



# Shifting Sands

## The Evolving Environmental Context for Oil Sands Development

NEB Energy Futures Conference

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# The Pembina Institute

*“To advance sustainable energy through research, education, consulting and advocacy.”*

- Founded in Alberta in 1985
- Focus on energy & environment issues, & environmental economics
  - policy research and analysis
  - public interest advocacy and action
  - corporate environmental analysis and consulting
  - public / school education

# Perspective on Oil Sands

We envision an Alberta in which the pace, scale and terms of oil sands development:

- protect regional ecosystems and the global climate
- optimize financial benefit to the resource owners; and
- link to long-term strategies for Alberta's transition to a carbon-constrained future.

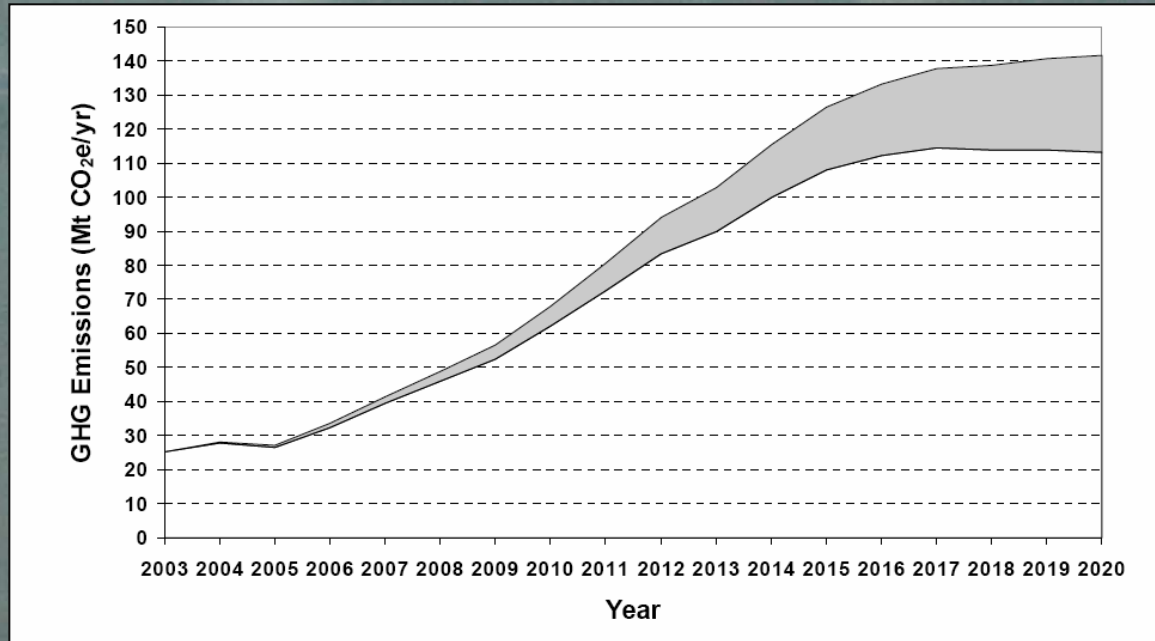


# Overview

- Environmental Implications
  - Climate Change
  - Impacts to the Boreal Forest
  - Fresh Water Resources
  - Toxics
- The Bigger Picture
  - Evolving Markets
  - Labour
  - Public Opinion
  - The Case for a Pause

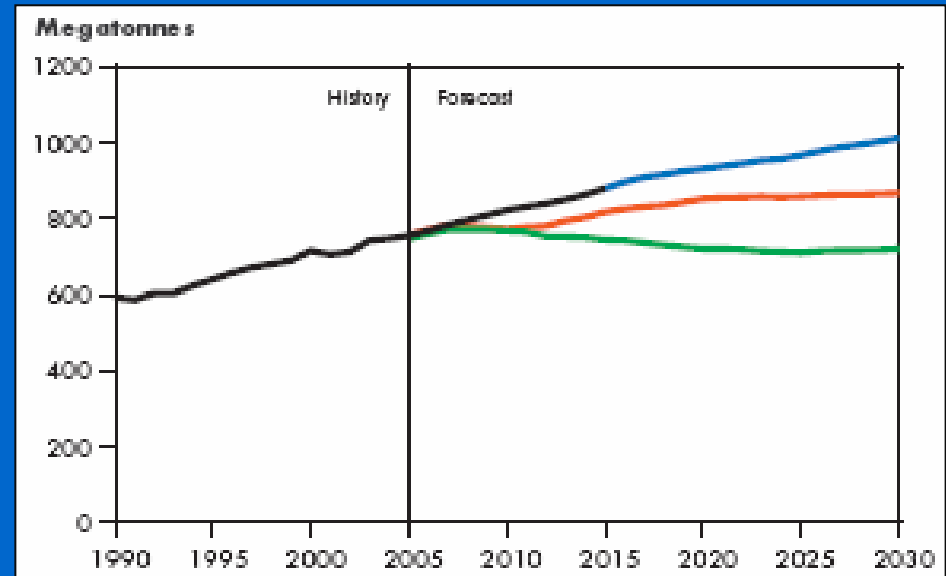
# Climate Change & Greenhouse Gas Pollution

- Canada's fastest growing source of new GHG pollution
- 3-5x more GHG intensive vs. conventional oil
- Responsible for 41-47% of "business as usual" growth to 2010



# Federal Climate Policy: More Effort Required

- GHG pollution only decreases in Triple E - but only partially meets 2020 target
- Alberta's self-isolation persists
- Edmonton Journal headline:



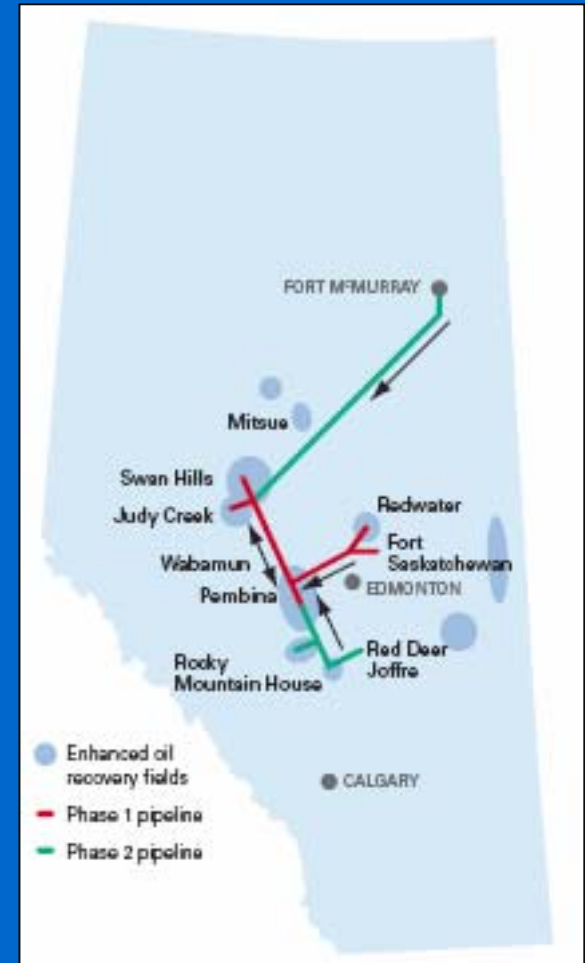
***Green the colour of misery for Alberta***

***NEB paints a punishing picture for oil-based economies in a cleaner world***

# Carbon Capture & Storage

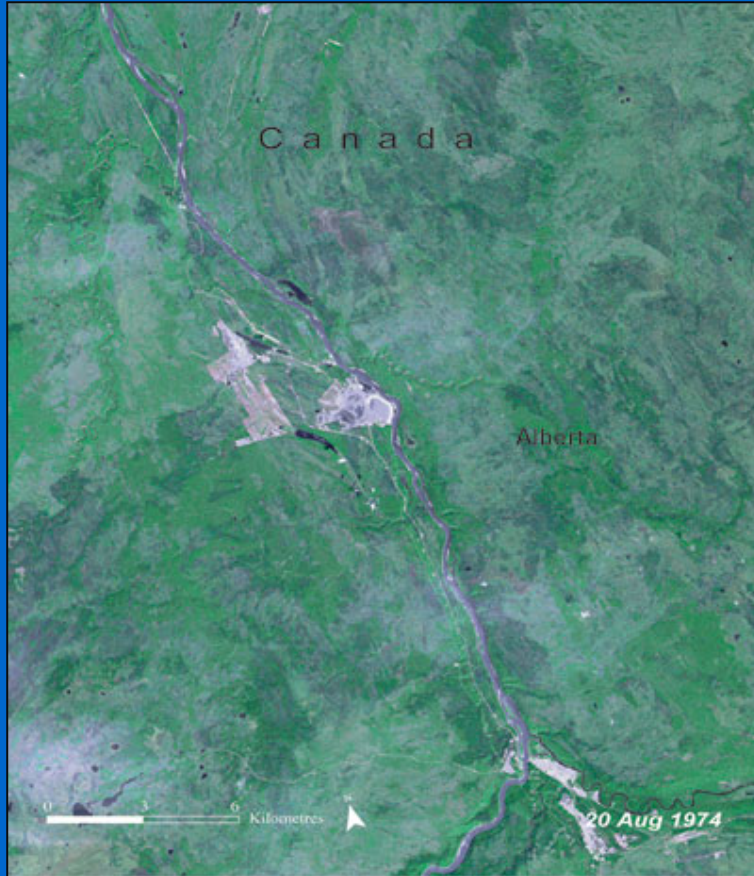
## The ICO<sub>2</sub>N Initiative

- ICO<sub>2</sub>N includes many oil sands players
- Making the case for CCS in Alberta
  - Entering period of rapid expansion
  - Significant near-term GHG reductions
- Who pays?



Source: ICO<sub>2</sub>N

# A Global “Hot Spot”



Athabasca oil sands listed as UNEP “hot spot” of environmental change

# Boreal Forest Impacts

- Planned development will impact >2,000 square kilometres
- 3,000 square kilometre surface mineable area
- Implications for wildlife from habitat loss & fragmentation - e.g. woodland caribou
- Loss of biodiversity, wetlands and wildlife habitat
- Permanent loss of peatlands
- Only 20% of potential oil sands leases (by area) have been issued

Photo: Jiri Rezac, WWF-UK

# Reclamation Challenges & Uncertainty



Current area impacted (over 35+ years) = 47,832 ha

Area under reclamation = 6,498 ha

Area certified reclaimed = 0 (*uncertain requirements*)

Long-term management of tailings = ???

Restoration to boreal ecosystem = ???

# Troubled Waters

- Entire watersheds are being drastically altered
- 2 to 4.5 barrels of fresh water per barrel of bitumen (after recycle)
- Oil sands withdrawals from Athabasca River equivalent to a city of 2 million
- Industry use takes precedence over protecting the fishery - water use issues remain unresolved
- *In situ* using groundwater - implications for drying up wetlands, water quality, waste management

Photos: Jiri Rezac, WWF-UK  
& David Dodge, Pembina Institute

# Tailings Liabilities

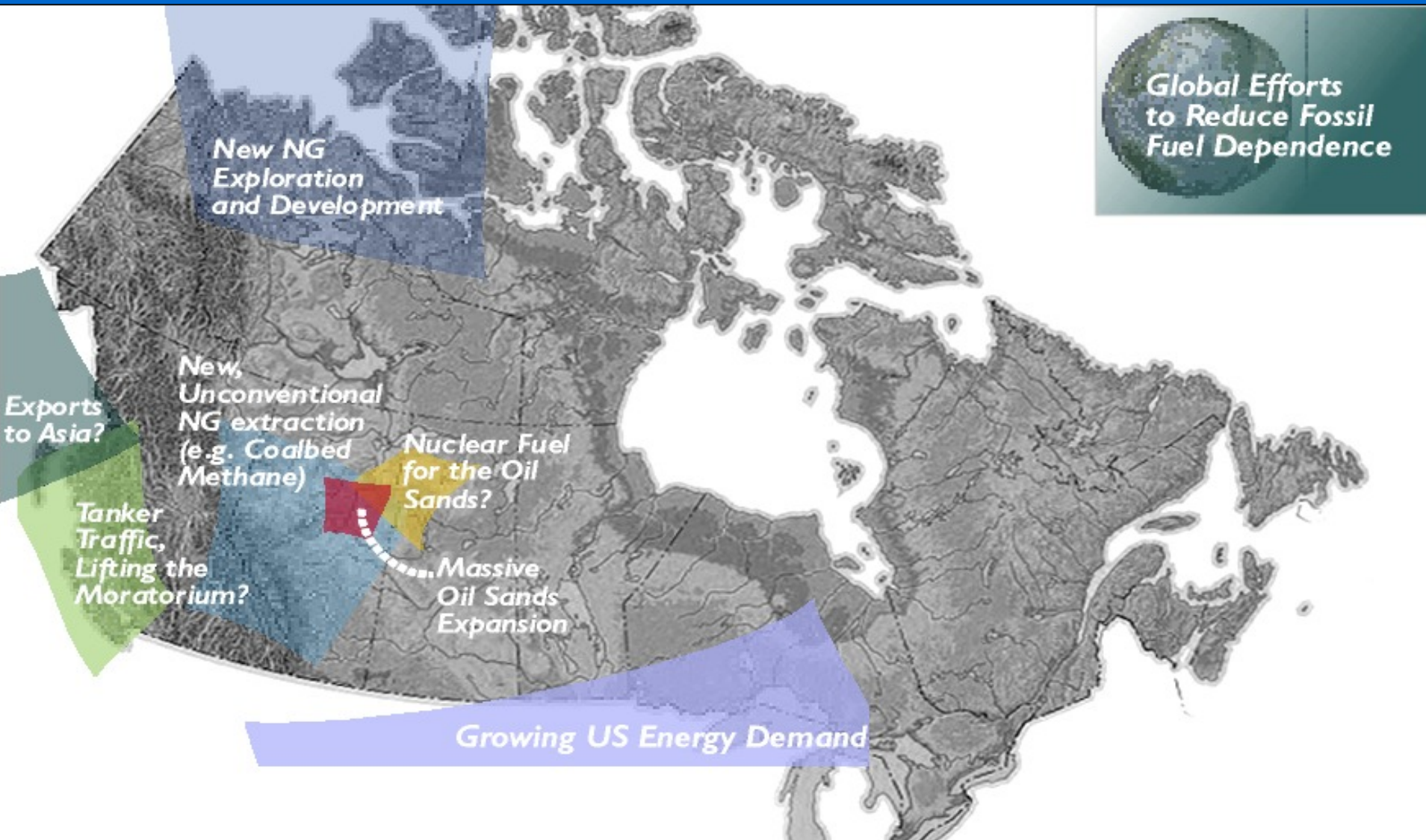


- Tailings by-product stored in “ponds” that already cover 50 km<sup>2</sup>
- Leaching into groundwater & Athabasca River
- No demonstrated long-term solution for mature fine tailings (MFT) - perpetual liability?
- Acute & chronic toxicity - e.g. naphthenic acids, PAHs, metals
- Source of methane emissions (GWP 23x that of CO<sub>2</sub>)

Photo: Jiri Rezac, WWF-UK



# Oil Sands in the Bigger Energy Picture



# Evolving Markets

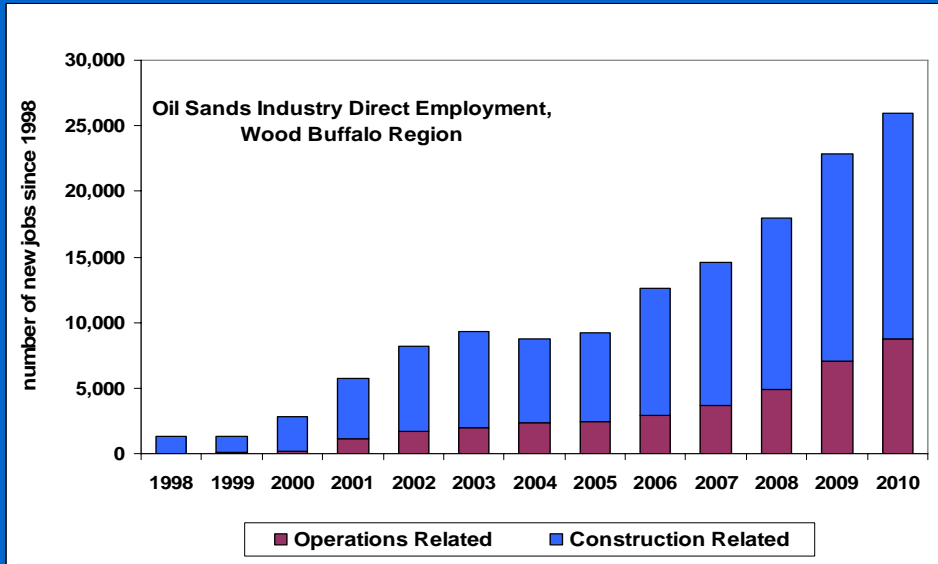


- Climate consciousness in the United States
  - Low Carbon Fuel Standard (California) & Section 526 of US Energy Bill (Federal)
    - Full cycle GHG pollution of transportation fuels must be equal or better than conventional oil.
- Asian Markets
  - Contingent upon new pipeline capacity to West Coast
    - Strong opposition to proposed Enbridge Gateway
    - Moratorium on tanker traffic
- NEB's scenarios assume timely development of markets and transportation infrastructure
  - These assumptions are no longer conservative

Photo: Jiri Rezac WWF-UK

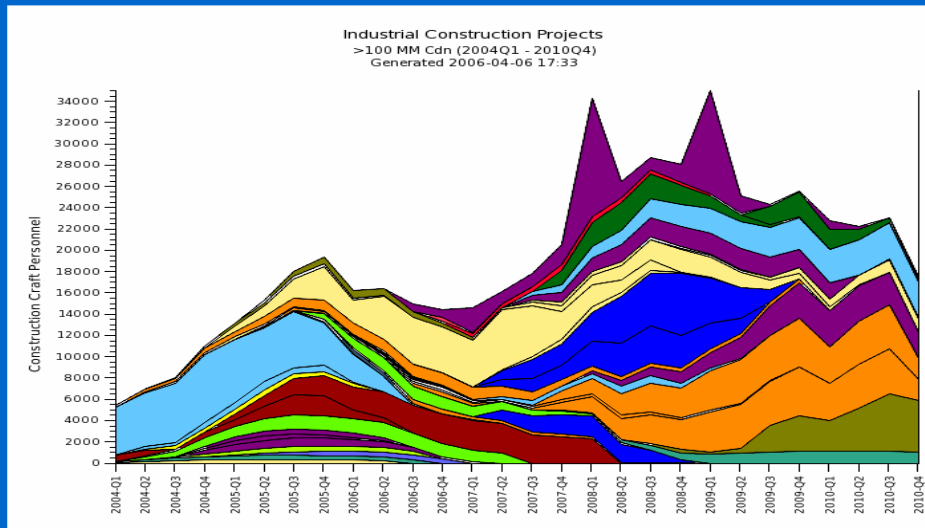
# Demand for Labour

Source: RIWG



**Wood Buffalo Regional Cumulative Job Growth - 1998 - 2010 Operations & Construction Jobs**

Source: RIWG/Nichols Applied Management – 2005  
 Note: 2006 forecast under development



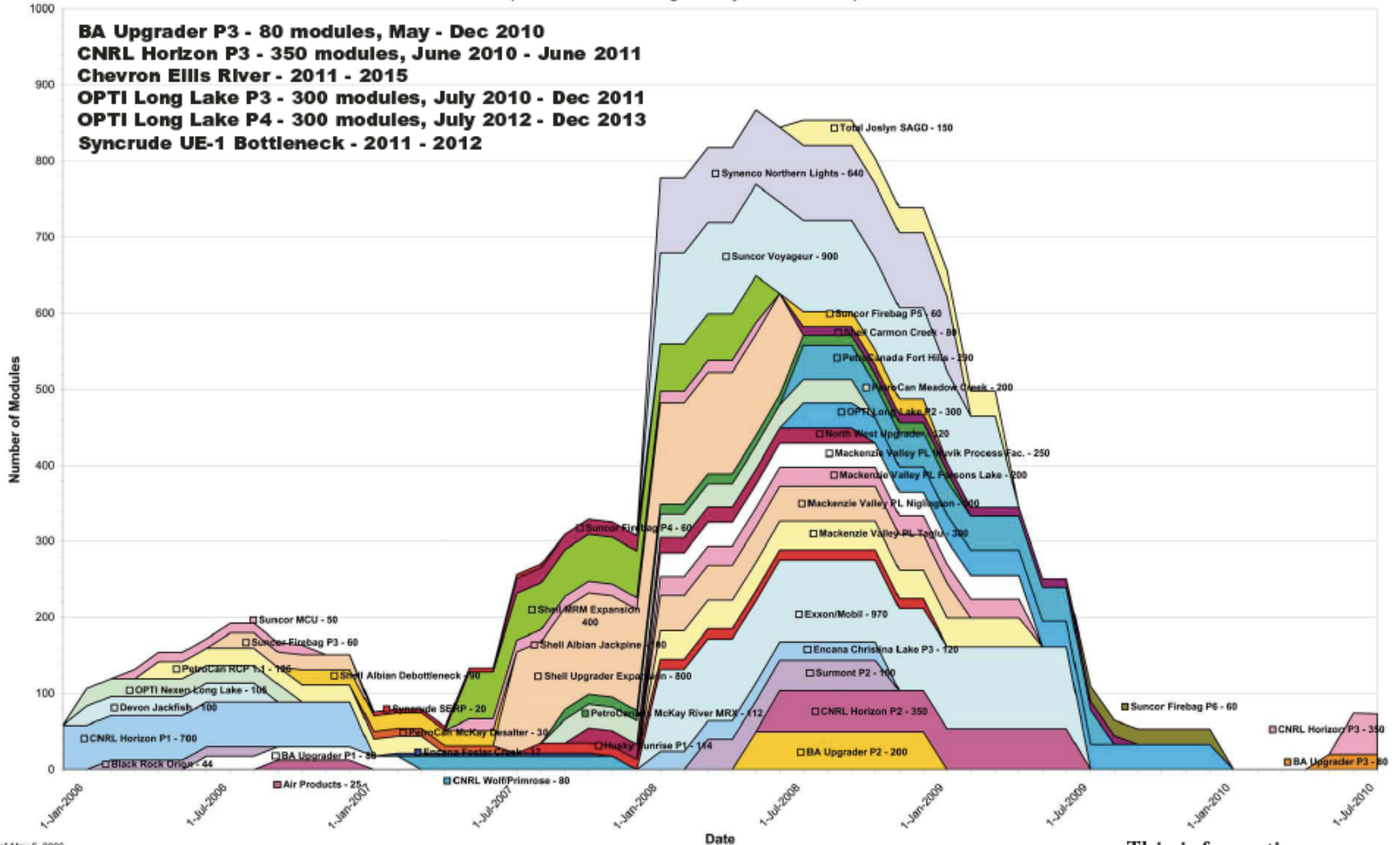
**Alberta Construction Job Growth 2004 – 2010 Projects over \$100M**

Source: COAA, LMI, CSC - 2006

# The "golden wall"

## ● Forecast: Oil and Gas Project Modules Under Construction

(Modules Standing at any Given Time)



As of May 5, 2006  
 This information was compiled by Lockerbie and Hole for internal use.  
 Lockerbie and Hole does not accept any responsibility for the accuracy of the data.

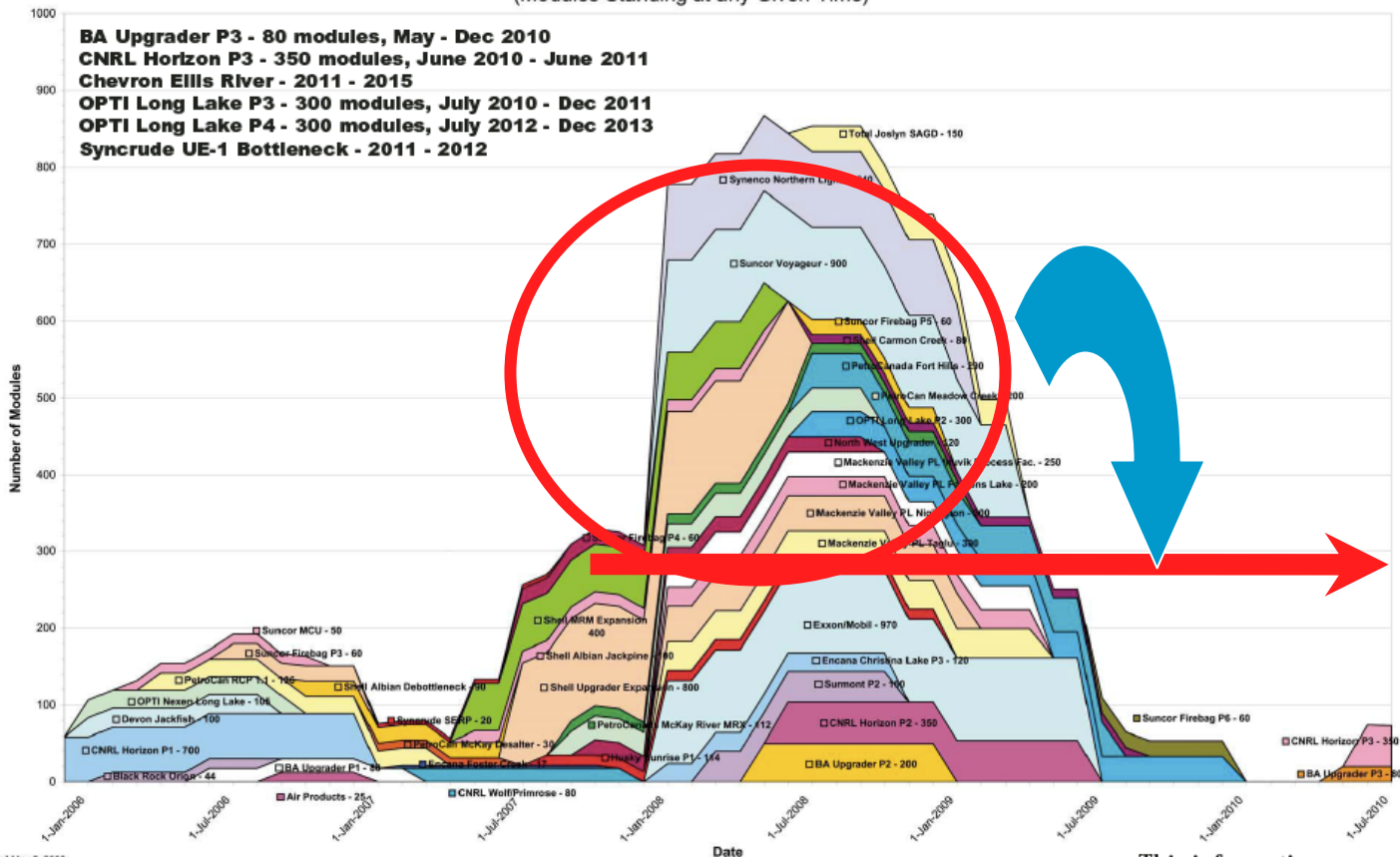
Note: Data assumes 8 week construction schedule

This information was compiled  
 by Gary Cutmore for Lockerbie and Hole

# “BANKING” Jobs

## ● Forecast: Oil and Gas Project Modules Under Construction

(Modules Standing at any Given Time)



# The System is Broken

**Oil sands issues are symptomatic of systemic flaws. Addressing them would benefit all of Alberta:**



**Implement plans for land use, cumulative impact management, infrastructure,**

**management in Upgrader Alley**

**Re-build trust in mineral tenure, energy decision-making, public benefit from royalties**

# The Case for an Oil Sands Pause

Current production 1.3 million bpd. Albertans already paying the “price of prosperity” - economically, socially, environmentally.

Approved projects will > double production to 2.7 million bpd - no plan for addressing incremental & cumulative consequences.

**Inability to catch up or get ahead:** consequences of unmanaged, unplanned growth will be compounded.



# Industry Not Implementing Best Practices



Operation	Percentage Score
Albian Existing (Muskeg River Mine)	56
<b>Total E&amp;P</b>	<b>43</b>
<p><i>Potential annual environmental benefit through oil sands operations meeting performance standards of current industry leaders</i></p> <p><b>15,000 tonnes of NOx</b>  <b>8,500 tonnes of SO<sub>2</sub></b>  <b>50,000 tonnes VOCs</b>  <b>6,000,000 tonnes GHGs</b>  <b>73,500,000 cubic metres of water</b></p>	
Synenco	18
<b>AVERAGE SCORE</b>	<b>33</b>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: #f4a460; border: 1px solid black; margin-right: 5px;"></div> <span>Existing Projects</span> </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background-color: #e0e0e0; border: 1px solid black; margin-right: 5px;"></div> <span>Proposed and Approved Projects</span> </div> </div>	

# Shifting to a Proactive Approach

Efforts to manage consequences remain insufficient - neither the Radke or Oil Sands Multistakeholder committee (consensus) recommendations are adequate:

- “band aid” approach & lack of integration
- core issue - pace & lack of plan - not addressed
- remains fundamentally reactive to consequences

A pause in approvals allows:

- government to concentrate human & financial resources on long-term policy & program solutions
- industry to re-focus on quality before quantity - advance technology & process opportunities
- progress in resolving issues of Aboriginal consultation & accommodation

# Public Support for a Pause

**71%** of Albertans think the GOA should suspend new oil sands approvals until infrastructure & environmental management issues are addressed.

**74%** of Albertans want to see government manage the pace of oil sands development, only 20% believe market forces should drive the pace.



# For more information:

Visit [www.oilsandswatch.org](http://www.oilsandswatch.org)

- **Undermining the Environment: The Oil Sands Report Card**
- **Blueprint for Responsible Oil Sands Development**
- **Oil Sands Fever**

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