OIL & GAS IN NORTH AMERICA:
Recent Changes and their Geopolitical Consequences

Canada: A Resource Economy & its Discontents

Centre for International Studies PROMEC
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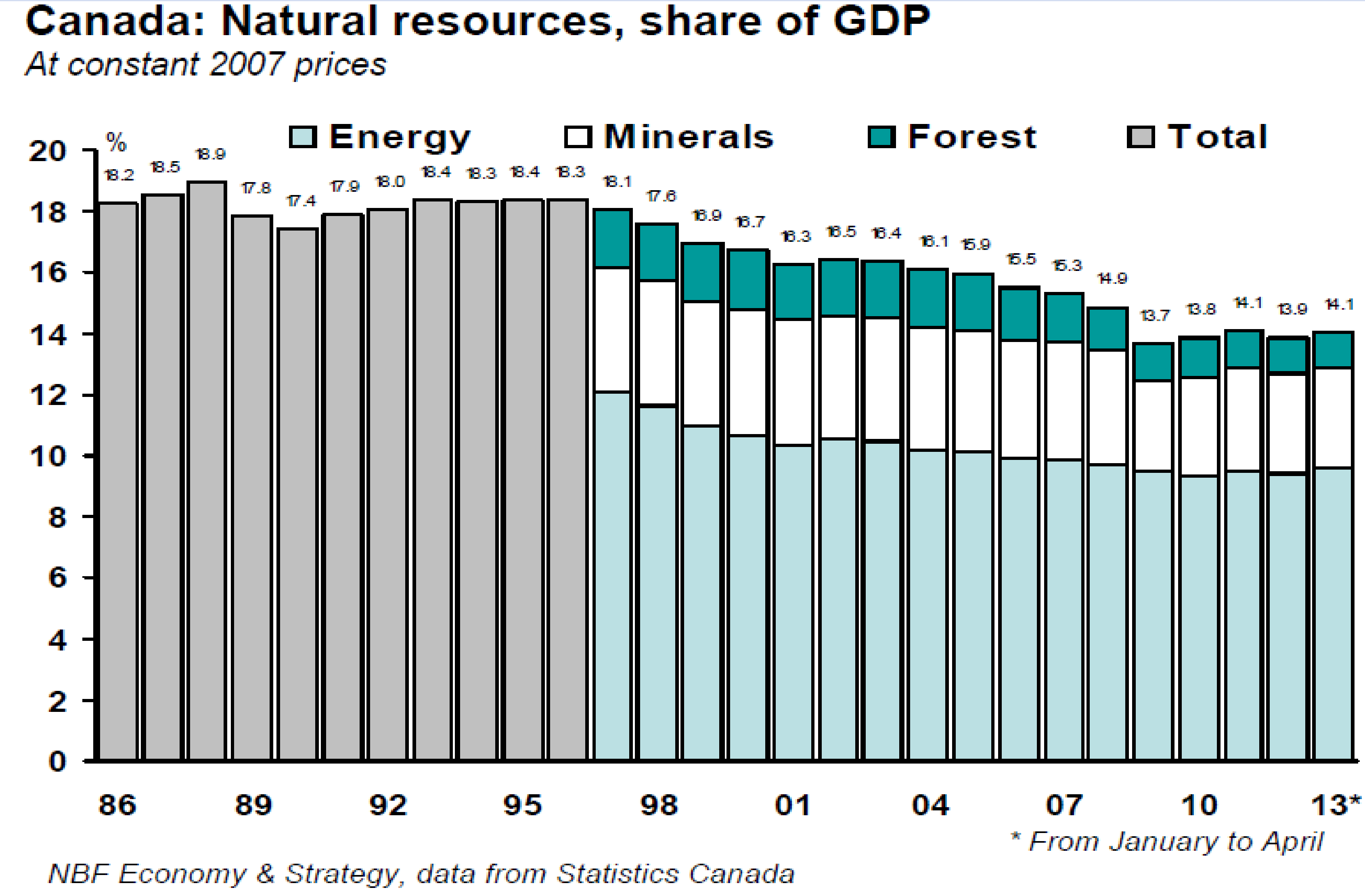
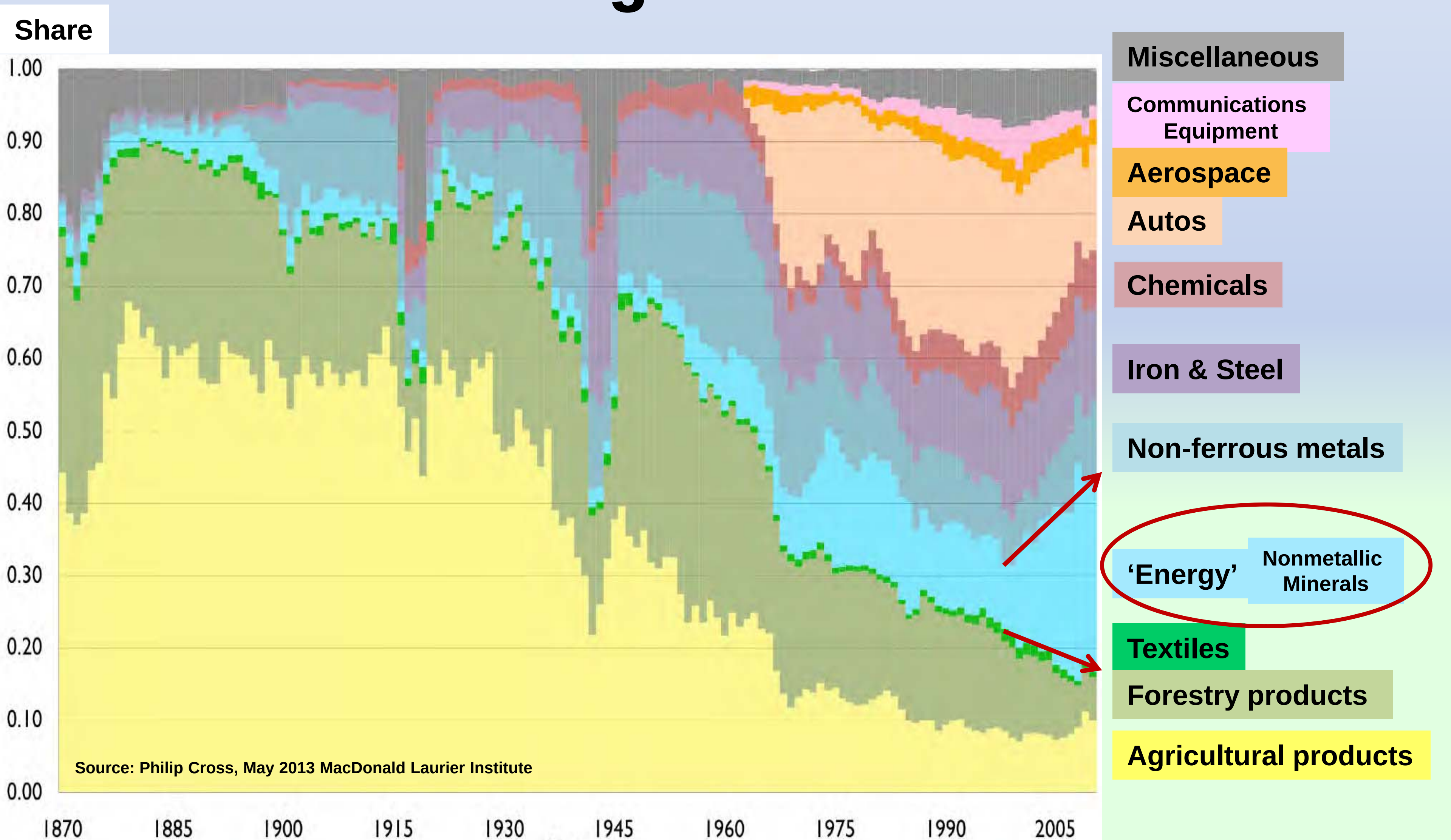
Outline

- Canada's oil & gas—economic and global context
- Developments, Issues & Discontents
- Canada – US energy relations: 'an on-and-off affair'

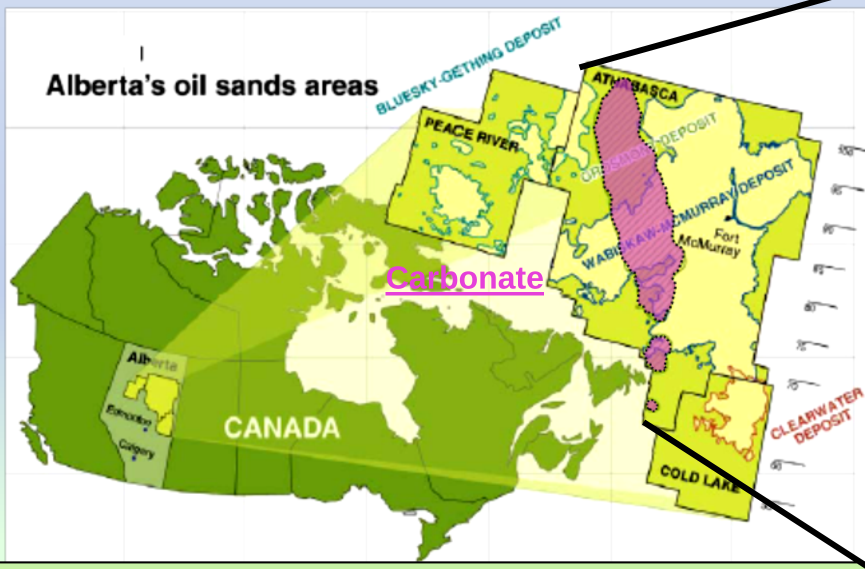
Natural resources share of Canada's GDP declining but Energy's share increasing



Canada's Export Shares
1870 - 2010
Increasing diversification



The Oil Sands: Resources & Reserves



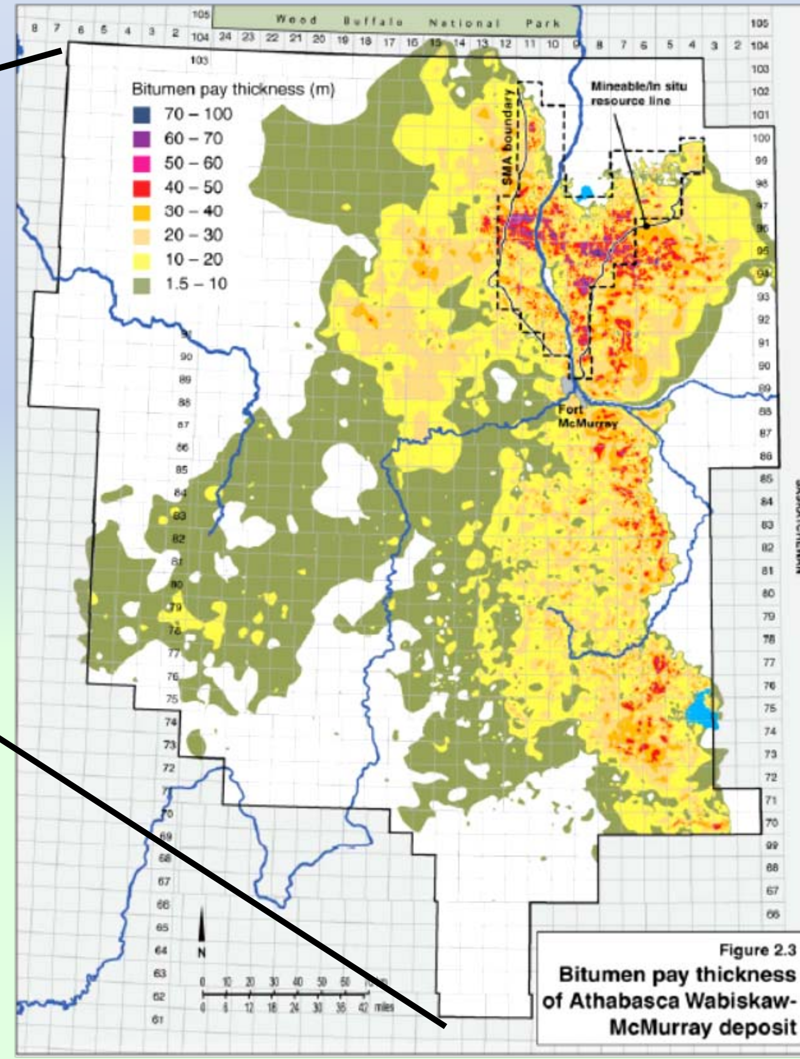


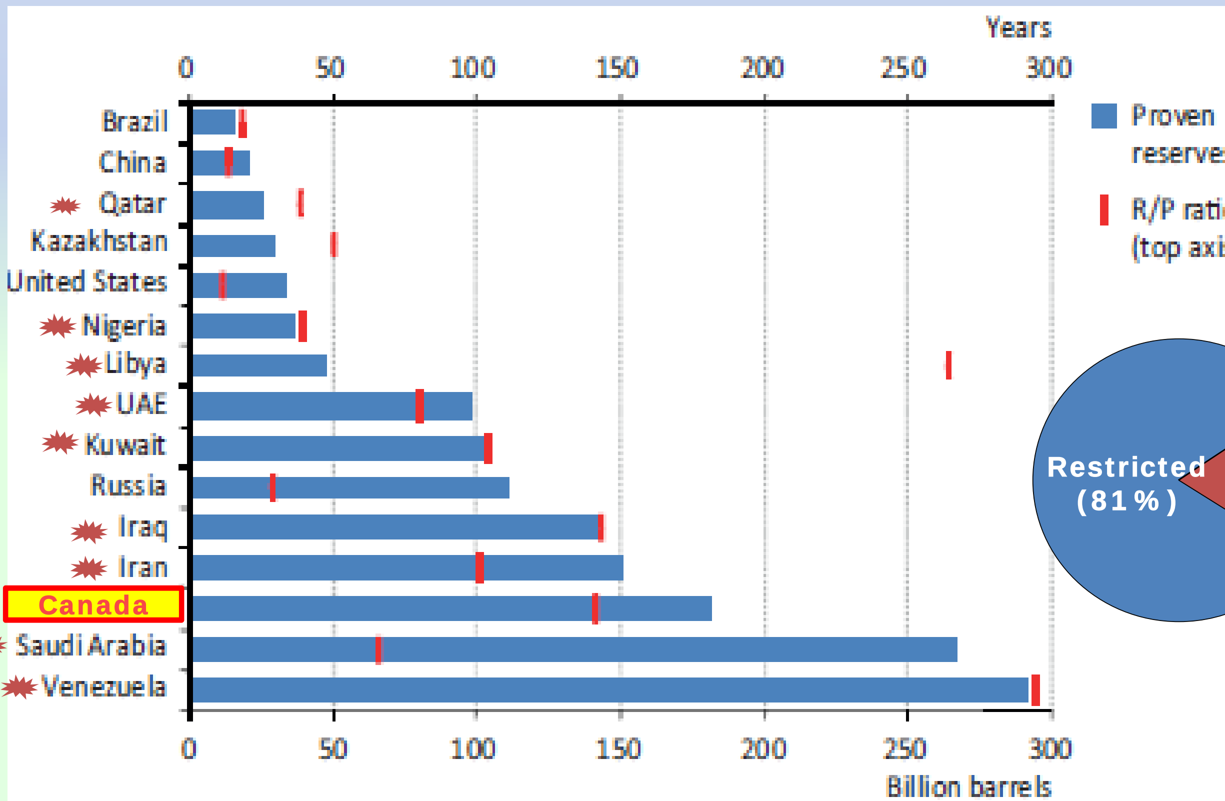
Figure 2.3
Bitumen pay thickness of Athabasca Wabiskaw-McMurray deposit

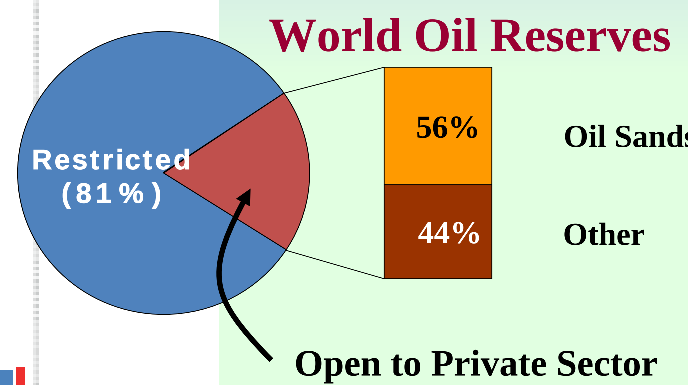
Total initial volume in place	1,846 G bbls
Mineable bitumen (Athabasca)	131
Amenable to *in situ* techniques	
Athabasca	888
Cold Lake	183
Peace River	136
Grosmont - Nisku Carbonate	508
Remaining Reserves	**169 G bbls**

Source: AER (ERCB) ST98 2013

Canada's Oil Sands in Global Oil Context

- ~168 billion barrels of bitumen reserves in the oil sands
  ~~> 10% of bitumen resource in place
- >8 billion barrels recovered to date (60:40 mining : *in situ*)
- Current production ~2.0 mmb/d ~ 50:50 mining : *in situ*
- The 15 countries listed below represent >90% of the world's oil reserves

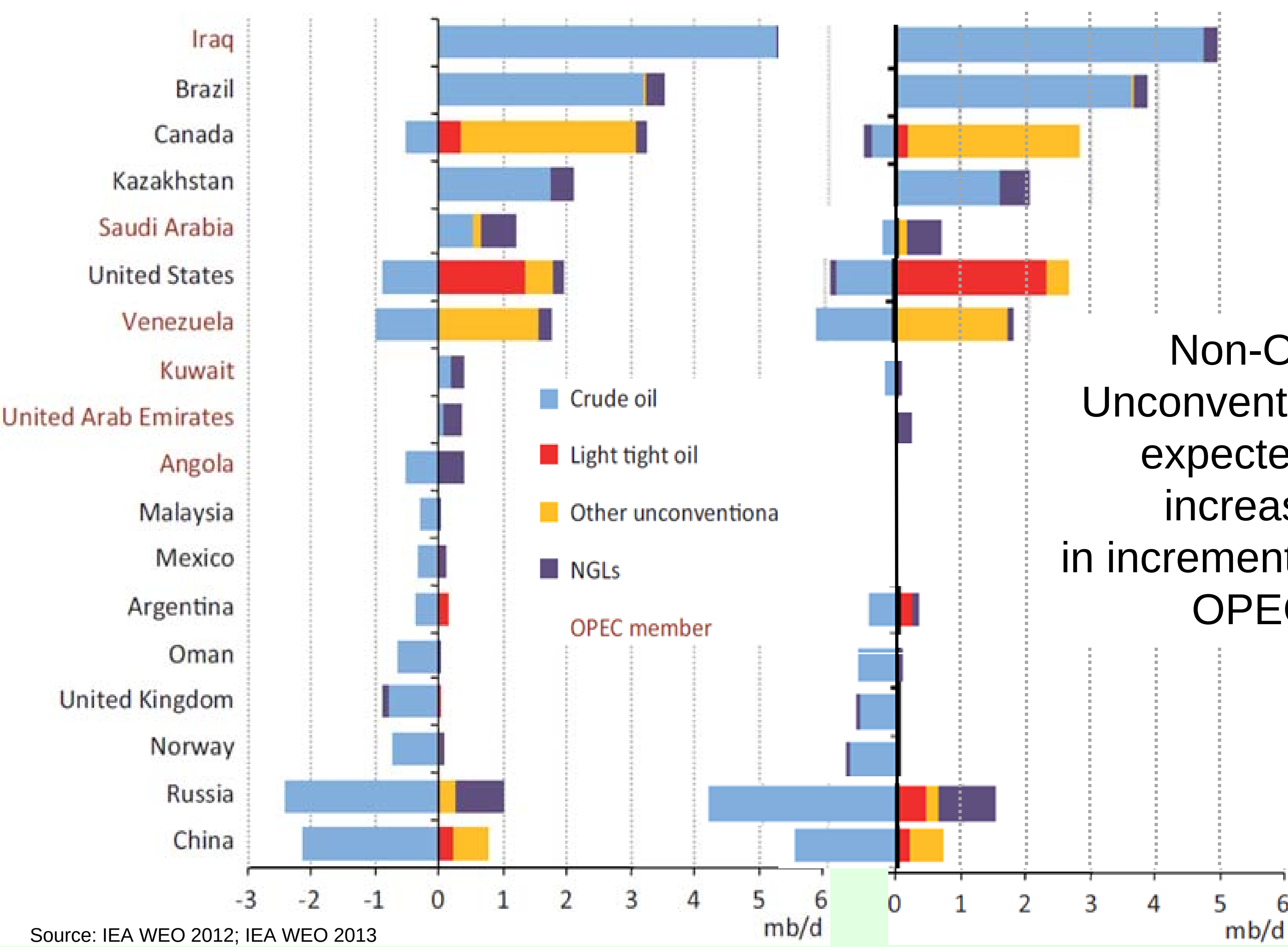




Source: IEA WEO 2012 based on Oil & Gas Journal and BP Statistical Review 2012; CAPP

Oil production changes 2011-2035

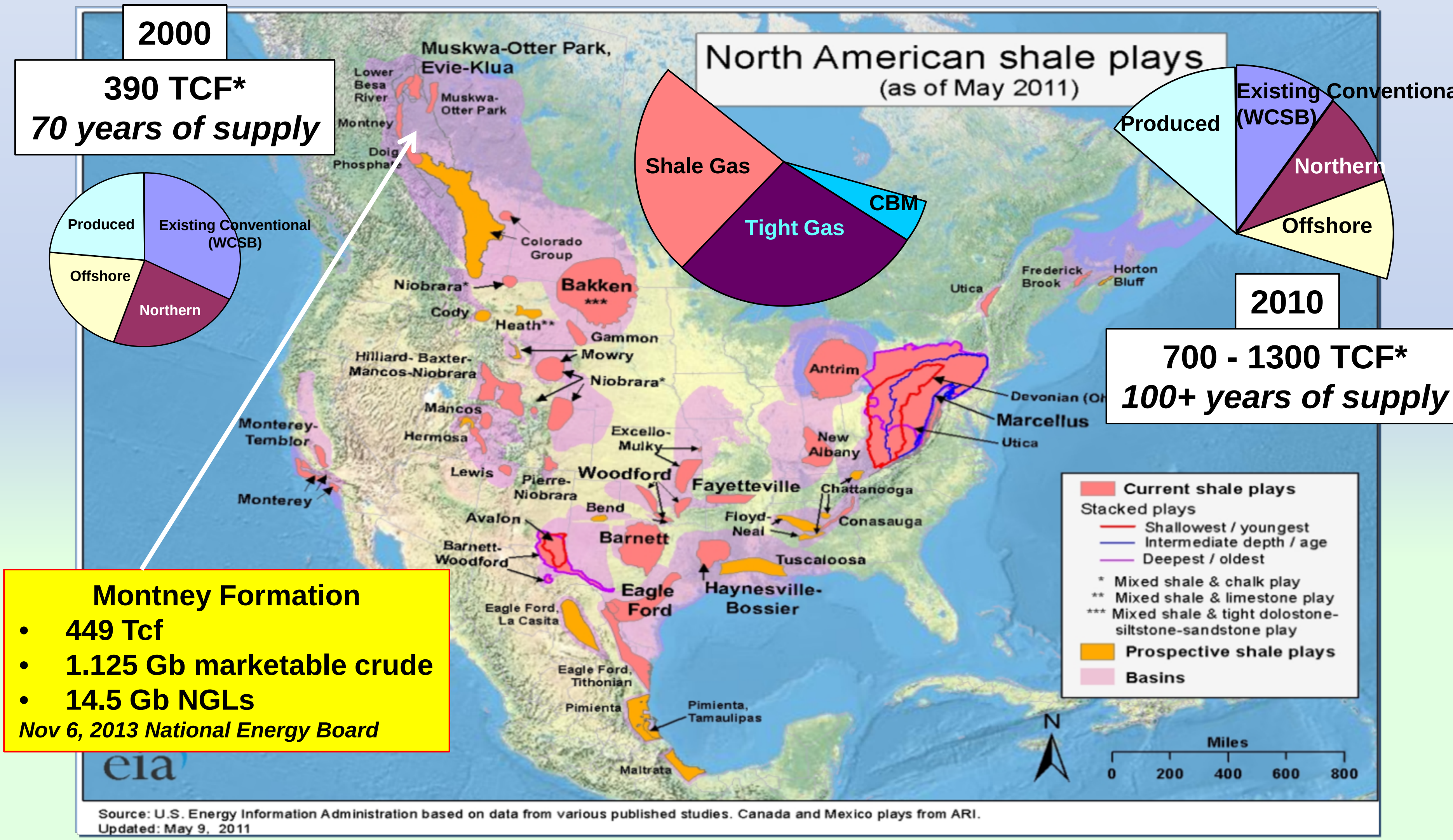
WEO 2012 (2011-2035) | WEO 2013 (2012-2035)



Non-OPEC & Unconventional liquids expected to play increasing roll in incremental oil supply; OPEC less

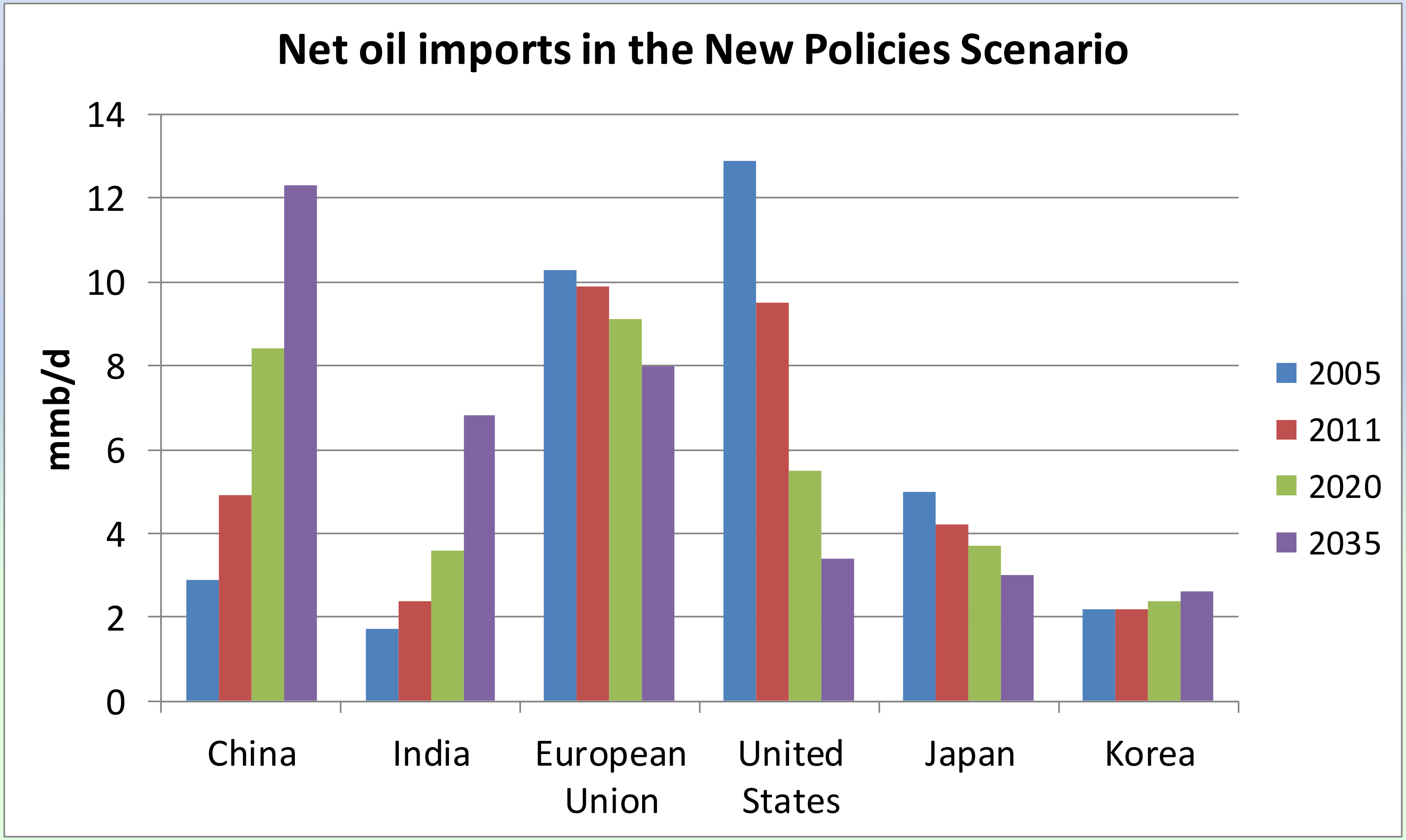
Source: IEA WEO 2012; IEA WEO 2013

Canada's gas resources have increased (2000 – 2010)



*Estimated Recoverable Marketable Gas; Source, CAPP after GSC, NEB & others

Changing Global Oil Import Needs



Source: IEA World Energy Outlook 2012, EIA

Photo: CBC

Photo: CTV News

6 months of unconventional hydrocarbons in Canada (2013)

Photo: Huffington Post

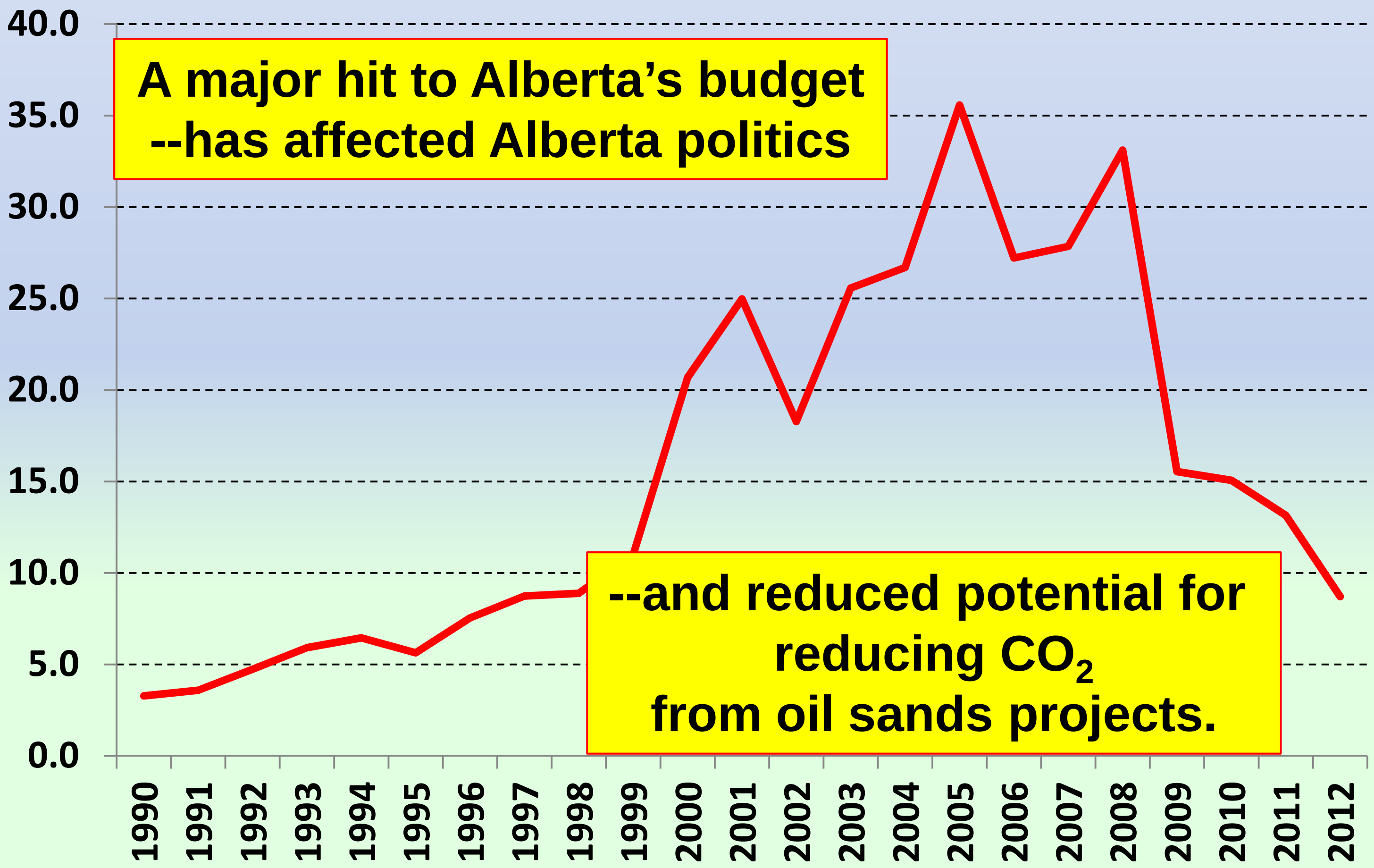
Photo: Global News

The Issues

- A resource economy whose elites tend to oppose resource development
- Canada's oil & gas: high cost in a softening and competitive market
- Aboriginals ('First Nations') can stop resource development
- Natural Gas: Revenues down; west → east flows declining, US shale gas moving into central Canada market
- Industry: Access to capital (for some), labor & markets
- Market diversification but opposition inside & outside Canada, in particular in traditional US market

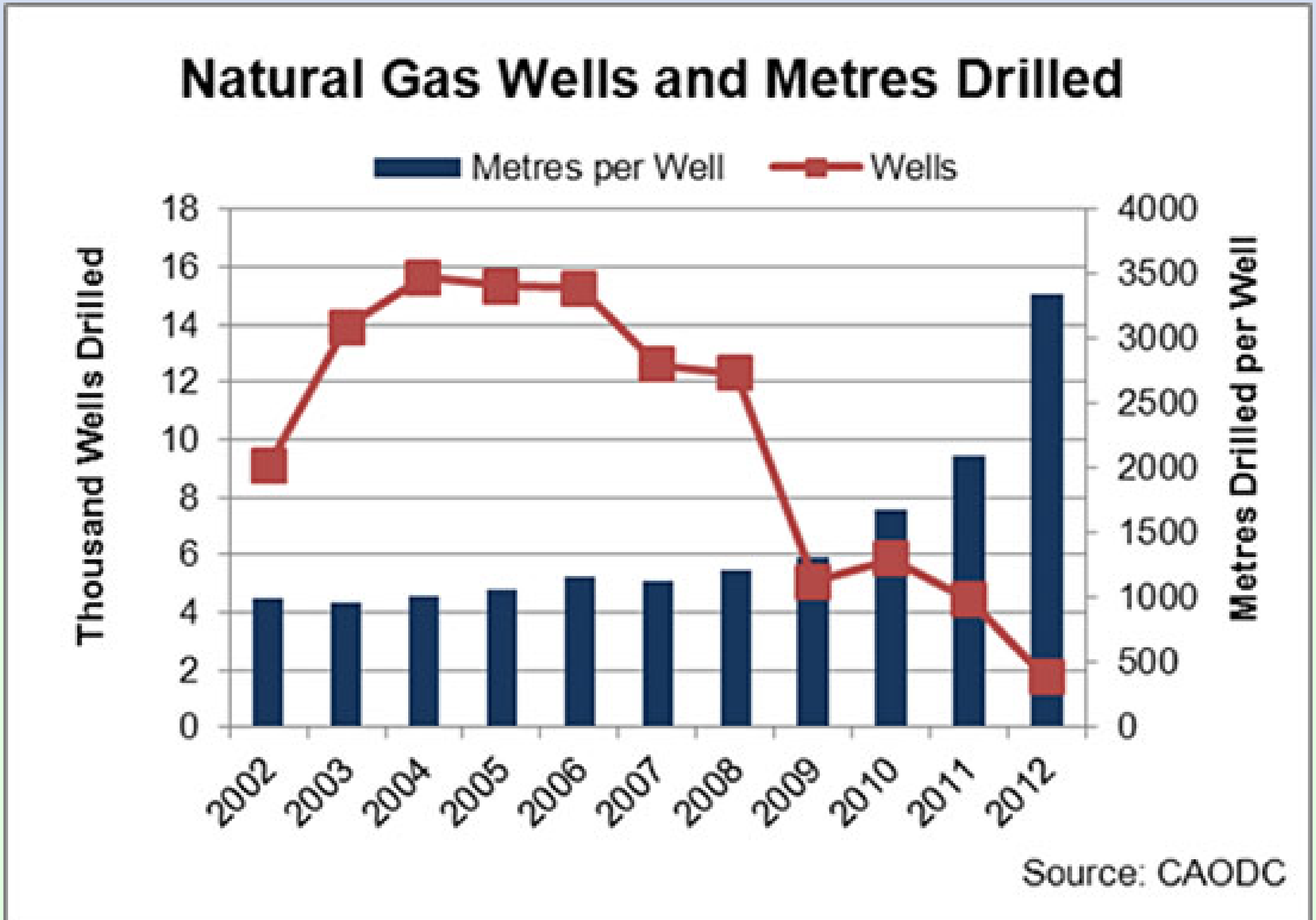
Value of Natural gas exports

(1990 → 2012 $CAD Billion/year)



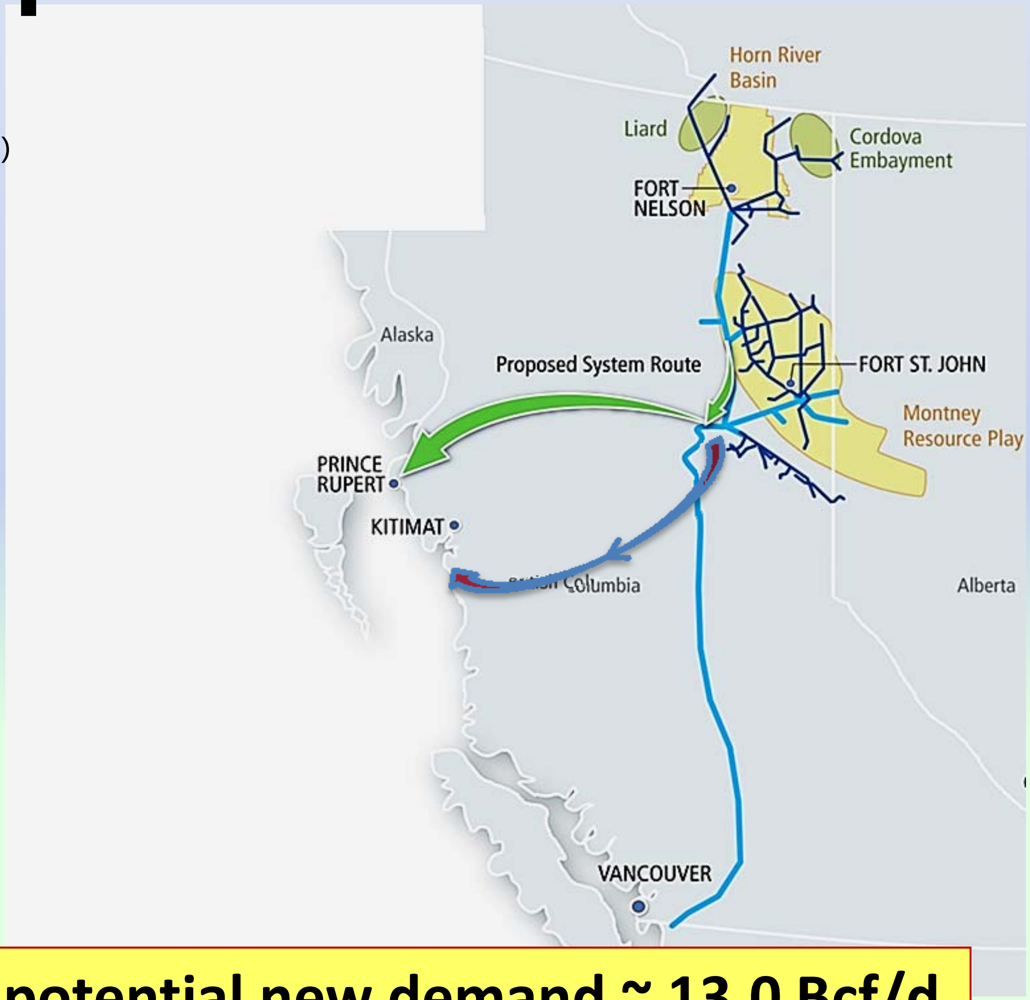
Source: National Energy Board (2013)

Drilling industry impacted



Canadian LNG export projects proposed

- **Kitimat LNG** (Chevron, Apache)
  - 1.4 Bcf/d
  - Permits received; awaiting investment decision
- **Douglas Channel LNG** (BC LNG Export Co-operative)
  - 0.125 Bcf/d
  - Permits received
- **LNG Canada** (Shell, KOGAS, Mitsubishi, PetroChina)
  - 2.0 – 3.2 Bcf/d
  - Feasibility stage; applied for some permits
- **Pacific Northwest LNG** (Progress/Petronas, Japex)
  - 2.0 Bcf/d (Merger approval granted)
  - Completed feasibility, progressing to pre-FEED
- **Nexen / Inpex**
  - Conducting feasibility
- **Prince Rupert LNG** (BG Group)
  - 3.0 Bcf/d
  - Advancing feasibility, applying for permits
- **AltaGas / Idemitsu Kosan**
  - 0.27 Bcf/d
  - Conducting feasibility
- **ExxonMobil / Imperial Oil** (WCC LNG Ltd)
  - 4.0 Bcf/d
  - Applied for export licence
- **Woodfibre LNG**
  - 0.3 Bcfd
  - Applied for export licence



Total potential new demand ~ 13.0 Bcf/d

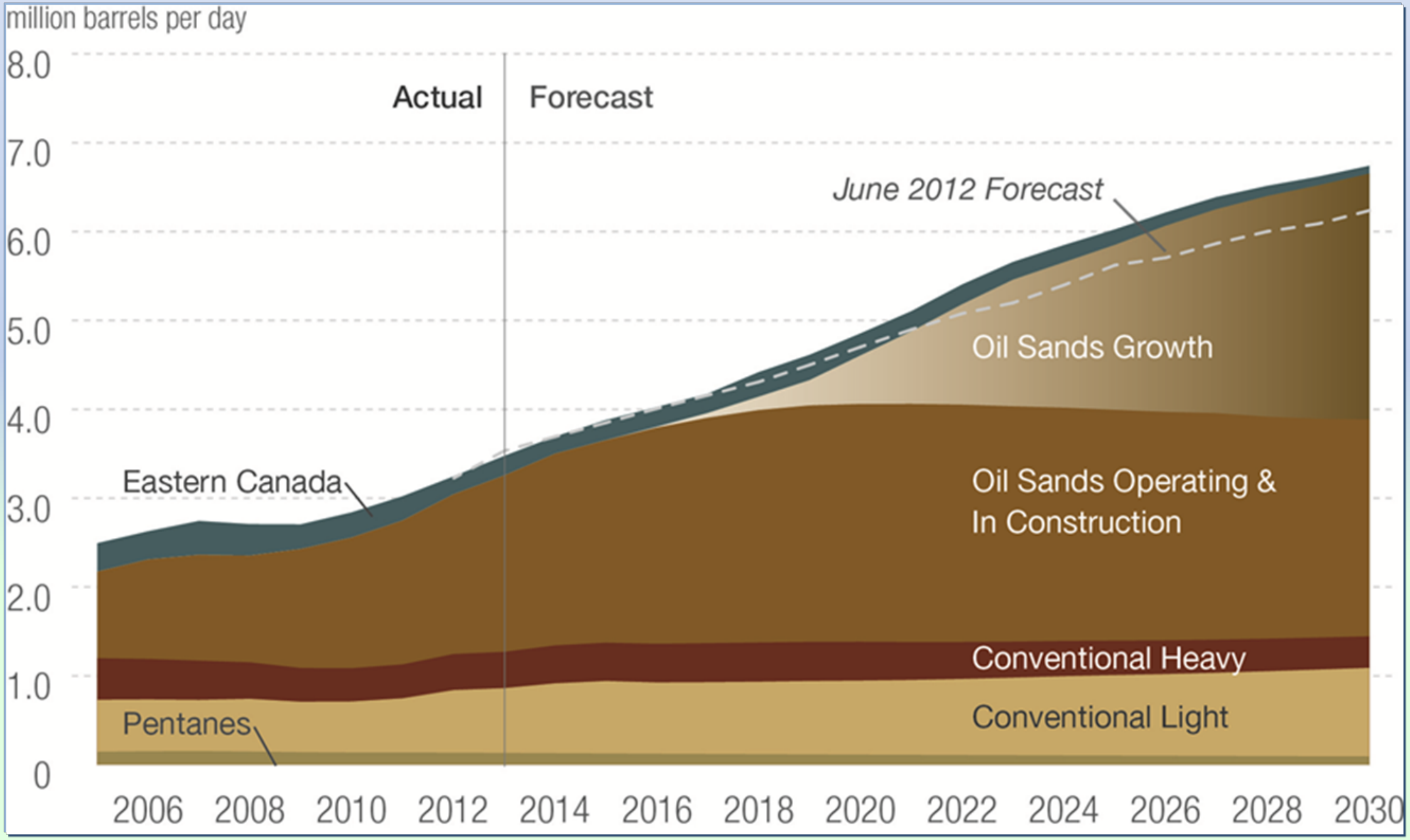
Expressions of interest to proceed with a project have also been made by; Woodside Petroleum & South Korea E&S

BC LNG: Not as simple as it might seem…

High gas supply cost

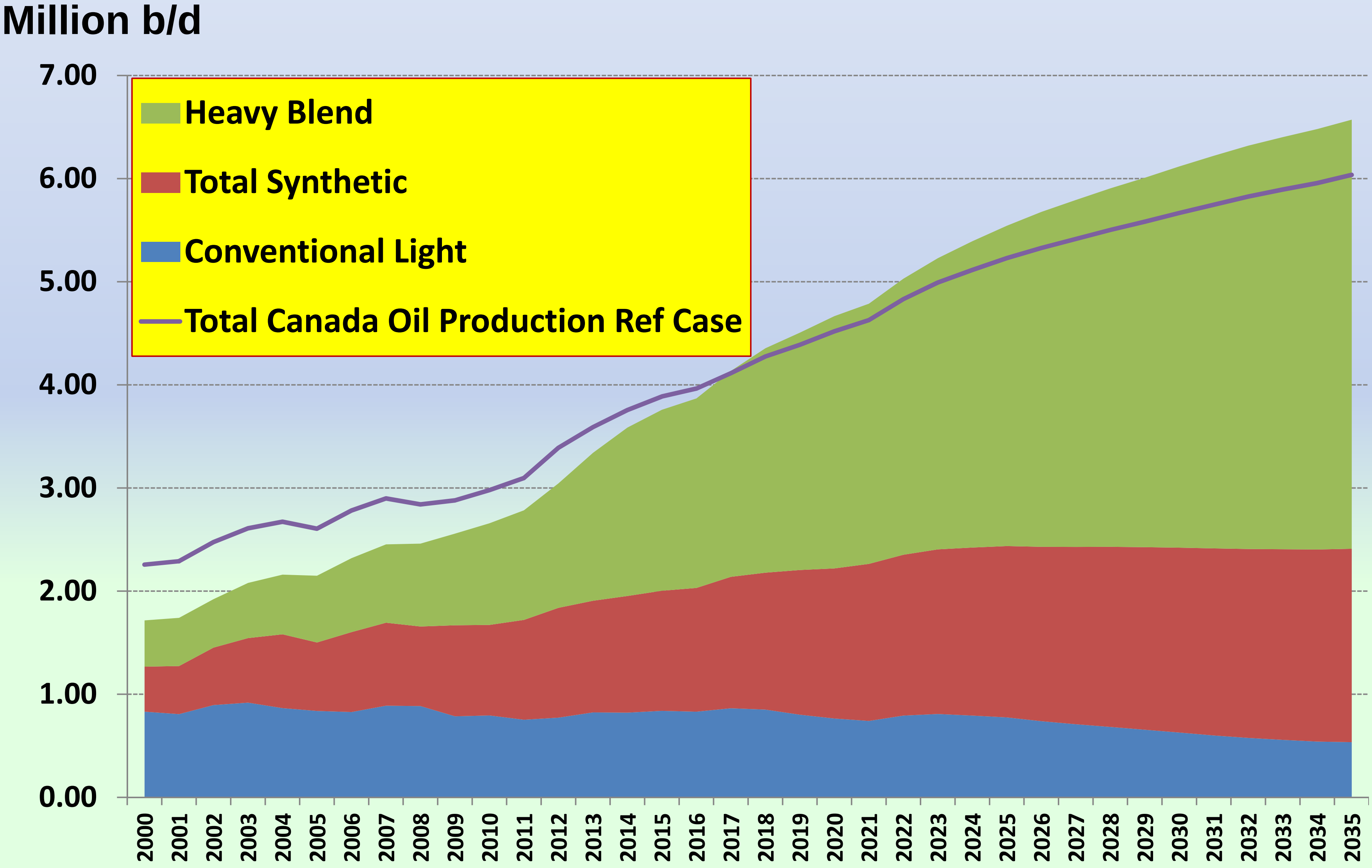
- 10s of 1000s of HF wells over decades in remote NE corner of province,
- New infrastructure to Greenfield coastal/fjord sites
- Labor supply for several concurrent large industrial projects
- Local people involvement critical to success
- BC Gov't rents still uncertain
- CO_2 emissions
- 'Window of opportunity'? Others competing for same market
- Price arbitrage?

Canadian Oil Sands (Bitumen and SCO) & Conventional Production



Source: CAPP 2013 Crude Oil Forecast

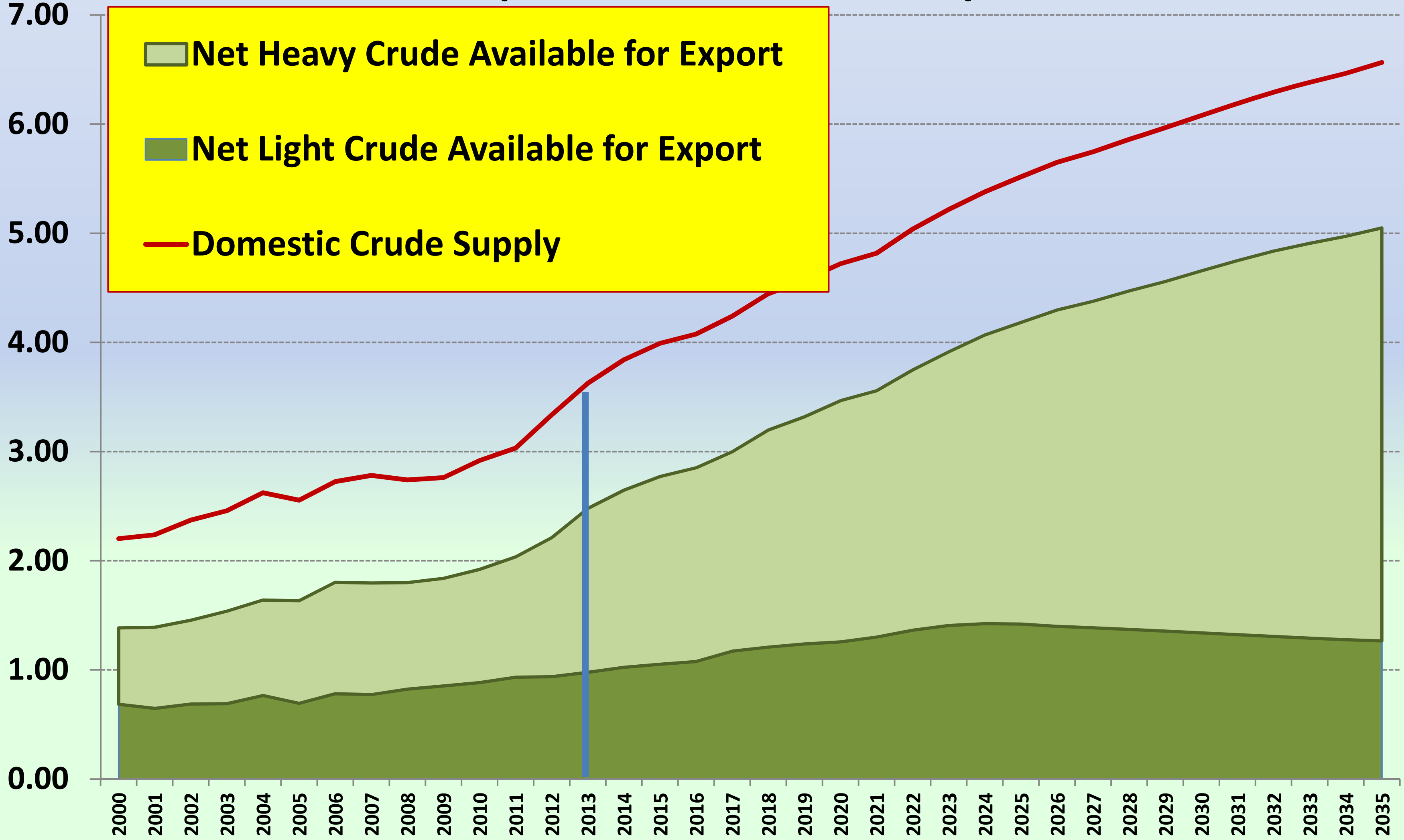
Canada Oil Production Outlook



Source: Canada's Energy Future: Energy Supply & Demand projects to 2035 – Energy Market Assessment NEB (2011)

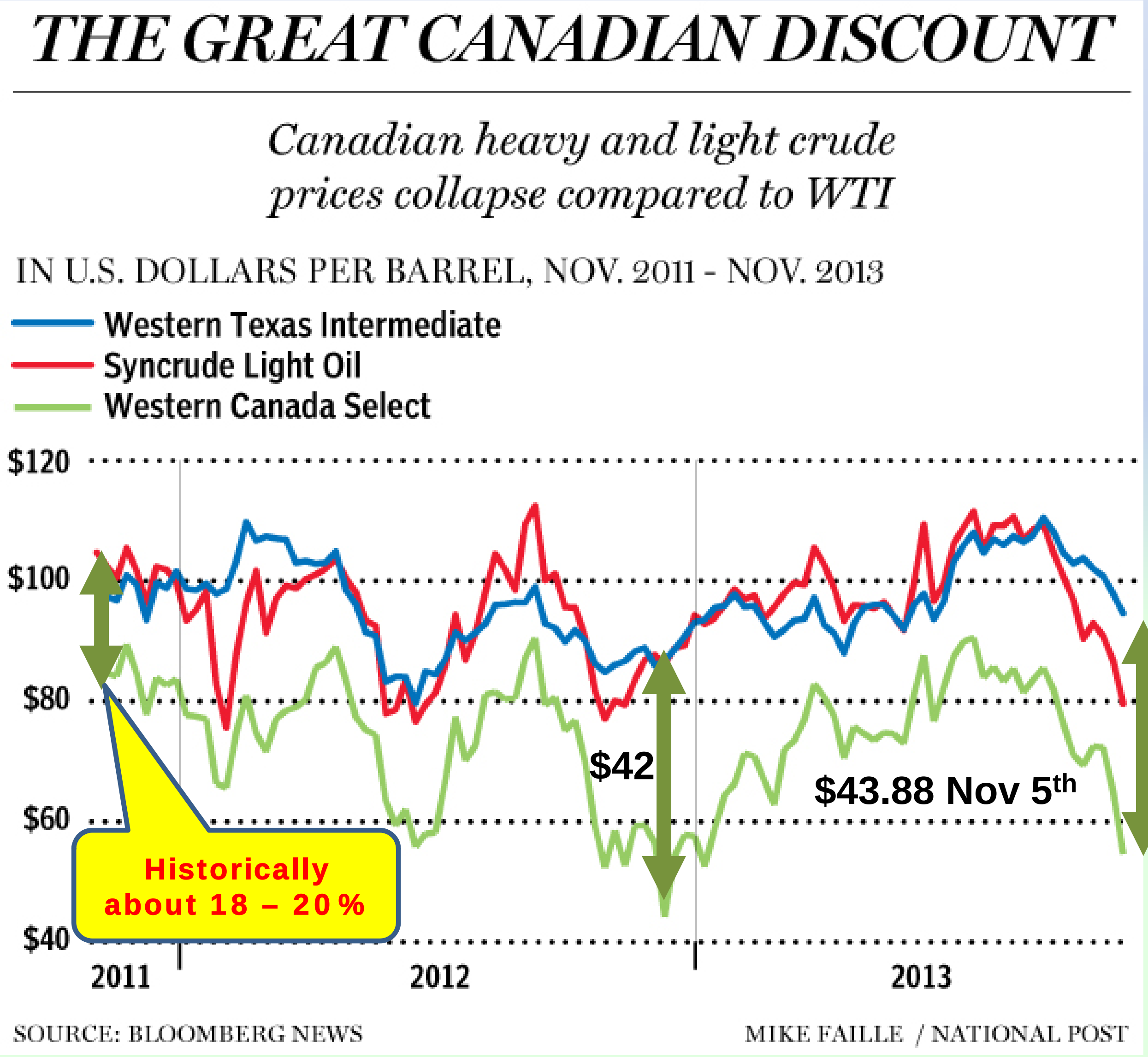
Projected Canadian crude exports

(2000 → 2035 mmb/d)



Source: Canada's Energy Future: Energy Supply & Demand projects to 2035 – Energy Market Assessment NEB (2011)

The ‘Bitumen Bubble’

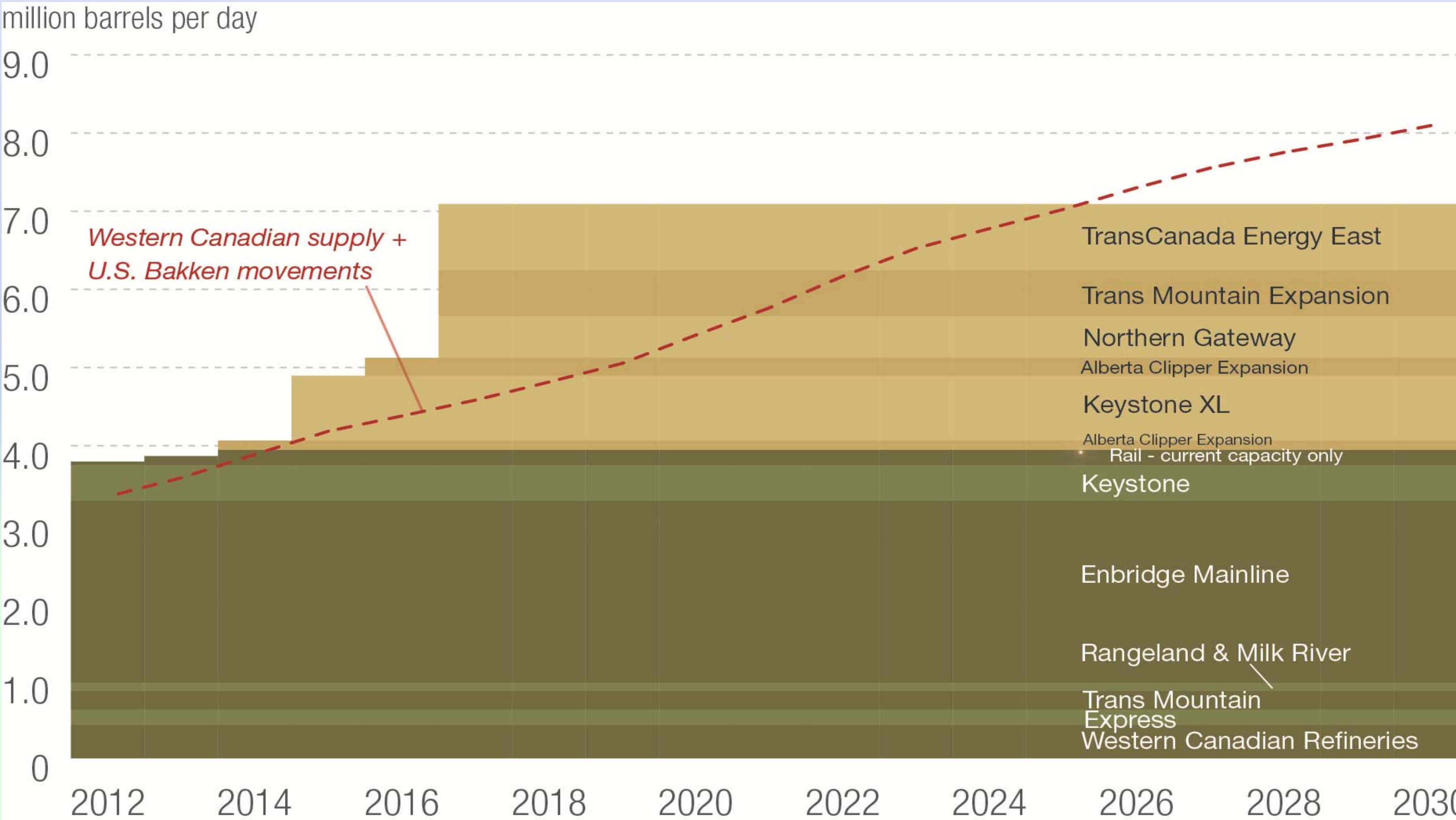


- Pipeline bottlenecks
- Refineries down
- Waiting on cokers
- Oil sands projects ramping up

Chicago ($Cdn)	
Brent	$ 116.19
WTI	$ 105.40
CDN Par	$ 98.04
CDN Heavy	$ 82.78

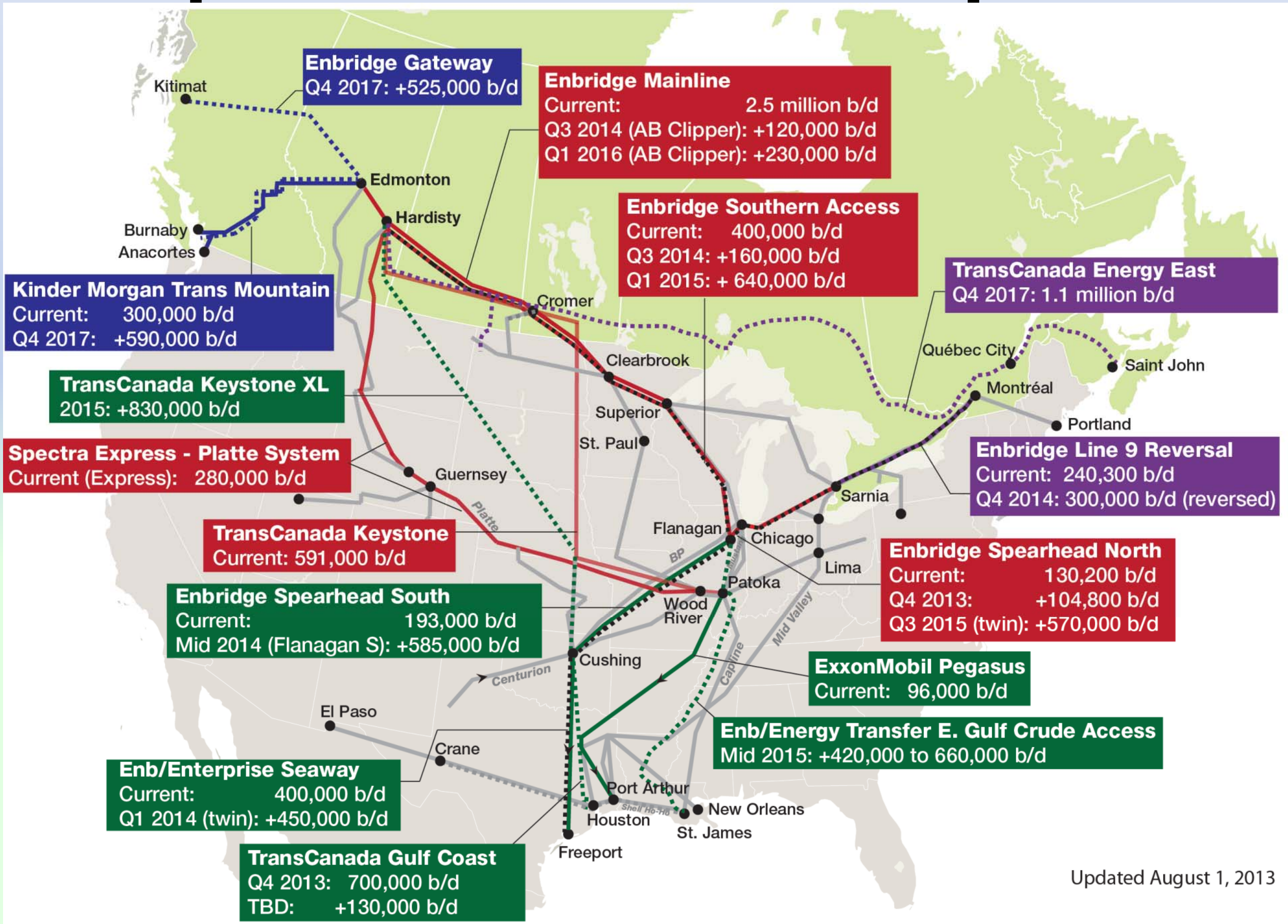
Average prices Oct 2013

WCSB Takeaway vs Supply Forecast

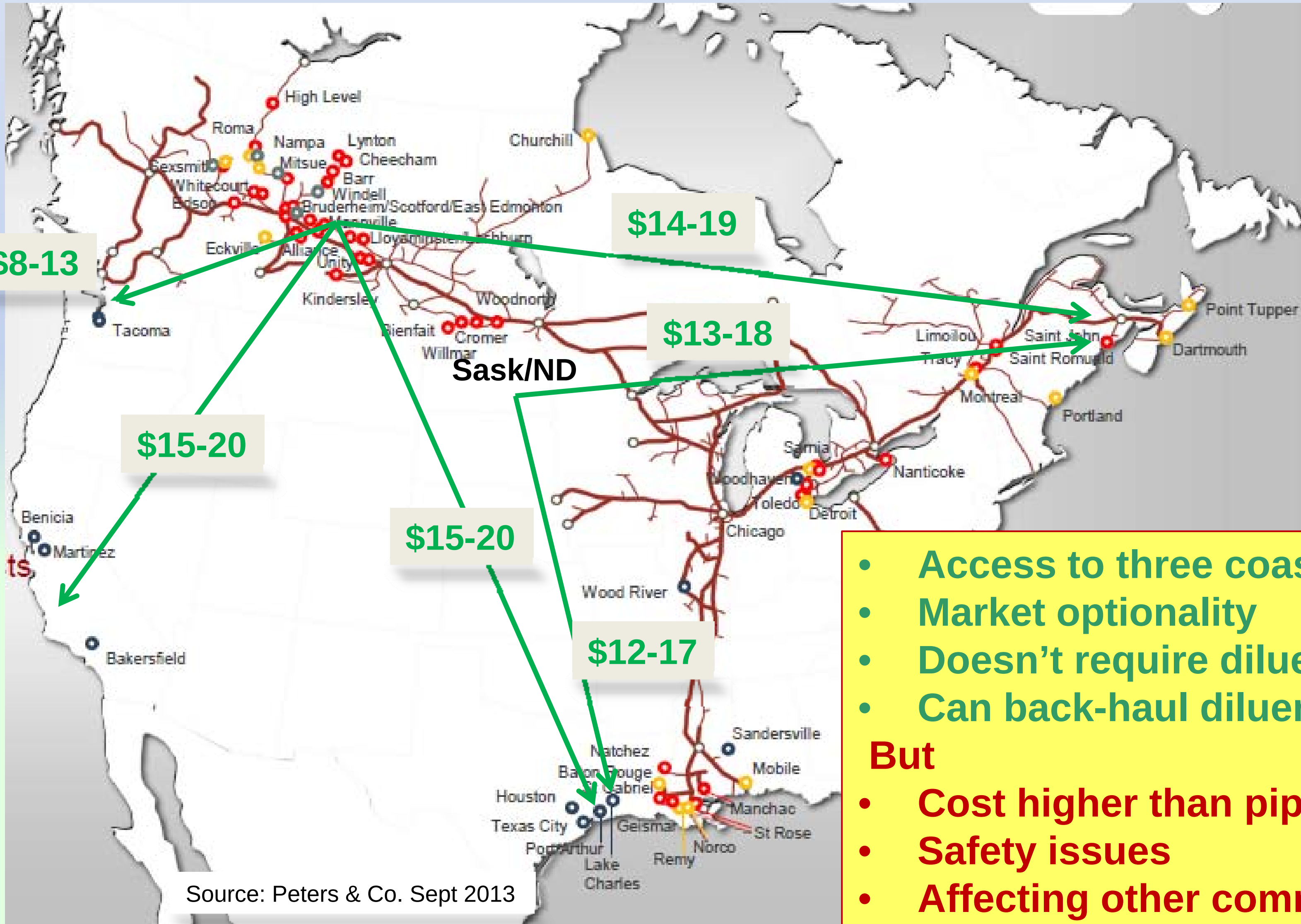


Capacity shown can be reduced by temporary operating and physical constraints.

Access to Markets – Pipeline Expansions in Development



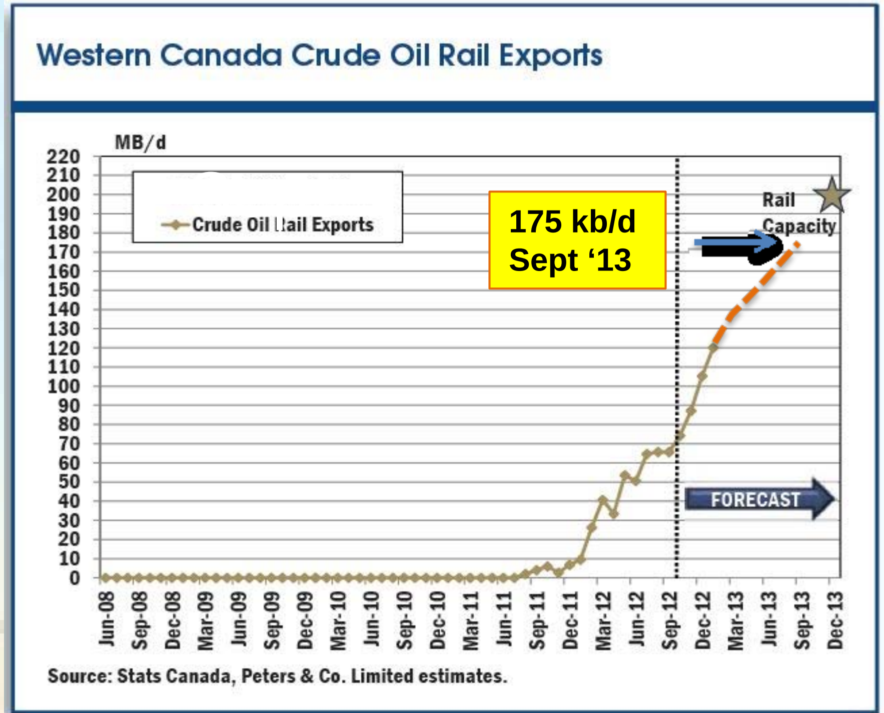
Crude by Rail Transport Costs



- Access to three coasts
- Market optionality
- Doesn't require diluent
- Can back-haul diluent

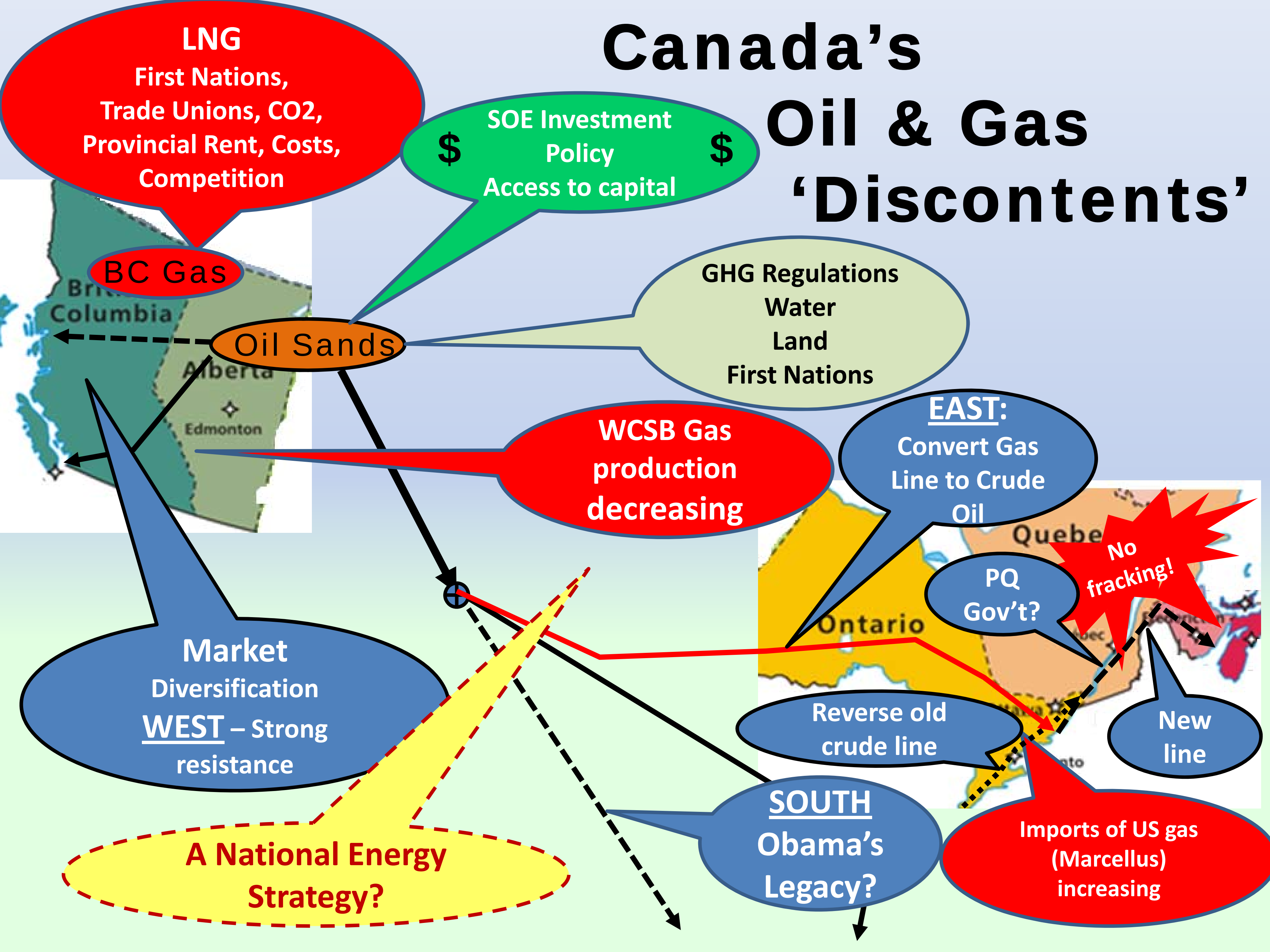
But

- Cost higher than pipe
- Safety issues
- Affecting other commodities



~900 kb/d rail <u>loading</u> capacity operational & announced in Western Canada

Photo: R. Skinner Oct 22 2013



Canada's
Oil & Gas
'Discontents'
LNG
First Nations,
Trade Unions, CO2,
Provincial Rent, Costs,
Competition
$ SOE Investment Policy $
Access to capital
BC Gas
British Columbia
Oil Sands
Alberta
Edmonton
GHG Regulations
Water
Land
First Nations
WCSB Gas production decreasing
EAST:
Convert Gas Line to Crude Oil
Quebec
No fracking!
PQ Gov't?
Ontario
Market
Diversification
WEST – Strong resistance
Reverse old crude line
New line
A National Energy Strategy?
SOUTH
Obama's Legacy?
Imports of US gas (Marcellus) increasing

Canada – US Energy: an On-and-Off Affair

- 1940s: Canada builds Canol Pipeline to Alaska (WW II Pacific)
- 1950s: Canada expedites Trans-Mountain PL to PADD V (Korean War)
- 1960s: US imposes import restrictions; Canada's National Oil Policy to accommodate exports to US
- 1970s: Canada terminates export licenses; Northern Pipeline Treaty: Canada agrees to expedite ANGTS pipeline
- 1980s: Canada – US Free Trade Agreement: US gets access & proportionality commitment to all Canadian O & G, while US reluctantly allows Canada access to 50 kb/d of US Oil.
- 1990s: NAFTA
- 2000s: Clean Energy Dialogue & alignment on GHG/Copenhagen
- 2010s: Hollywood 'Scientists' Energy Advisors to the White House