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Oil Sands – For the Record

Don Thompson

Alberta Council of Turnaround Industry Maintenance Stakeholders (ACTIMS)

July 7, 2010

Canada's oil sands deposits within the Boreal Forest

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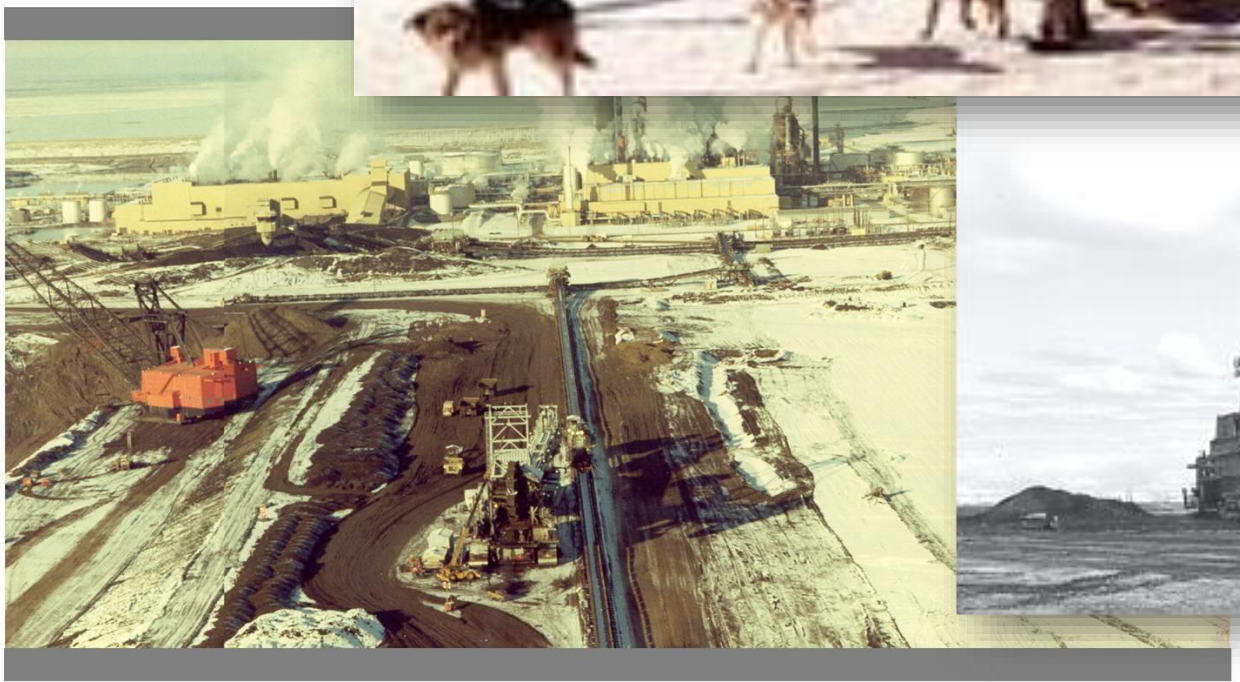
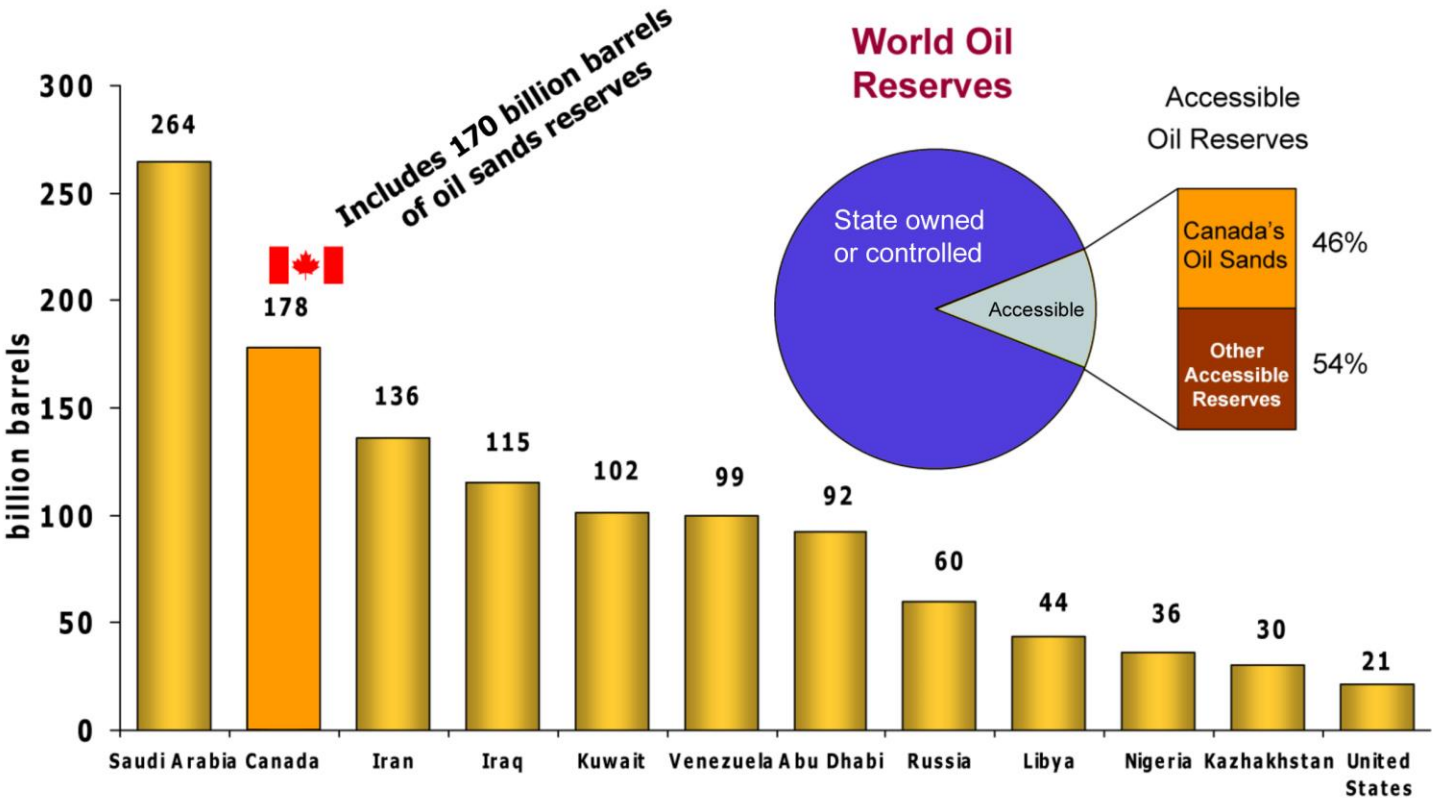
30 years ago…oil sands were a technical and economic curiosity



Today…oil sands are a globally significant resource



Source: Oil & Gas Journal Dec. 2008

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Oil sands are built on a history of innovation and technology

- Improvements in technical efficiency
- Reduction in environmental impacts
- Reduction in operating costs
- Increase in reserves base

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Listening and engaged

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Dragline and bucketwheel to truck and shovel

O & K Bucketwheel Reclaimer

Truck and Shovel

Bucyrus-Erie Dragline

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Increased size = reduced operating costs and emissions intensity

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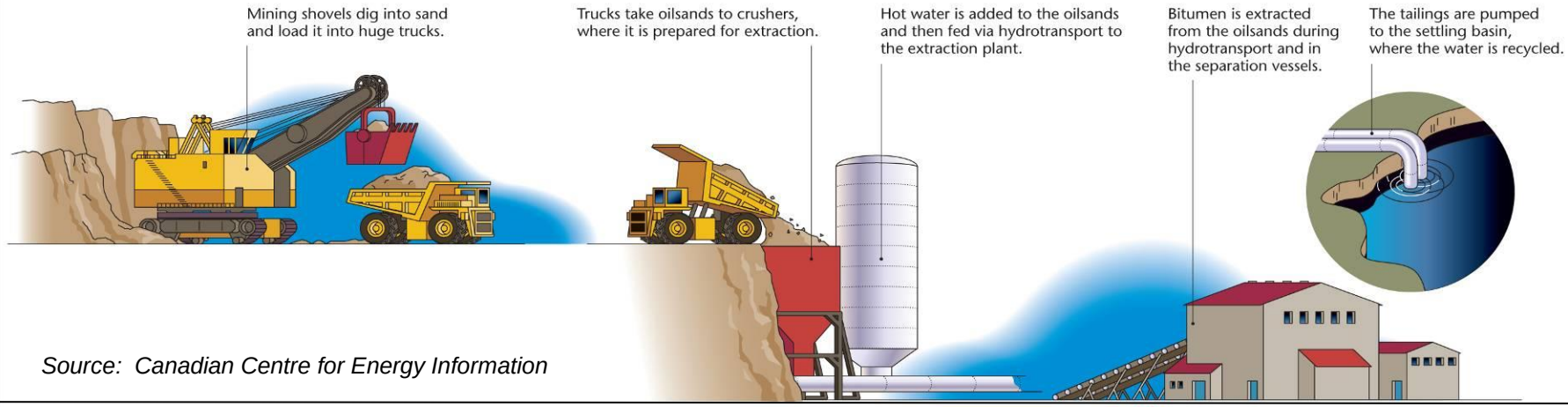
Oil sands production technologies have significantly evolved…

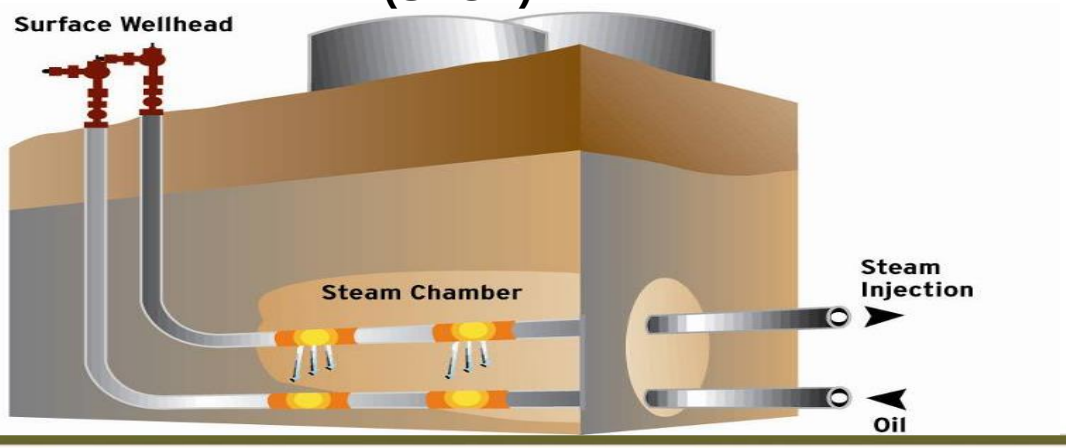
Mining – 20% of the oil sands resource is less than 200 feet deep



Source: Canadian Centre for Energy Information

In-Situ – 80% of the oil sands resource is more than 200 feet deep

Steam Assisted Gravity Drainage (SAGD)



In-situ operations:
- **Do not have mines**
- **Or tailings ponds**

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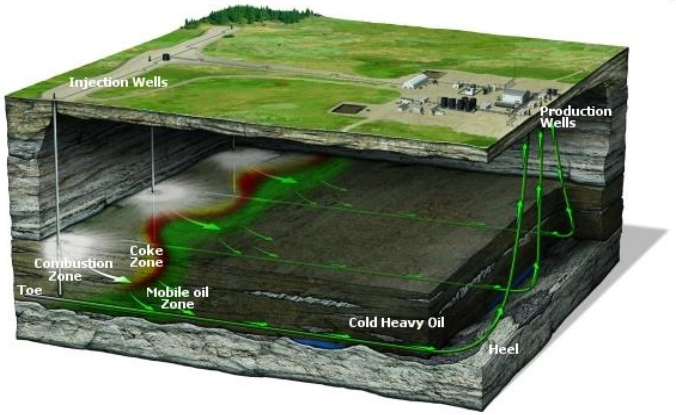
Other examples of technology

- Less energy = less GHG
  - Syncrude is using low energy extraction at it's Aurora mine (35ºC instead of 80ºC)
  - Uses about 1/3 of the energy

- Less water, less energy and less emissions
  - Petrobank THAI process uses underground combustion to extract the oil from the oil sands eliminating the need for steam



- Using saline (non-potable) water
  - Devon Jackfish in-situ project was the first oil sands operator to use 100 per cent saline water
  - Other in-situ oil projects are significantly increasing saline water use

Flue Gas Desulphurization

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Mature Fine Tailings (MFT) drying experience

Starting Material

After

Evaporation

After Freeze / Thaw

Suncor Pond #1 Tailings Reclamation Plan…

Reclamation technology

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Setting the record straight

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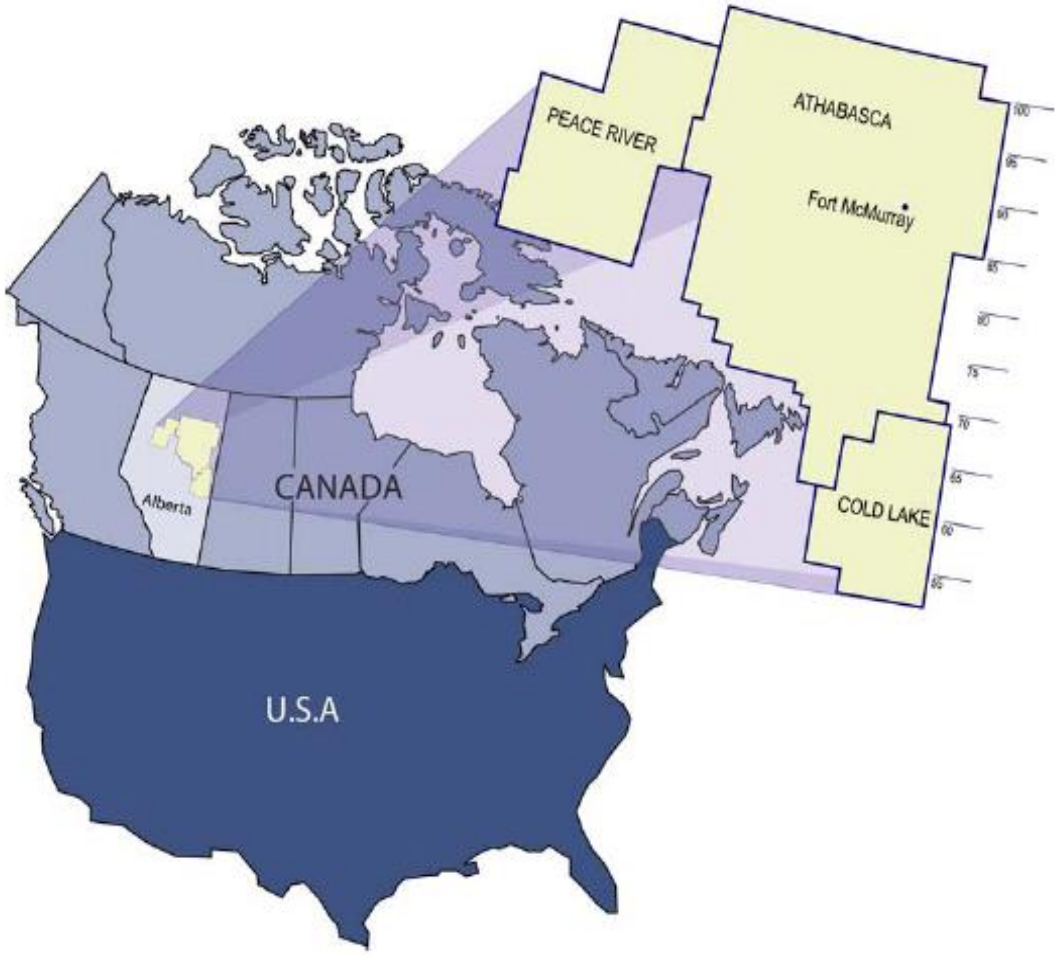
Canada's oil sands deposits



Source: CERI

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It isn’t a lie if you don’t tell the whole truth

Photo credit:
National Geographic – March, 2009 edition

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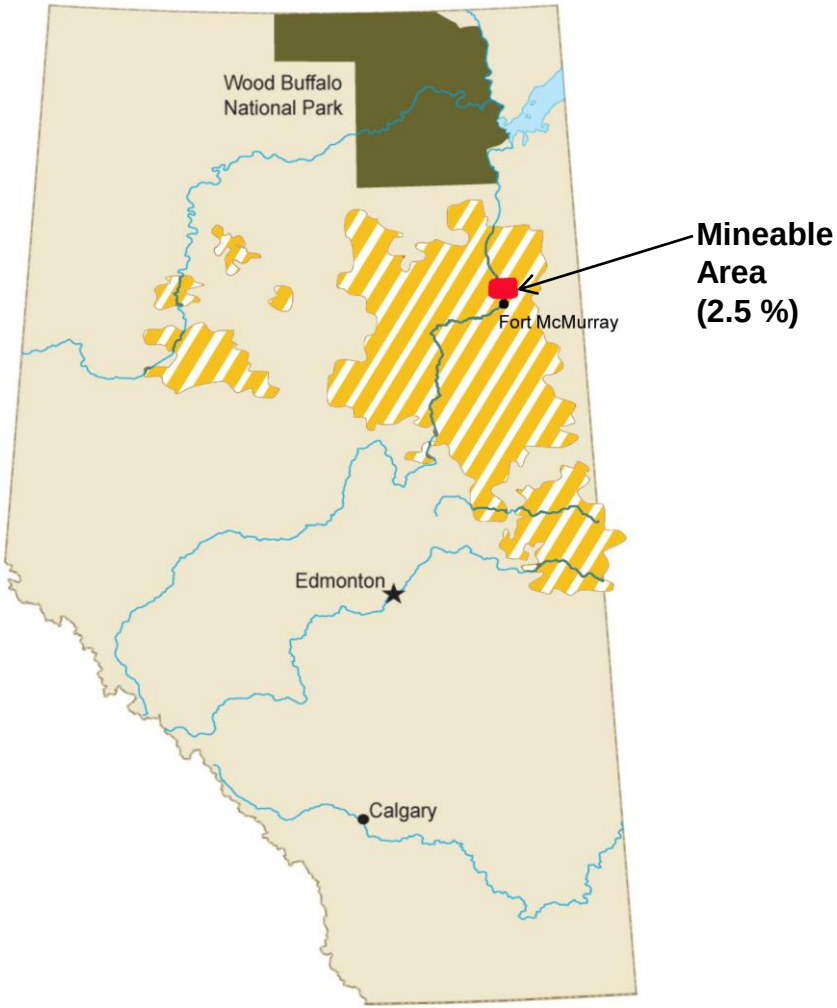
Boreal forest use



One-hundredth
of one per cent mined

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Reclamation

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Syncrude's 300 Wood Bison

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97.5 per cent of the surface area is not mineable…

…and must be produced by in-situ technologies

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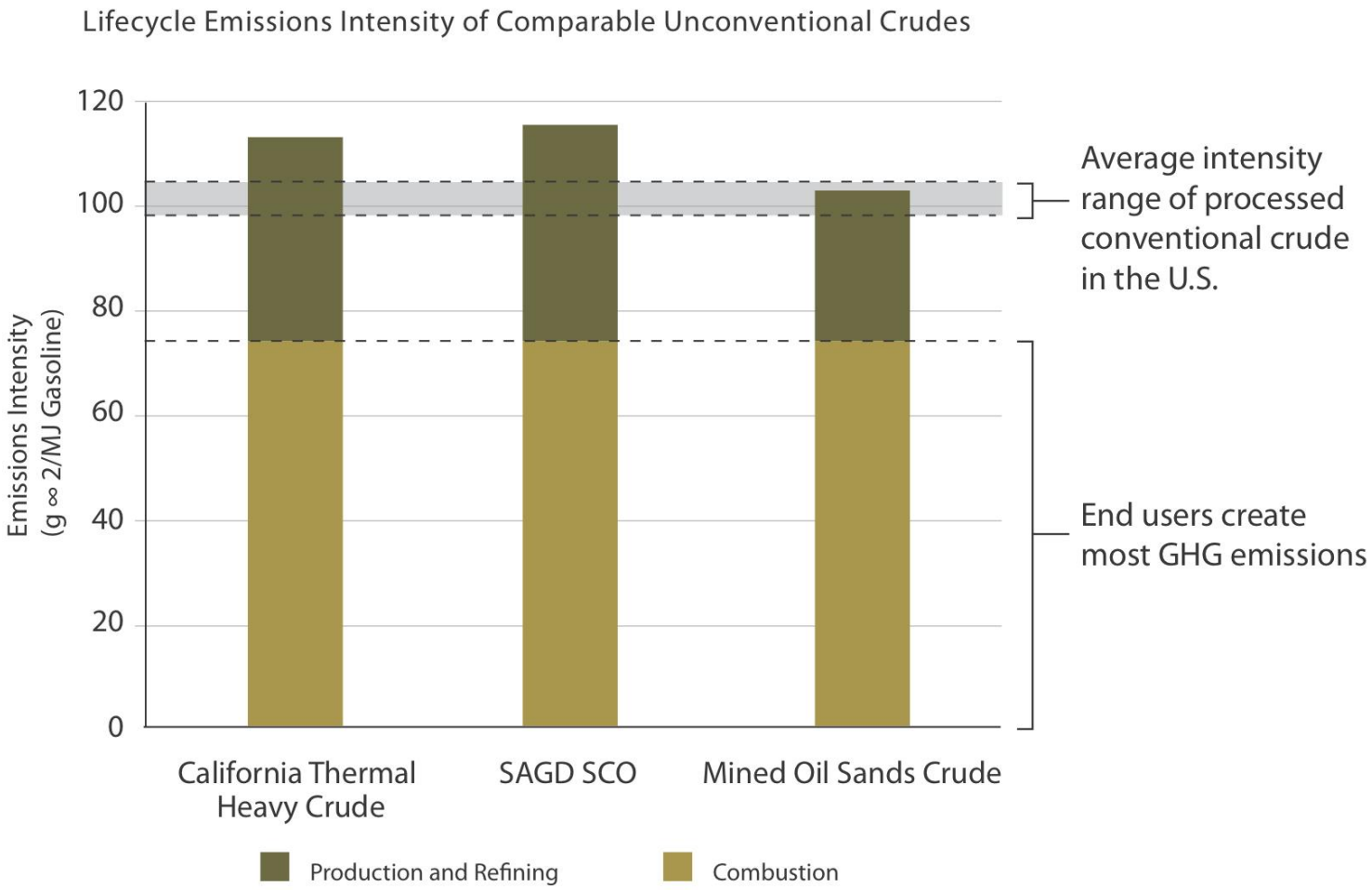
Carbon footprint of oil sands is comparable to conventional crudes processed in the U.S.



Source: Life Cycle Assessment Comparison of North America and Imported Crudes
Jacobs Consultancy, July 2009

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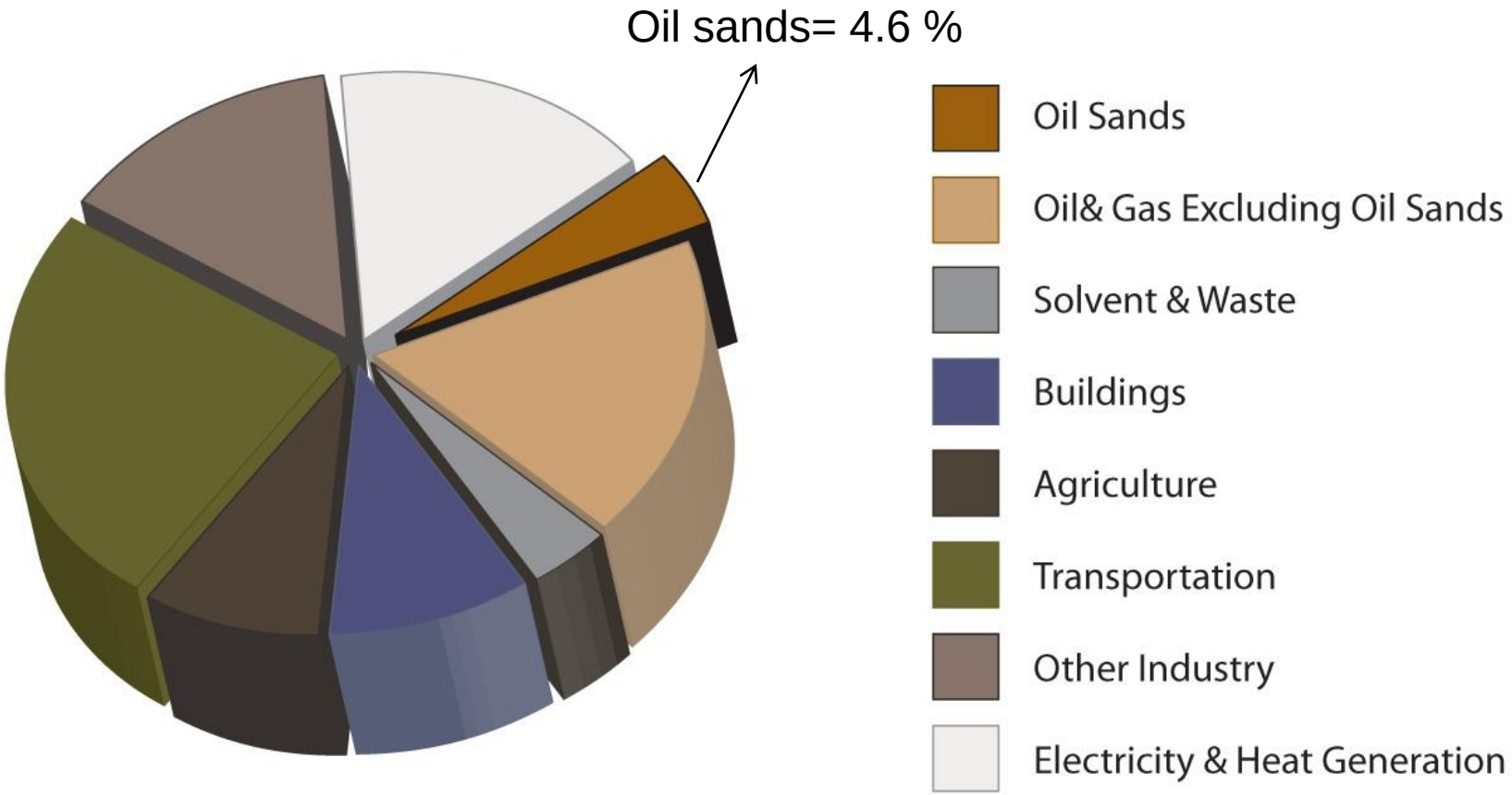
In Canada, 95% of GHG emissions come from sources other than oil sands



Source: Environment Canada

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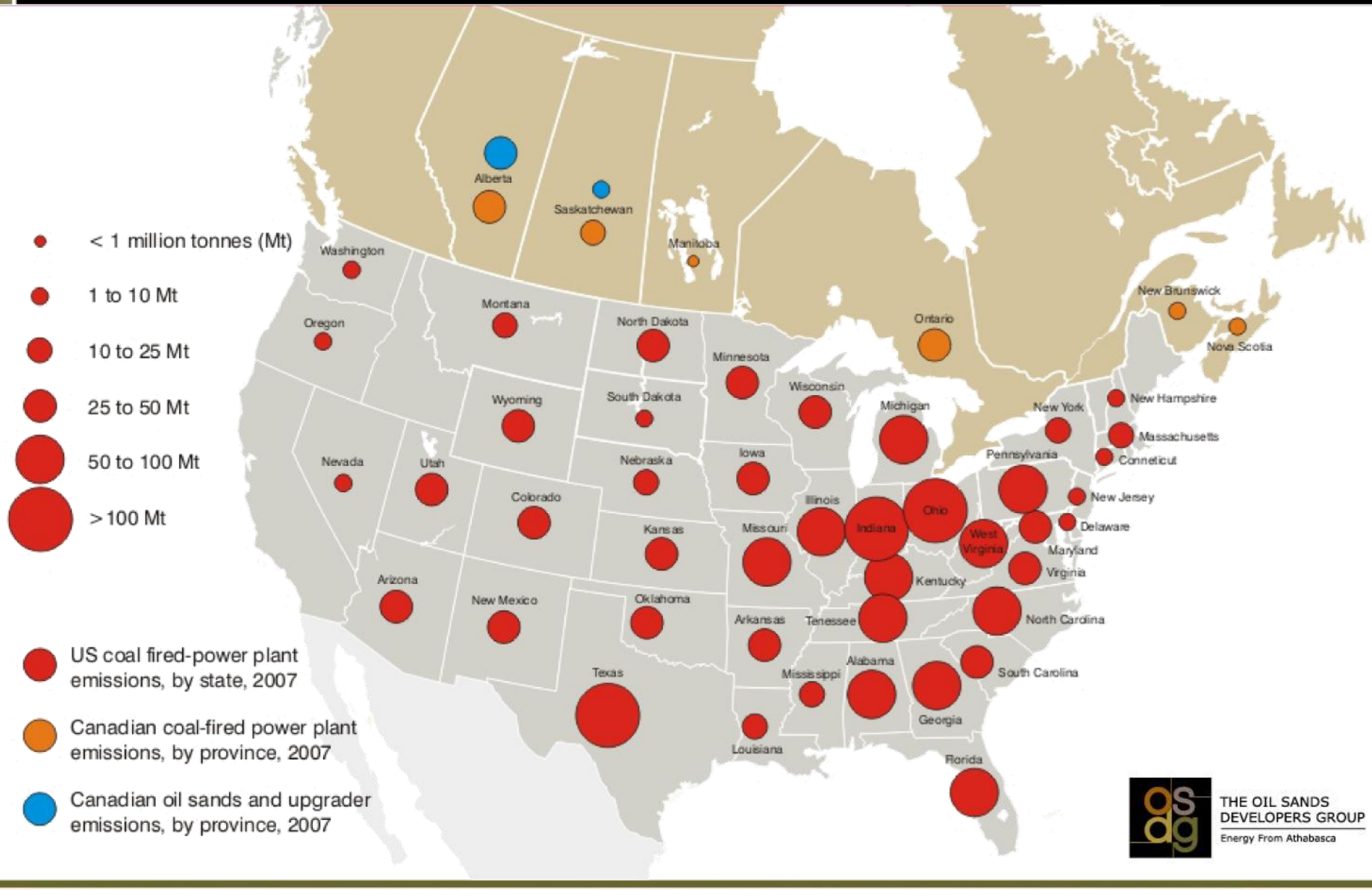
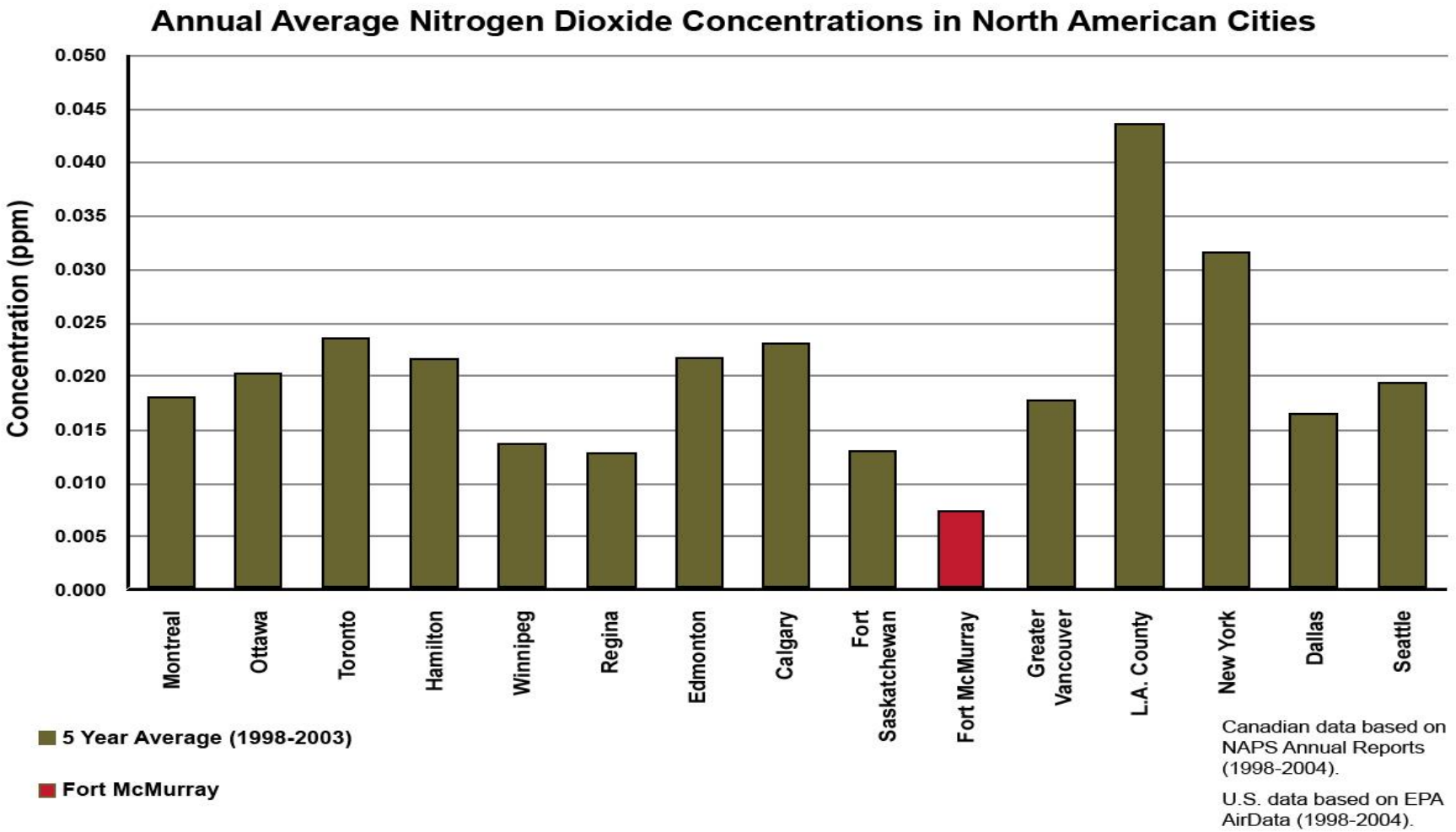
North American carbon footprint - oil sands and coal



We protect regional air quality…



Source: CASAhome.org

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…and monitor it continuously and transparently

Air monitoring station

www.wbea.org

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News headline

canada.com
WHERE PERSPECTIVES CONNECT

Two-jawed mutant fish fuels oilsands dissent

Kelly Cryderman
Canwest News Service

Wednesday, August 20, 2008

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Headline: U of A Scientist says fish caught in Lake Athabasca doesn't have two mouths

"This is a known and not unusual phenomenon in dead goldeye."

Dr. Joe Nelson, University of Alberta

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Bitumen naturally seeps into the Athabasca River

www.ramp-alberta.org

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Water Monitoring

"…water quality…in the Athabasca River…assessed as having Negligible-Low differences from regional baseline water quality…"

Source: Regional Aquatics Monitoring Program (RAMP) 2009 Technical Report

www.ramp-alberta.org

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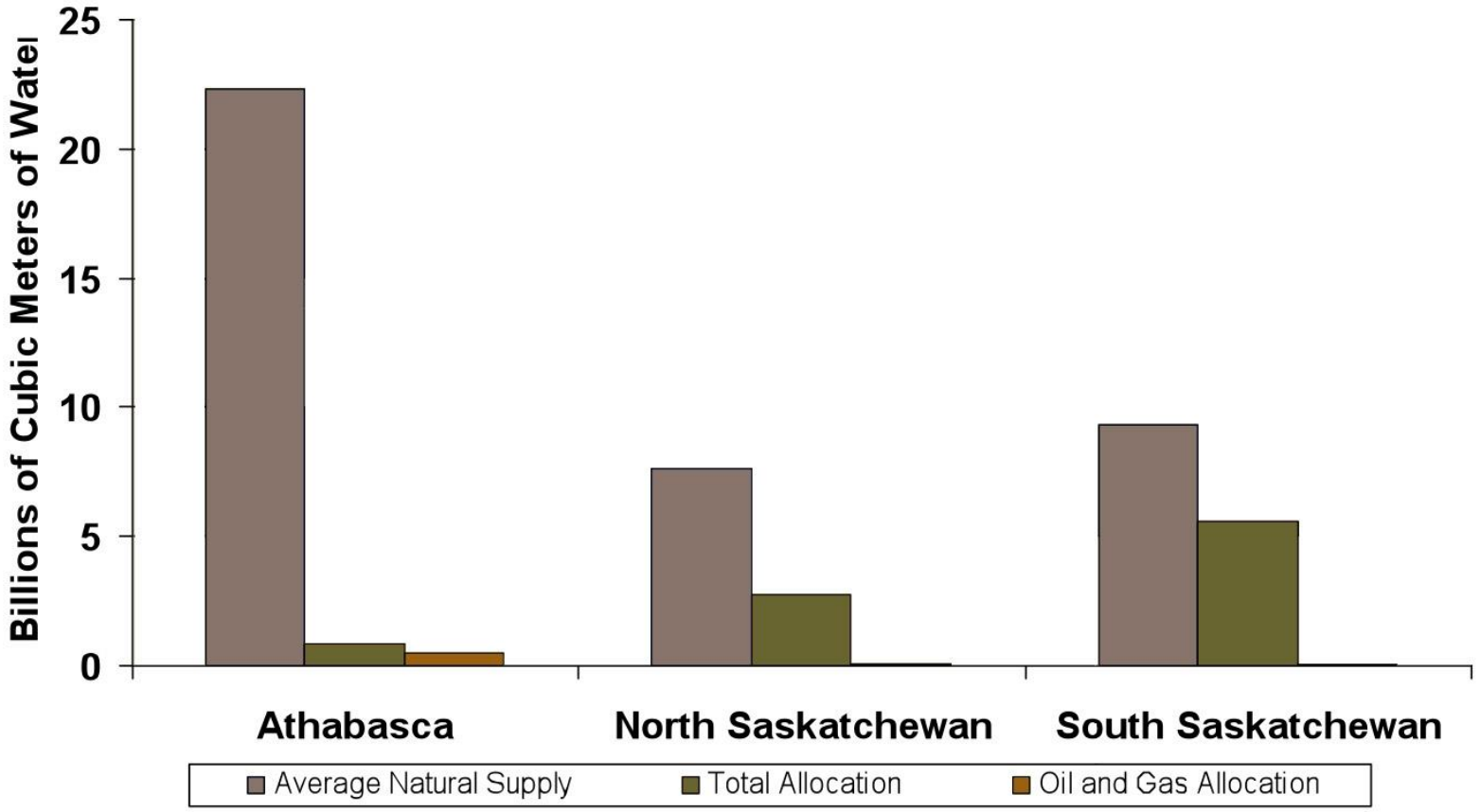
Perspective: Water use from Alberta river basins



Source: AENV state of the basin website

Oil sands and water use

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The oil sands industry is highly regulated

- Alberta Environment
- Sustainable Resource Development

"…At the project level, government regulation of oil sands activities is stronger than in many other oil-producing regions in the world."

Source: Cambridge Energy Research Institute. *Growth in the Canadian Oil Sands Report 2009*

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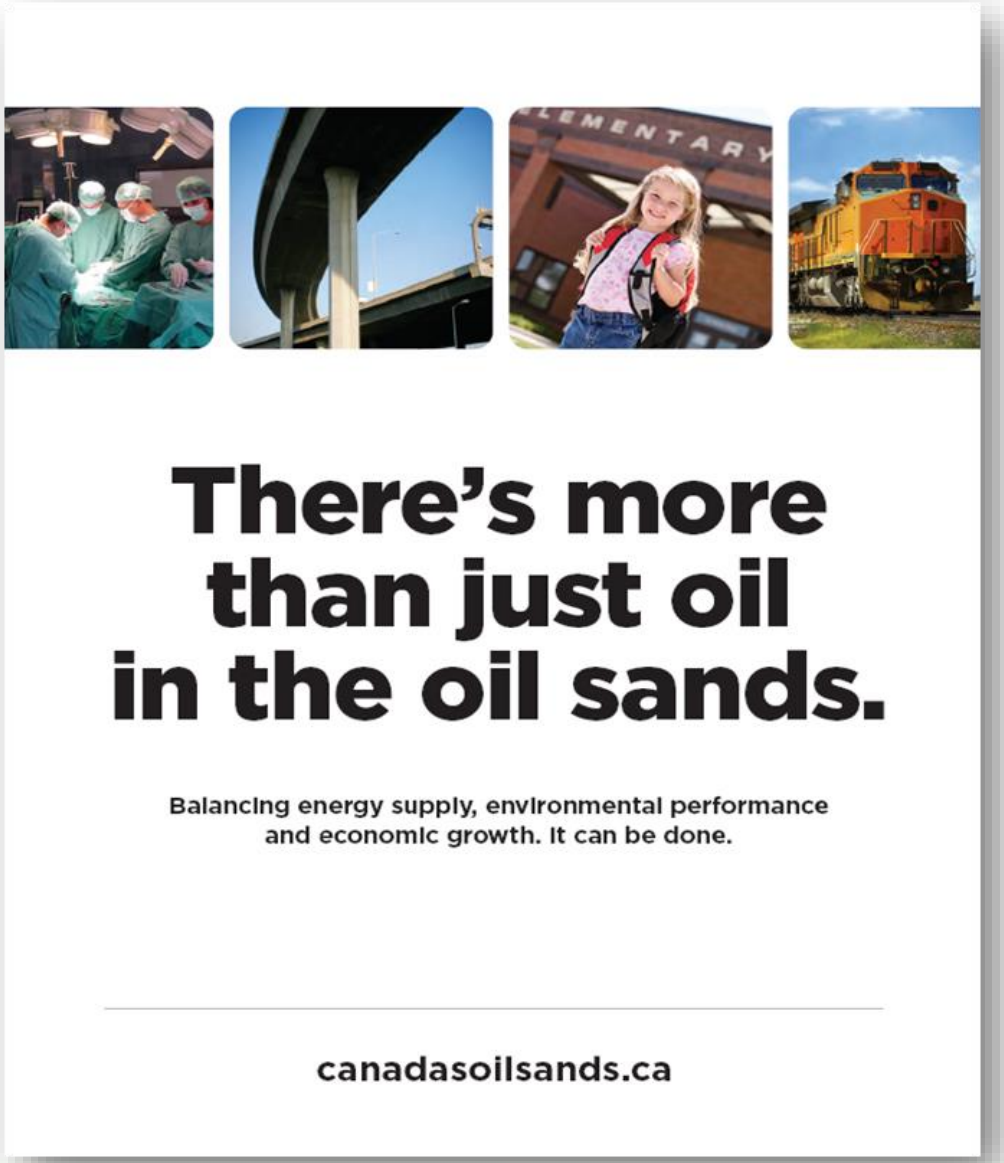
…456,000 jobs linked to the oil sands…



Economic and employment impacts of oil sands over 25 years...[1]

Location	$ million GDP	Jobs
Total Canada	1,738,253	456,000
Alberta	1,574,530	352,600
BC	45,474	28,500
Ontario	54,850	32,000
Quebec	23,172	15,000
Saskatchewan	18,694	12,000
Manitoba	11,548	8,500
Maritimes	4,775	3,800
Northern Canada	1,591	800

...extend across Canada

[1]Canadian Energy Research Institute, *Economic Impacts of the Petroleum Industry in Canada. July, 2009*

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Existing and proposed oil sands projects

1) Operating Projects: 1.78 M bbl/d

- Mining – 0.96 M bbl/d
- in-situ – 0.82 M bbl/d

2) Under Construction: 0.62 M bbl/d

- Mining – 0.39 M bbl/d
- in-situ – 0.23 M bbl/d

3) Projects with Regulatory Approval 1.70 M bbl/d

- Mining – 0.88 M bbl/d
- in-situ – 0.81 M bbl/d

4) Projects Under Regulatory Review: 1.64 M bbl/d

- Mining – 0.52 M bbl/d
- in-situ – 1.12 M bbl/d

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Data source: OSDG, Nichols Applied Management

Production / Production Growth Potential

- Total Existing Capacity: 1.78 MBbl/d
  - Operating and sustaining existing capacity requires expenditures of $18 Billion per year.
- Total Existing and Under Construction = Production Capacity of 2.4 MBbl/d
- Total Existing, Under Construction and With Regulatory Approval = Production Capacity of 4.1 MBbl/d

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Balancing realities

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Setting the Record Straight

By Don Thompson

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Disclaimer

This presentation contains forward-looking information. Actual results could differ materially due to market conditions, changes in law or government policy, changes in operating conditions and costs, changes in project schedules, operating performance, demand for oil and gas, commercial negotiations or other technical and economic factors.

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