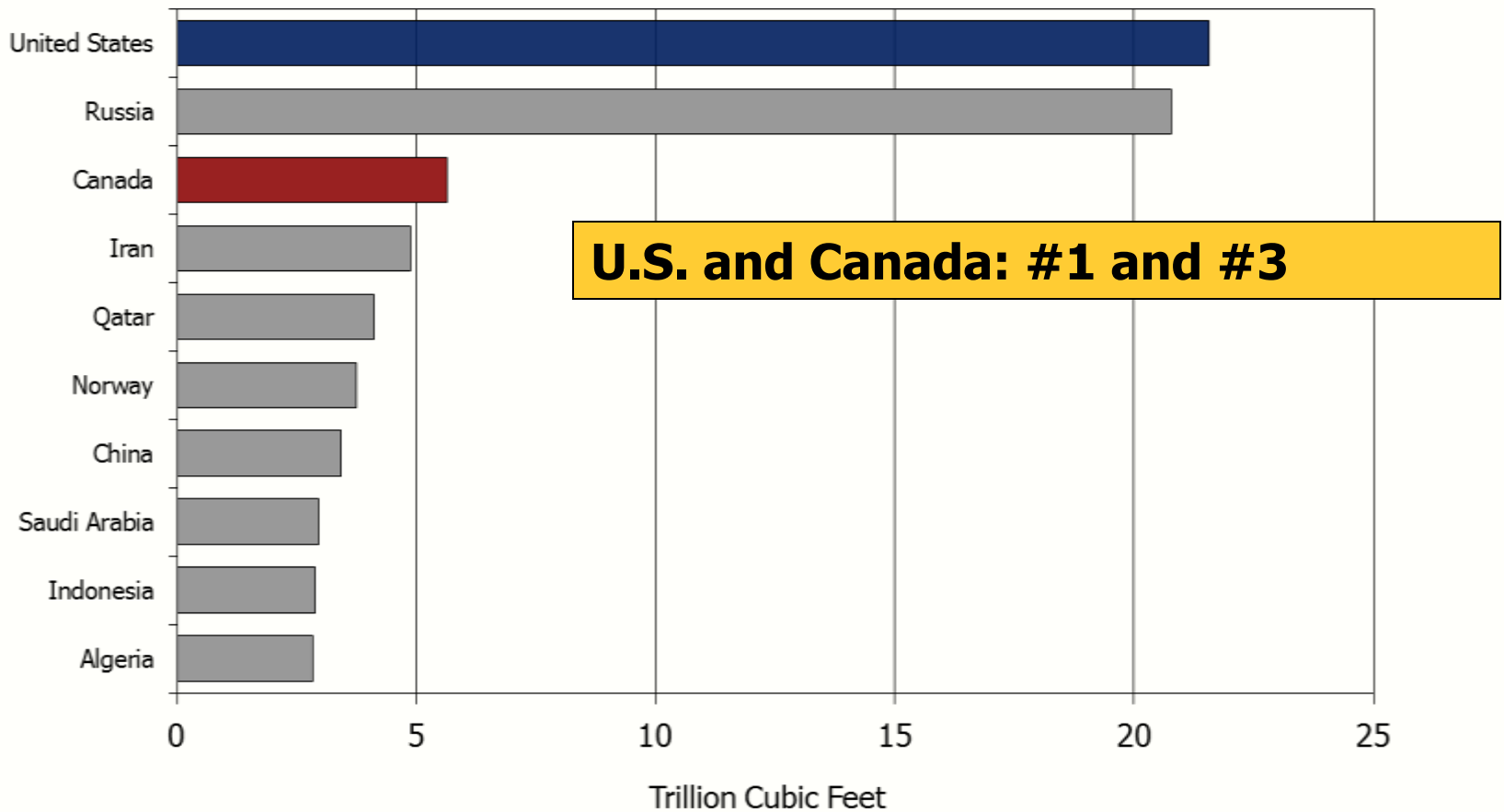
Global Shale gas resource is vast – EIA

Technically recoverable – 5,760 tcf (outside U.S.)



Although the shale gas resource estimates will likely change over time as additional information becomes available, ***the report shows that the international shale gas resource base is vast.*** The initial estimate of technically recoverable shale gas resources in the 32 countries examined is 5,760 trillion cubic feet. EIA

Top 10 World Natural Gas Producers



Source: BP Statistical Review 2011

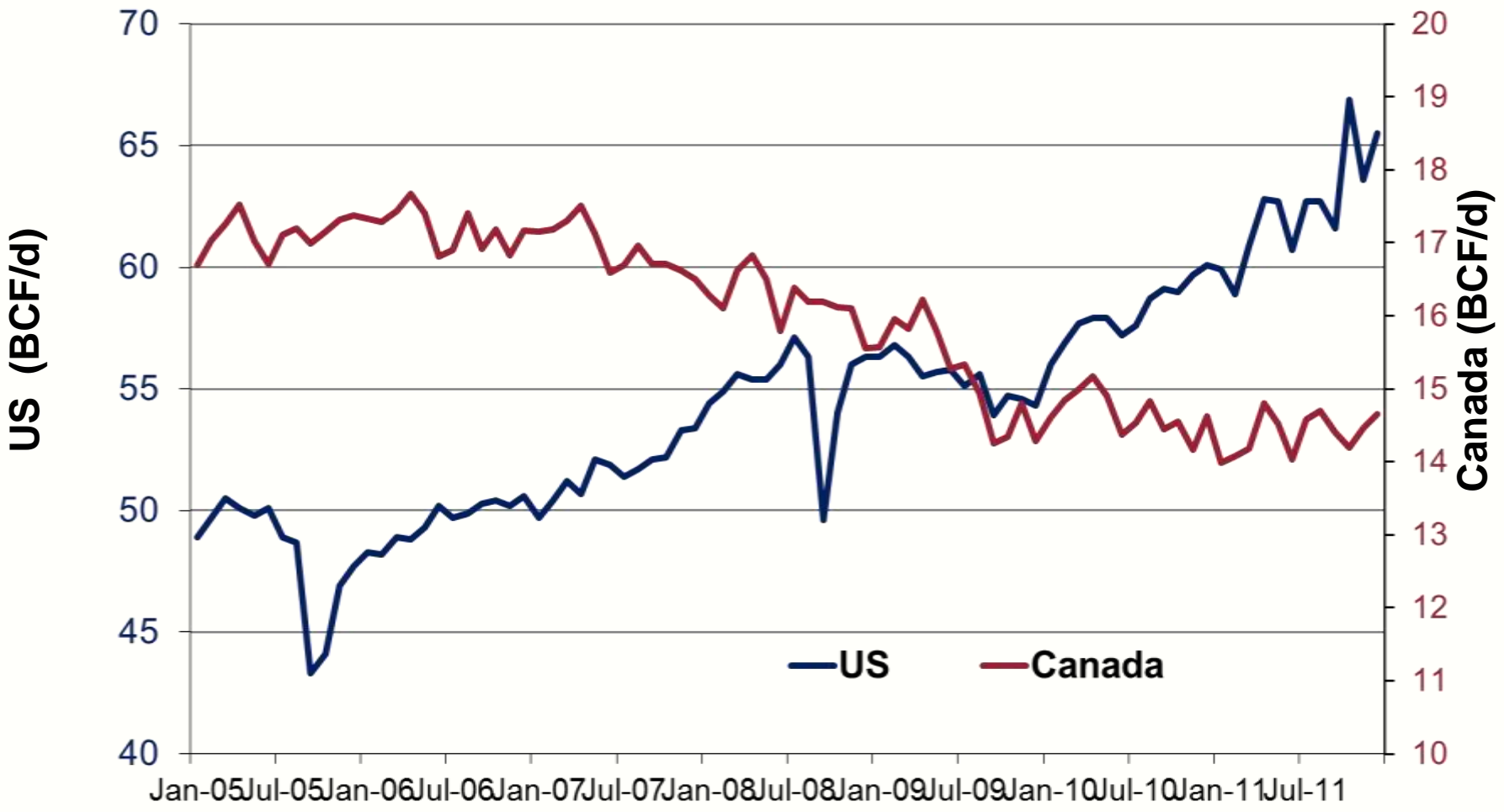
North American Natural Gas – Supply Outlook

- Shale gas supply a game-changer
- Technology breakthroughs
- New producing regions
- Shifting S/D dynamic
- Emerging stakeholder environmental concerns (footprint, water – use & quality, seismicity)



Canada losing ground to U.S.

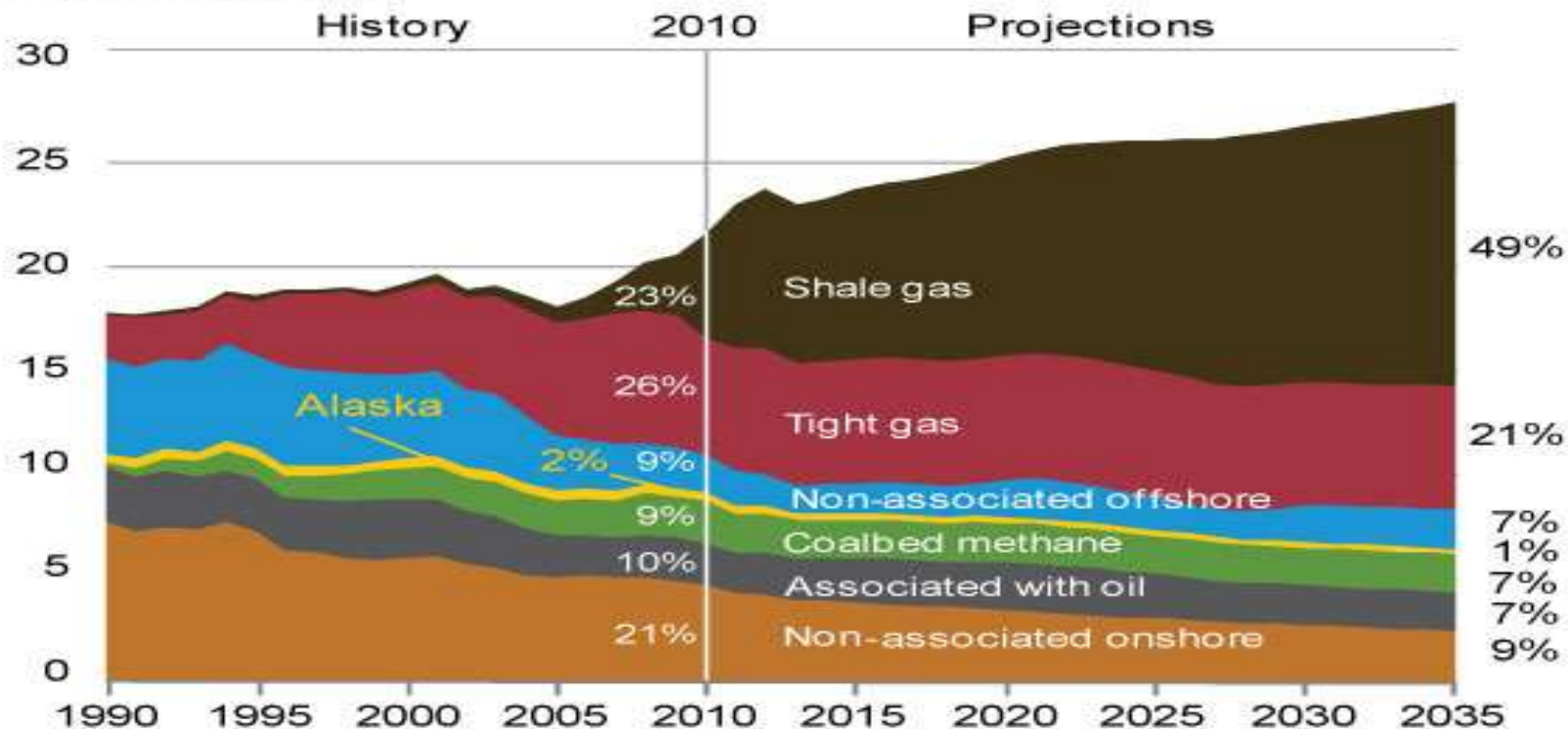
Canadian Production *down* 15% while U.S. Production *up* 35%



Shale Gas becoming dominant in North America

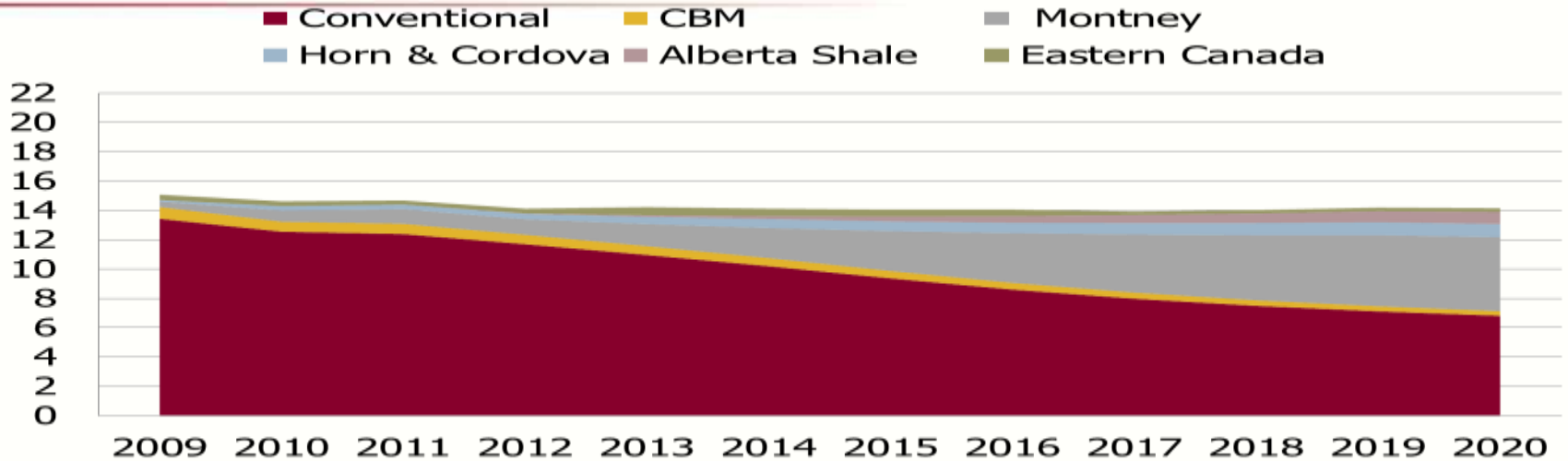
U.S. Natural Gas Production, 1990-2035

trillion cubic feet

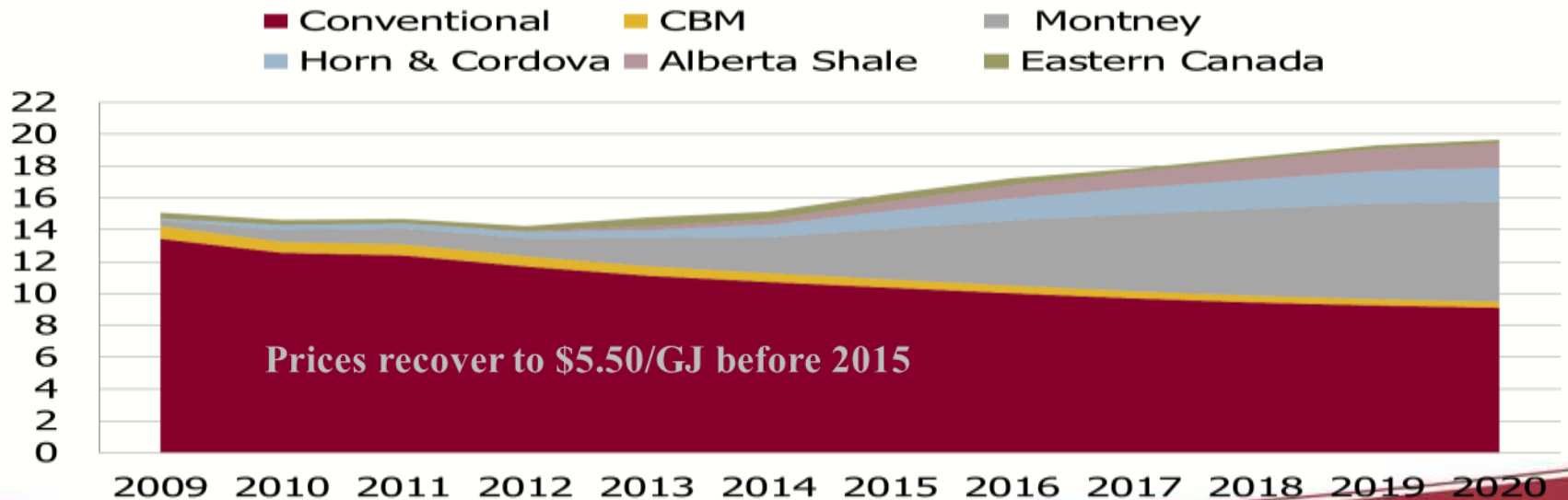


Source: U.S. Energy Information Administration, AEO2012 Early Release Overview, January 23, 2012.

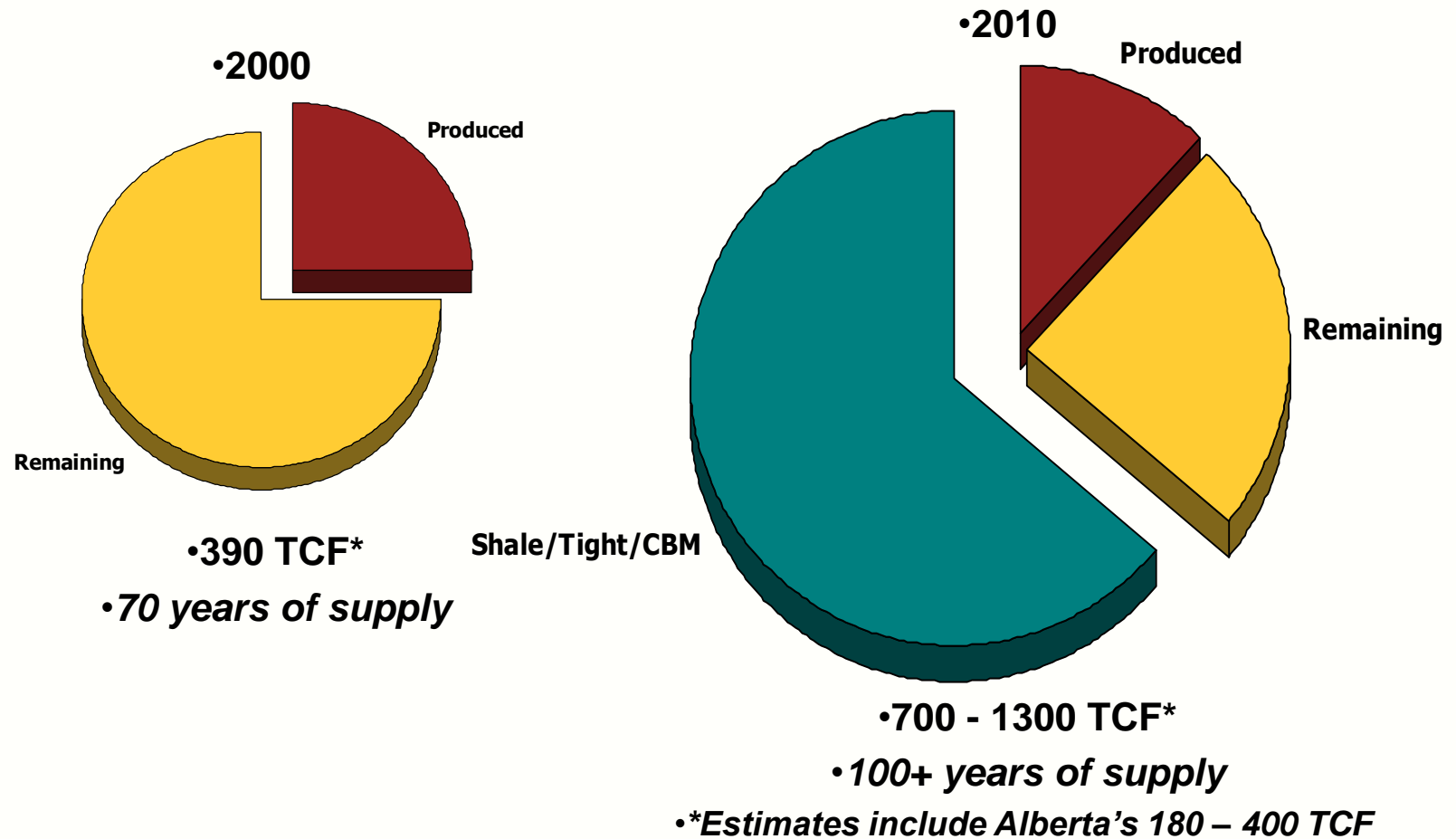
Canadian Natural Gas Production Bcf/day



Prices remain below \$4.00/GJ for the forecast period



Canadian Natural Gas Resource is Growing

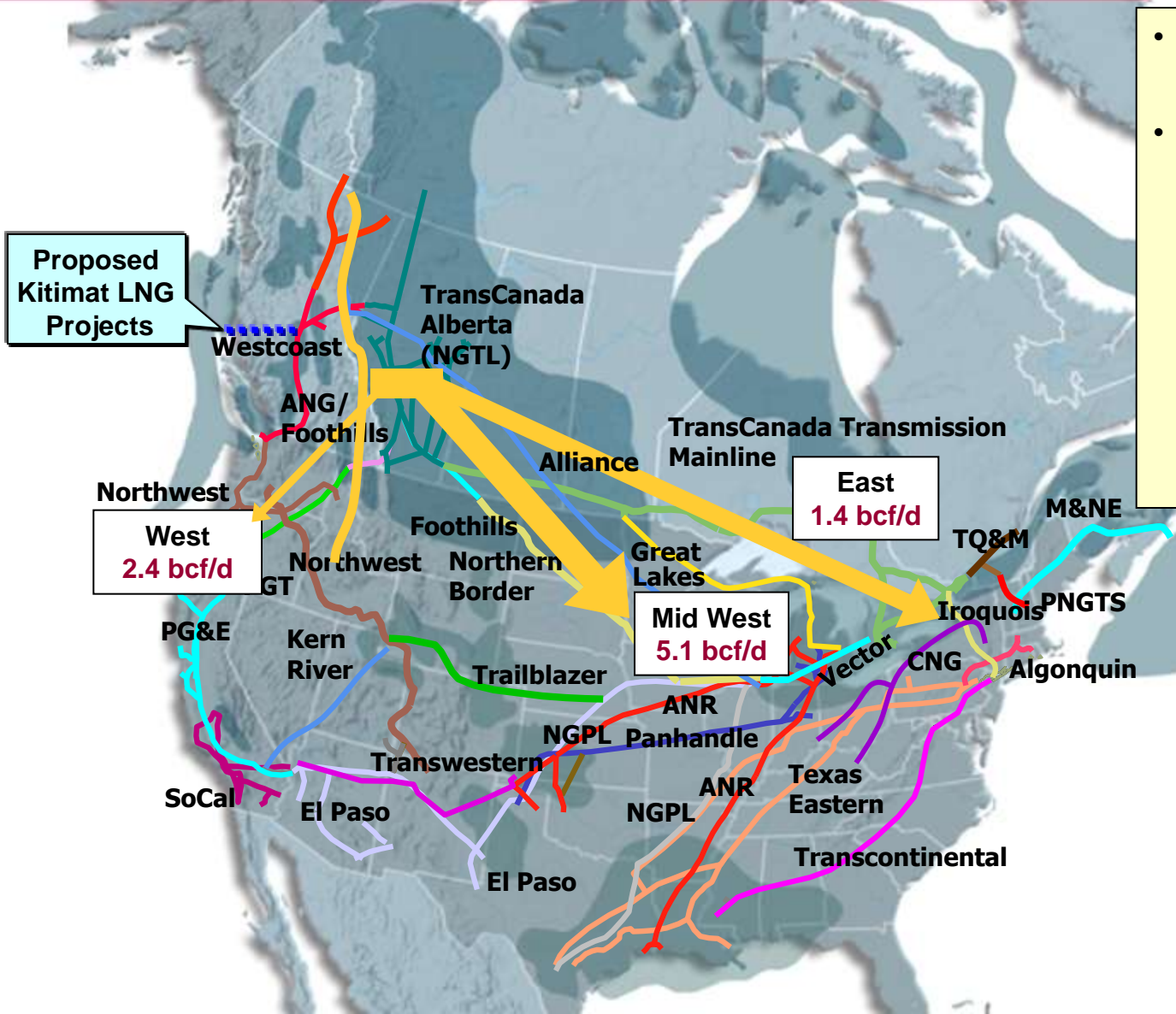


- **Technological advances have “unlocked” vast unconventional gas resources.**

•*Estimated Recoverable Marketable Gas:

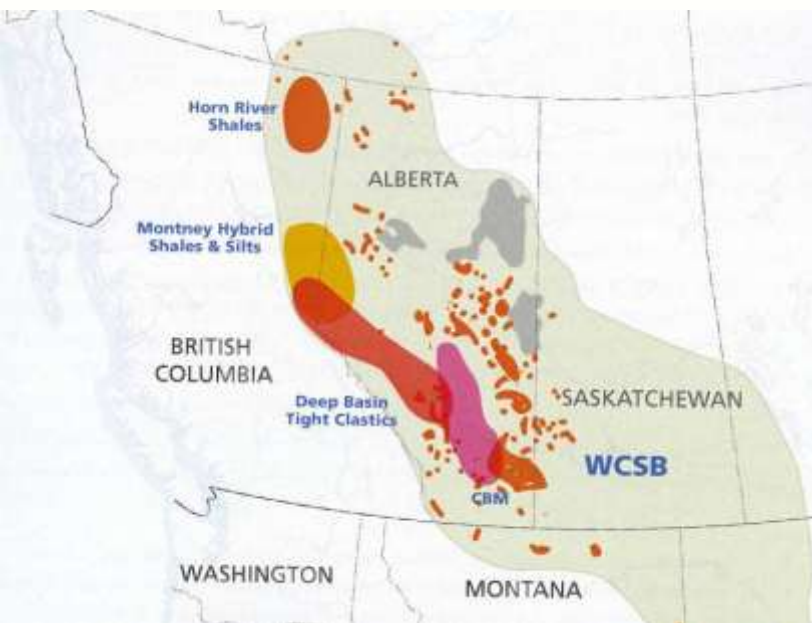
• Source: CSUG

N.A. Natural Gas Pipelines & 2011 Cdn. Exports to U.S. (bcf/d)



- Existing infrastructure serves N.A. markets.
- Changing S/D dynamics necessitate market growth:
 - N.A. (transportation, power)
 - LNG Exports (price, takeaway)

Canada's LNG Export Opportunity



Primary Drivers:

- Large Resource Potential
- **522 Tcf** of Conventional Natural Gas (**346 Tcf** Remaining)
- **376–947 Tcf** of Unconventional Natural Gas
- Geographical Proximity to Asian Markets
- Growing Competition within North American Market
- Rapid Growth in World LNG Trade
- Foreign Investment playing an important role in developing large unconventional resource base in N.E. British Columbia

Potential Canadian West Coast LNG Terminals



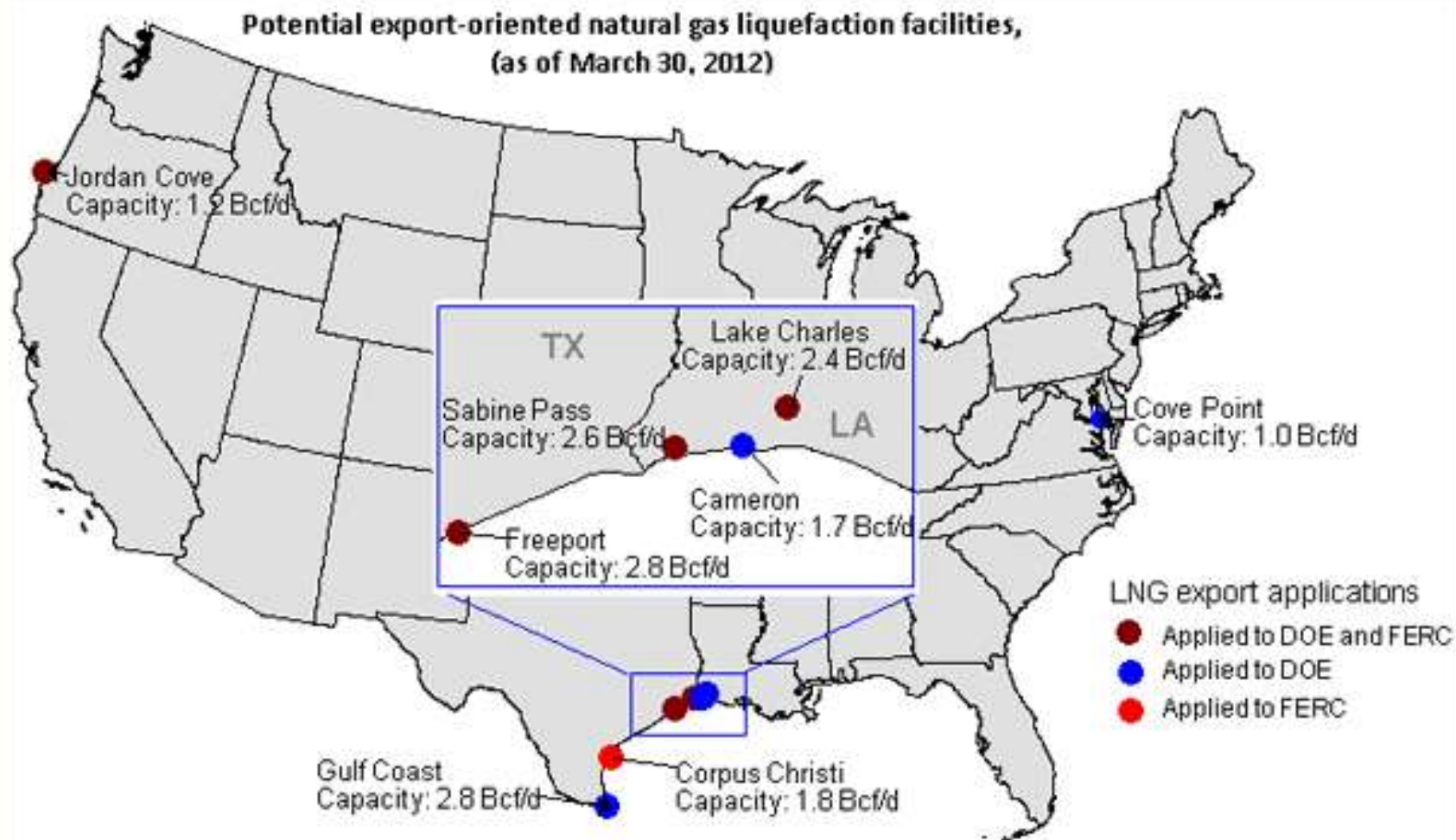
Ports of Kitimat and Prince Rupert are closer to Asia than any other North American port:

- **8 sailing days to Japan**
- **9 sailing days to Korea**
- **11 sailing days to China**

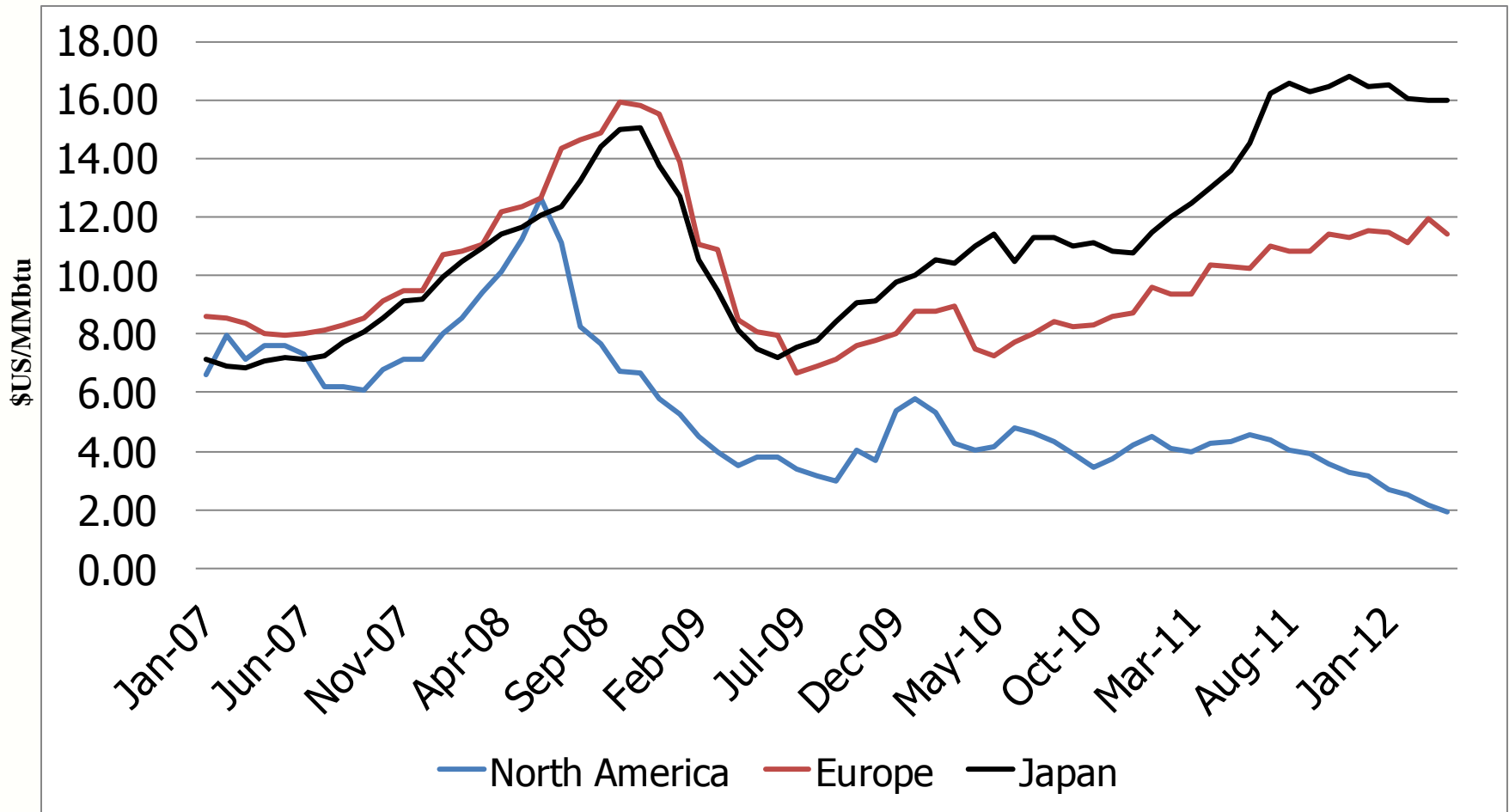
•Canadian LNG Export Project Development:

•Companies	Location	Capacity	Est.	Status
•Apache/EOG/Encana	Bish Cove, Kitimat, BC	1.4 Bcf/d	2015	Awaiting FID
•BC LNG Export Cooperative	Kitimat, BC	0.25 Bcf/d	2013	Awaiting FID
•Shell/China National/Korea Gas	Kitimat, BC	1.8 Bcf/d	-	Advanced
•Progress/Petronas	TBD	1 Bcf/d	2018	Conducting feasibility
•Nexen/Inpex	TBD			Conducting feasibility

Potential U.S. LNG Terminals

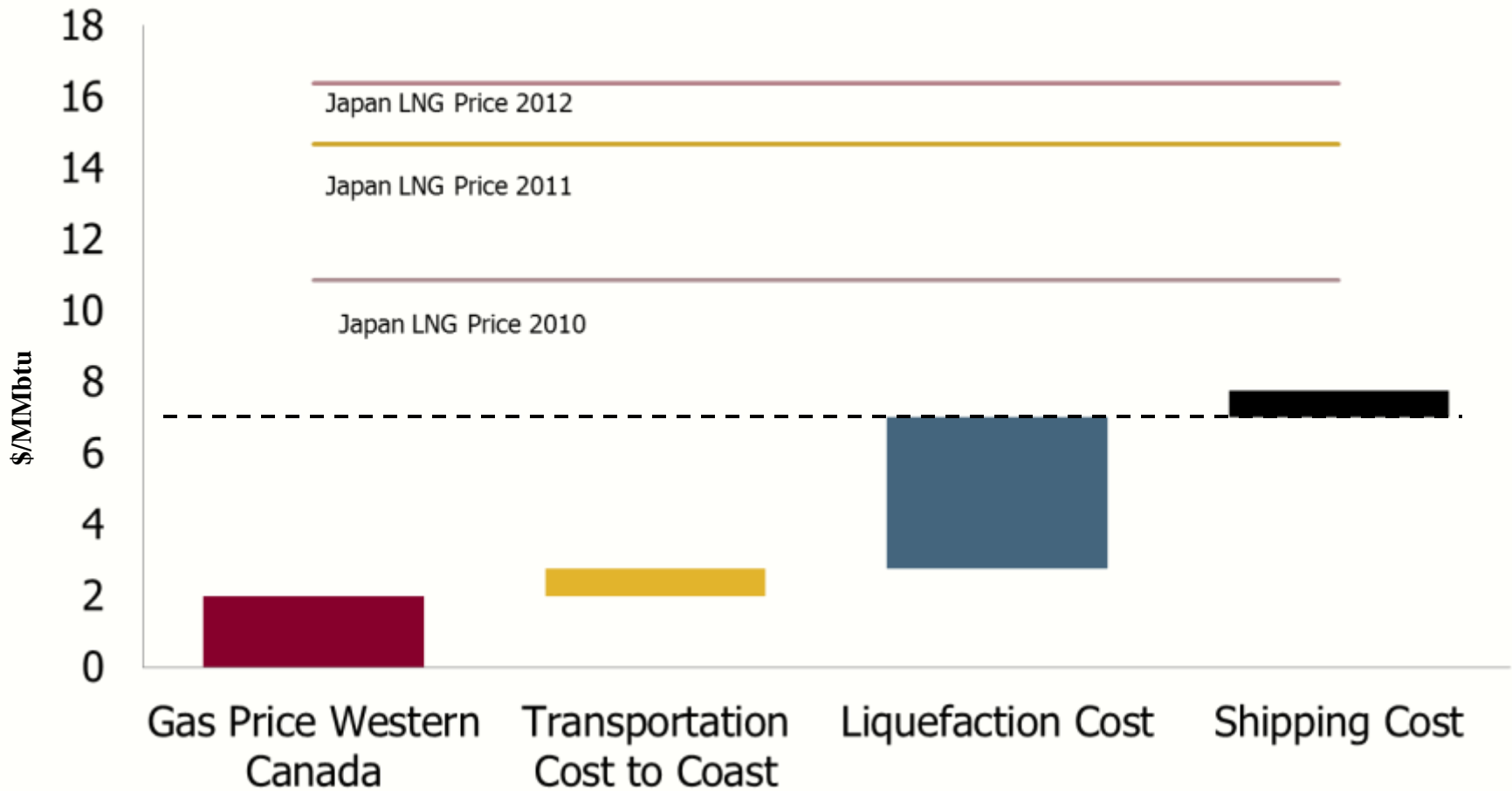


World Natural Gas Prices



Source: World Bank

Favourable Project Economics Associated with Serving Asian Natural Gas Markets

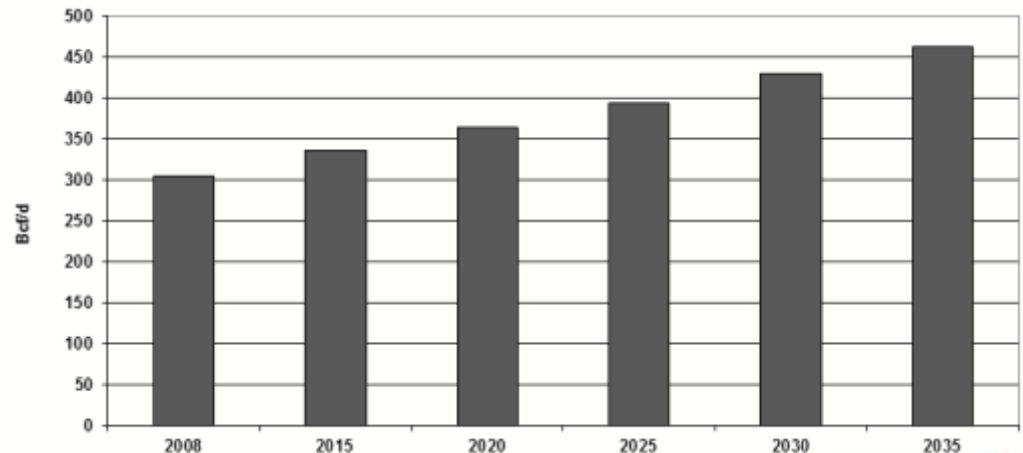


Outlook for LNG Trade

- **LNG trade has almost tripled since 1997**
- **Increases in world wide gas consumption will drive growth in world LNG trade**
- **Currently about 7% of all natural gas produced finds its way into the LNG market**
- **EIA is anticipating that the LNG market will account for an increasing share of world natural gas trade as liquefaction capacity almost doubles over the next two decades**

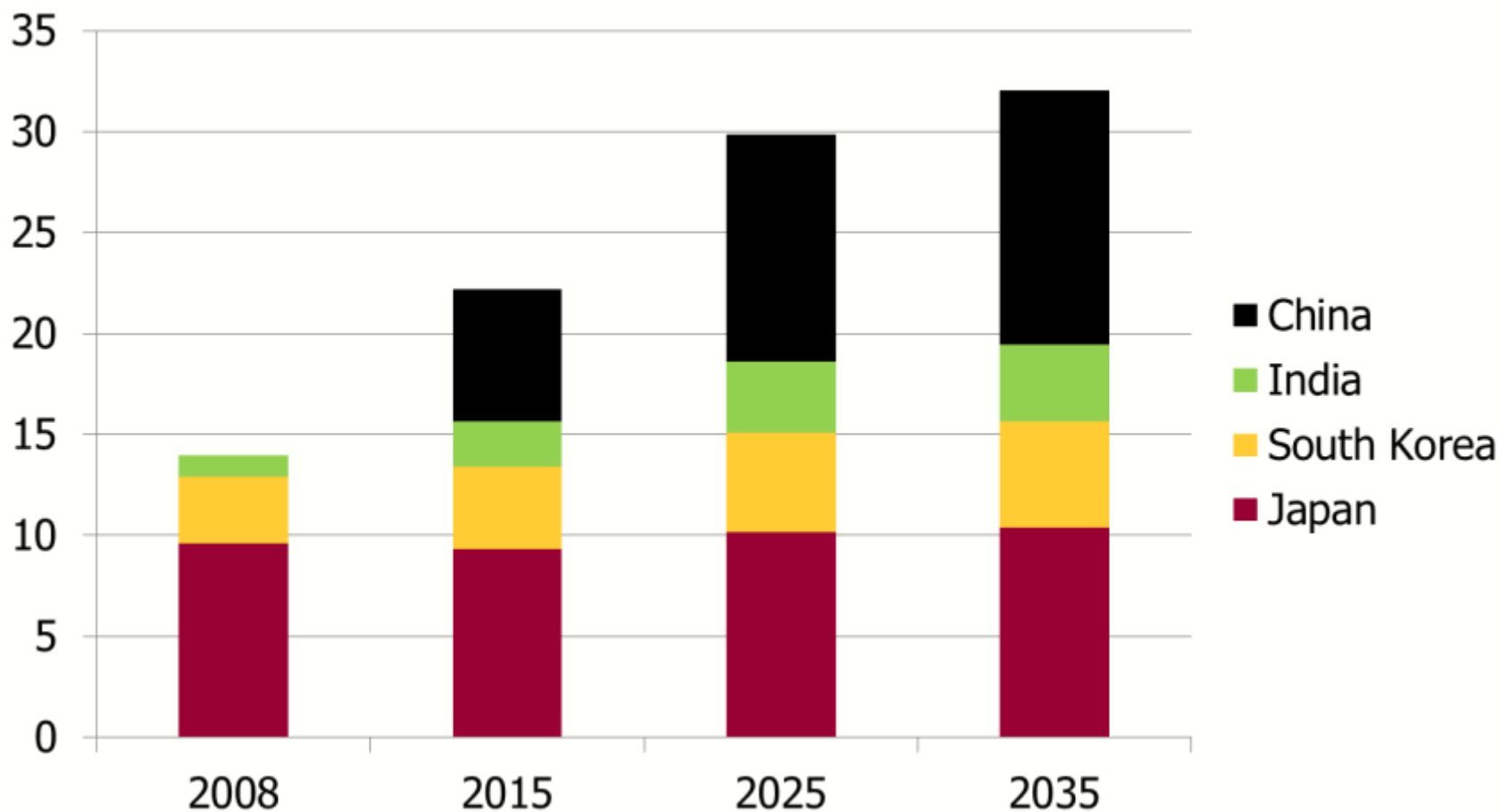


Projected World Natural Gas Consumption



Source: EIA 2011 International Energy Outlook

Projected Net Natural Gas Imports Bcfd



Source: EIA 2011 International Energy Outlook

Australia, A New Global Supplier

Conventional new LNG production in Western Australia

Pluto Project (Woodside/Kansai Electric/Tokyo Gas)	0.55 Bcf/d	2011
Gorgon (Chevron/Exxon Mobil/Shell)	1.92 Bcf/d	2014
Ichthys (INPEX, Total)	1.03 Bcf/d	2016
Wheatstone (Chevron/Apache/Tepco/Kogas)	3.22 Bcf/d	2016
Prelude Floating Liquefied Natural Gas (Shell)	0.70 Bcf/d	2017

Coal Seam-Gas-LNG Eastern Australia

Australia Pacific LNG (ConocoPhillips/Origin)	2.33 Bcf/d	2014
Gladstone LNG (Santos/Petronas/Total/Kogas)	0.82 Bcf/d	2015
Queensland Curtis (BG/CNOOC/Tokyo Gas)	1.64 Bcf/d	2014

- Australia is expected to experience a major increase in natural gas production
- Scarce resources, overheated construction market, labour shortage, and limited number of LNG Engineering, Procurement and Construction contracts may result in cancellation or delay in some projects
- Conventional LNG will compete with Coal seam gas-to-LNG.

Consumers Benefit from Shale Gas Production

Canada:

Recent article in Globe & Mail on shale gas states:

- *"...the slump in natural gas prices since 2008 has shaved more than \$11.8 billion off Canada's annual fuel bill, figures from Statistics Canada show."*
- *"And in Ontario and Quebec, which account for 40 per cent of Canada's gas demand, consumers paid \$4.5 billion less for their gas last year than in 2008."*

United States:

Consumers saved \$83.9 billion in 2011 compared to 2008.

Average natural gas price by user and total spending, 2008 vs. 2011

User	Avg. Price 2008	Spending 2008 (B)	Avg. Price 2011	Spending 2011 (B)	Savings 2011 vs. 2008 (B)
Residential	\$13.89	\$67.95	\$11.39	\$51.12	\$16.83
Commercial	\$12.23	\$38.56	\$9.47	\$28.02	\$10.54
Industrial	\$9.65	\$64.37	\$5.49	\$33.98	\$30.38
Electric Power	\$9.65	\$64.35	\$5.49	\$38.16	\$26.19
	Total, 2008	\$235.23B	Total, 2011	\$151.29B	\$83.94B

Note: Prices are per 1,000 cubic feet.

Shale Gas Development – Economic Impact on U.S. Economy

- **Jobs:**

- Will grow from 600,000 in 2010 to 870,000 in 2015.

- **Contribution to GDP:**

- More than \$76 billion in 2010. Will increase to \$118 billion in 2015, and triple to \$231 by 2035.

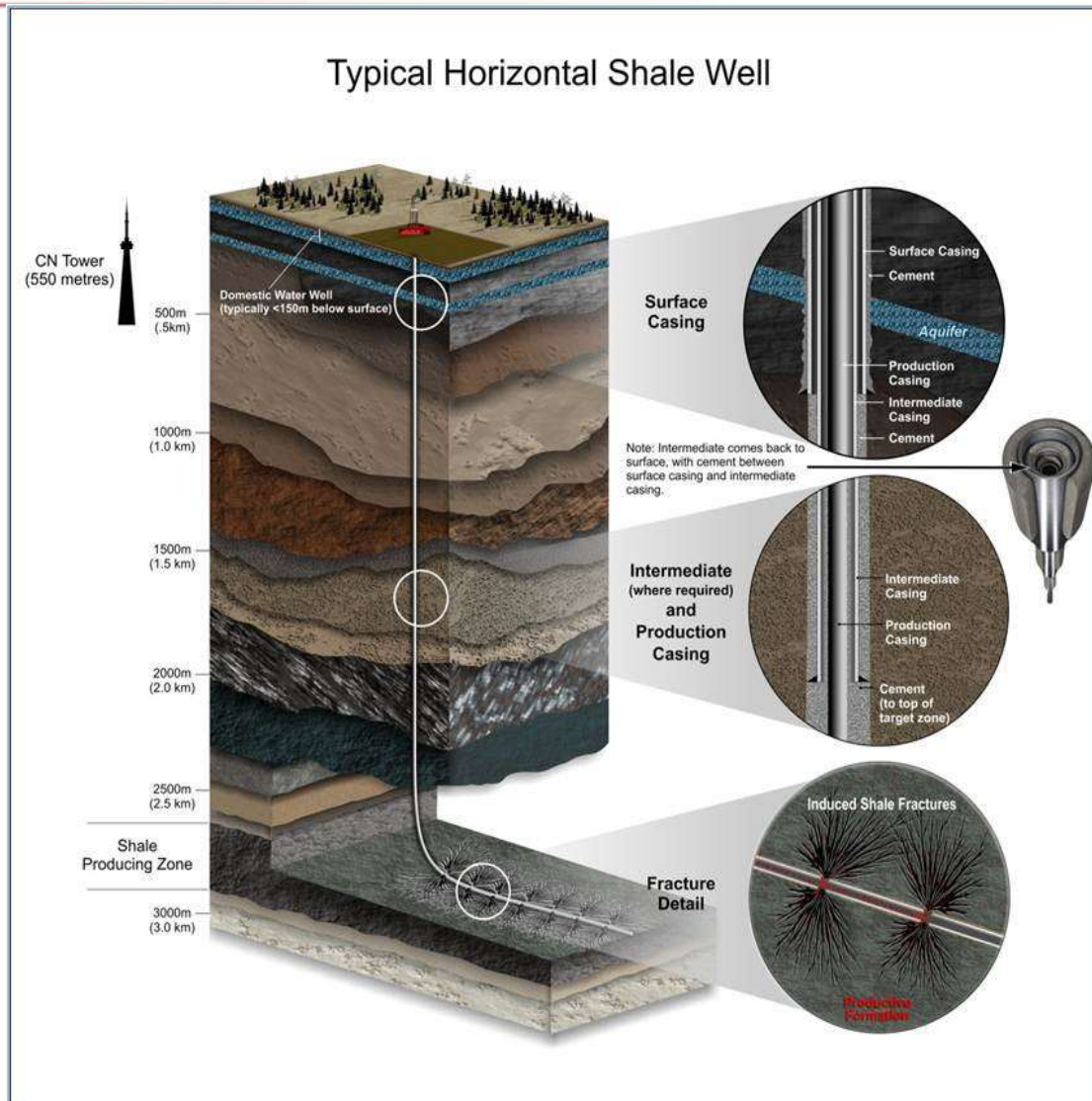
- **Government taxes & royalties:**

- \$18.6 billion in 2010 growing to \$57 billion in 2035

Source: IHS Global Insight



Fracking Technology



CAPP Guiding Principles for Hydraulic Fracturing

1

We will safeguard the quality and quantity of regional surface and groundwater resources, through sound wellbore construction practices, sourcing fresh water alternatives where appropriate, and recycling water for reuses as much as practical.

2

We will measure and disclosure our water use with the goal of continuing to reduce our effect on the environment

3

We will support the development of fracturing fluid additives with the least environmental risks.

4

We will support the disclosure of fracturing fluid disclosure.

5

We will continue to advance, collaborate on and communicate technologies and best practices that reduce the potential environmental risks of hydraulic fracturing.

Natural Gas - Environment

Natural Gas generates half as much carbon dioxide as coal to produce the same amount of electricity

- **Carbon dioxide:**
 - Natural gas – 1135 lbs/MWh
 - Coal – 2,249 lbs/MWh
- **Sulphur dioxide:**
 - Natural gas – 0.1 lbs/MWh
 - Coal – 13 lbs/MWh
- **Nitrogen oxides:**
 - Natural gas – 1.7 lbs/MWh
 - Coal – 6 lbs/MWh
- **Shale gas emits 3.8% more GHG than weighted average WCSB gas production on a life cycle basis**

Source: U.S. EPA & NRCan



CAPP Communications Focus

• Advertising - print and TV

- Raise awareness, promote positive attributes
- Promote broader user
- Highlight economic benefits
- Provide a cleaner energy choice for Asian markets
- Target print advertising for producing areas – focus on safe and responsible shale gas development

• Engagement and Outreach

- Natural Gas Dialogues across Canada
- Community engagement
- Outreach via web and social media

• Media Relations

- Continue with rapid-response
- Media tours

• Lower Profile Upstream Effort

- On fracking in operating areas

FORECAST: Canada will earn more than \$350 billion* in natural gas royalties and taxes. Turns out, cleaner-burning natural gas can fuel all kinds of good things.

Health Care
Social Services
Education

Natural gas is the largest energy source for Canadian homes and businesses, and is the most sought-after. And over the next 25 years, natural gas will provide governments across Canada with more than \$200 billion* in royalties and taxes. These revenues can help pay for valuable services like health care, social services and education for all Canadians. Discover the possibilities at canadiannaturalgas.ca

Canadian Natural Gas
Tomorrow's energy. Ready today.

Switching heavy-duty fleets to natural gas reduces emissions. By the truck load.

Heavy-duty trucks and buses running on natural gas can reduce greenhouse emissions by up to 25%, and reduce their fuel costs too. Discover more for trucking & transit. Abundant, affordable clean energy is natural gas. Discover the possibilities at canadiannaturalgas.ca

Canadian Natural Gas
Tomorrow's energy. Ready today.

Natural gas is used to:

- Heat homes and businesses
- Power industry
- Generate electricity
- Fuel vehicles
- Prepare tourtière
- All of the above

How much cleaner-burning natural gas? The natural gas used to heat homes, power industry and generate electricity is cleaner than any other energy source. Burning more (and it's used to power Canadian homes and power more Canadian industry than any other energy source). Burning more (and it's used to power Canadian homes and power more Canadian industry than any other energy source). Burning more (and it's used to power Canadian homes and power more Canadian industry than any other energy source). Burning more (and it's used to power Canadian homes and power more Canadian industry than any other energy source).

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Tomorrow's energy. Ready today.

C  **PP** **RESPONSIBLE**
CANADIAN ENERGY™