



Outline

- Current Views on Energy
 - Commodity Price and Capital
 - Energy literacy
 - A crowded campaign
- What do you know about Suncor and the Oil sands?
- Suncor's Goals and GHGs
- Rational Discussion about Energy



It's all about education about energy sources and our use of energy



Calgary Herald Sunday Feb 22, 2009



Globe and Mail, 2010



"There is no realistic scenario where the oilsands are the difference between success and failure in addressing climate change."

— Michael Levi, David M. Rubenstein Senior Fellow for Energy and the Environment, Council on Foreign Relations, *New York Times* opinion page, Sept. 5.



PHOTO: COUNCIL ON FOREIGN RELATIONS

The challenge is that we each have to develop our own opinion on oil sands and energy topics.



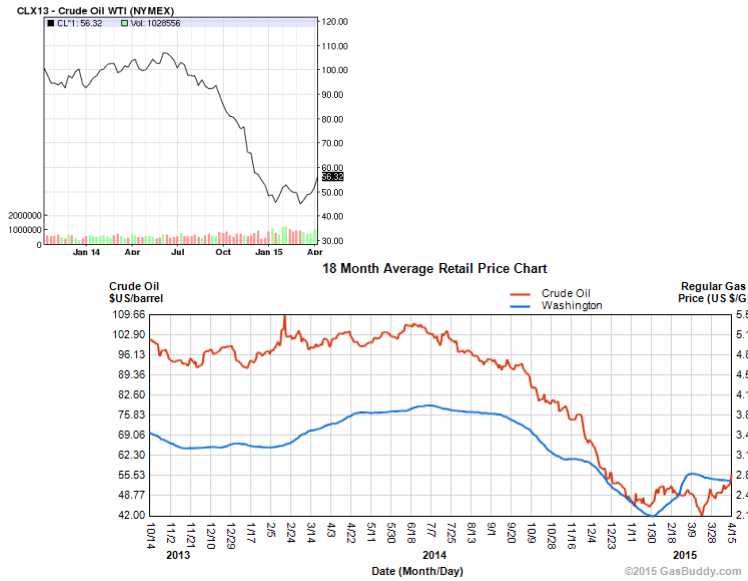
"From the ground [in the oilsands] you feel like you are in some frozen gulag, forced-labour camp, or some dead planet from a science fiction movie where convicts are forced to labour. Of course, neither of these comparisons is really much of a stretch."

— Photographer Garth Lenz regarding his photo exhibition *Canada's Tar Sands and the True Cost of Oil*, on display in Brooklyn, N.Y., in September as part of *Ten Years after 9/11: Searching for a 21st Century Landscape*, *The Epoch Times*, Sep. 10.

Oilsands Review November 2011



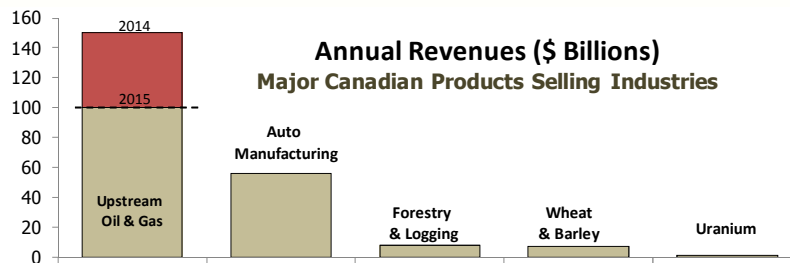
The joys of being a commodity producer



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Impact of declining commodity prices in 2015

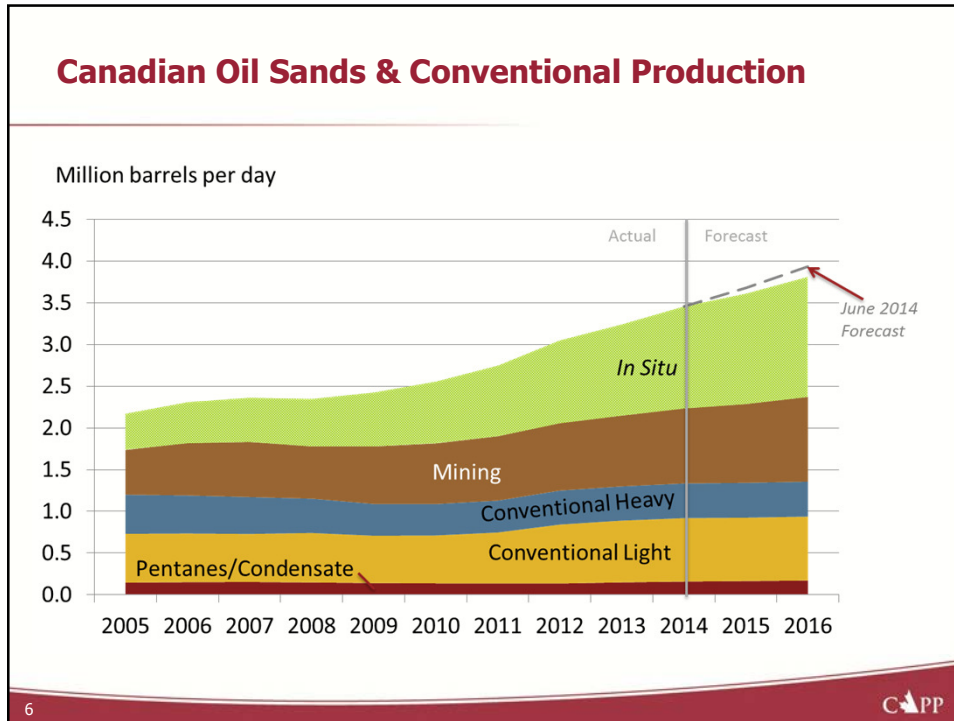
- Industry revenues down one third
 - from \$150 billion in 2014 to \$100 billion in 2015
- WCSB capital investment down 33% (\$23 billion)
 - from \$69 billion in 2014 to \$46 billion in 2015:
- Well drilling down 30% (3,150 wells) from 2014
- Oil and gas share of TSX down from 20% in 2014 to 12% in January 2015



Source: ARC Financial & CAPP

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- ### My typical day at Suncor - List of Challenges
- Dirty Oil → many misconceptions in public
 - Fastest growing source of GHG
 - Toxic emissions
 - Little / no reclamation
 - Impact on boreal forest; impact on wildlife habitat
 - Tailings Ponds > Water Use – fundamental to OS operations
 - Athabasca River impacts >
 - Downstream health >
 - No GHG Target or Federal regs
 - Market Access – concerns about P/L & rail
 - Keystone XL
 - Northern Gateway
 - Line 9 & Energy East
 - Shipping by rail increasing across North America
 - **Renewable spending – small % of total capital?**
 - “No regulations” in Alberta
 - Economic & Social protests – Neil Young, Leonardo DiCaprio, Desmond Tutu
 - Etc, etc
 - Canadian navel gazing in media?
- SUNCOR**

Solar plane flies to Madrid Friday

Clean Transport - Jul 3, 2012


An experimental solar-powered aircraft will leave the Moroccan capital on Friday for Madrid on its return journey to its home port in Switzerland, Morocco's news agency MAP reported.

Strong winds grounded the Swiss-made Solar Impulse plane in Morocco on Tuesday, delaying its flight to Spain.

Related Research on ASDReports.com:
Energy Harvesting for Electric Vehicles 2012-2022

We are in the midst of a transition away from fossil fuels, but it will take a long time

Cf. 50 years horse → rails
60 years candles → gas



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IEA Report Predicts Solar Power Domination by 2050

Two reports released simultaneously last week by the International Energy Agency (IEA) say that by the year 2050 the world's most widely used energy source will be solar power.

Biofuels: US Navy moves ahead on biofuels plants.

Close

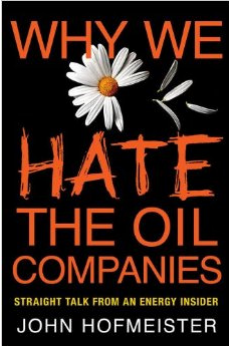
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Subject US Navy moves ahead on biofuels plants.

Body The Pentagon is pushing ahead with a \$420 million effort to build refineries to make competitively priced biofuels, despite anger in Congress over the price the Navy paid for alternative fuel to test a carrier strike group this month. The government plans provide \$210 million in matching funds to help firms build three refineries, each able to produce at least 10 million gallons of biofuel a year for military jets or ships, according to documents released this week. The Navy would supply \$170 million and the Energy Department \$40 million. The military's spending on alternative fuels has drawn criticism from Republican lawmakers, with Senator Jim Inhofe charging that President Barack Obama's priorities are "completely skewed" and Representative Mike Conaway accusing Navy Secretary Ray Mabus of "squandering precious dollars." But Mabus warns that U.S. dependence on foreign oil is a strategic vulnerability that can only be addressed by reducing the military's reliance on

Energy Literacy

- Low interest in energy matters (except NIMBY)
 - Regional vs. national
- Energy companies are not:
 - good at responding to reports
 - good at writing headlines
 - good at getting our "story" out
 - very credible





Same event – 2 different approaches



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You are here: Shell Canada Home > About Shell > Media Centre > News Releases > News Releases 2009

Oil sands protest ends peacefully

News and Media Releases

Oil sands protest ends peacefully

16 Sep 2009

(Fort McMurray, Alberta) – The Greenpeace protest at Shell’s Muskeg River Mine has ended peacefully with the activists departing at about 4:00 p.m. (MT). The mine continues to operate at full production with no business disruption.

A full audit of security procedures and processes is underway. Meanwhile security has been significantly increased.

“Shell has negotiated a safe resolution to the Greenpeace protest and they have left the mine,” said John Abbott, Shell’s Executive Vice President of Heavy Oil. “We hope in the future Greenpeace pursues opportunities for open dialogue and civil protest versus these types of illegal actions.”

“Shell has agreed not to pursue criminal charges against the protestors because it does nothing to further the climate change conversation. We rely on democratic processes to determine Canadian CO₂ policy and other important matters,” he said.

“We invited Greenpeace to discuss their climate and energy views with us directly but they chose not to do so, which is disappointing.”

Shell advocates for cap and trade emissions policies in Canada and around the world.

“Current and emerging regulations will drive us to reduce or offset greenhouse gas emissions (GHG) from oil sands production to a level on par with competing crude oil alternatives,” Abbott said. “That’s our goal.”

Recent independent studies show that fuel from oil sands today only produces 5% to 15% more CO₂ than conventional fuel – when measured from “well-to-wheel.” No one is working harder than Shell to close that gap.

Shell’s proposed Scotford Quest project would capture up to 1.1 million tonnes of CO₂ each year, which is equivalent to taking 175,000 North American vehicles off the road.*

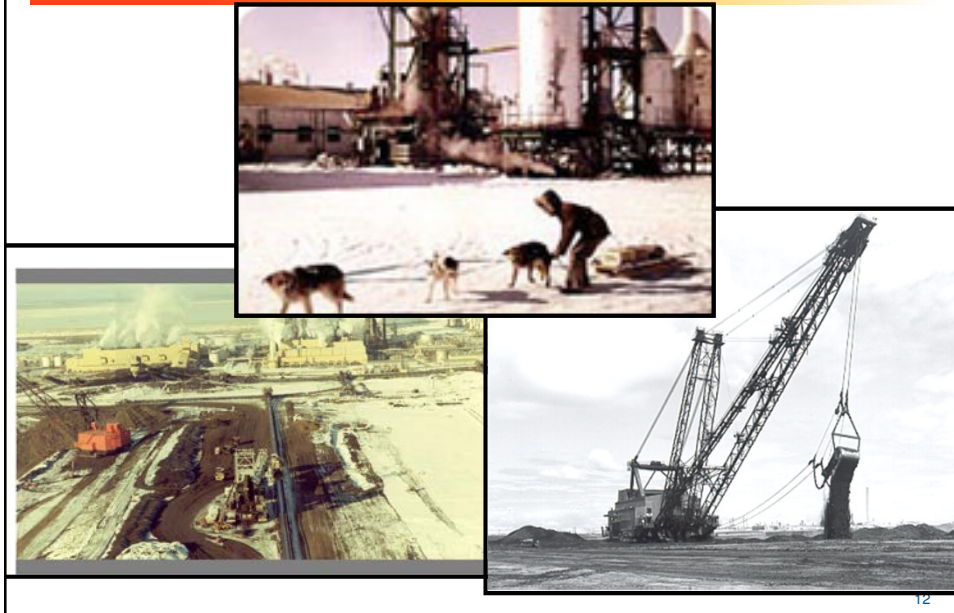
SUNCOR

Brief Overview of Suncor and Oil Sands

- Suncor Strategy and Operations
- Headlines vs The Full Story
 - Balanced perspectives
- Use sustainability as context



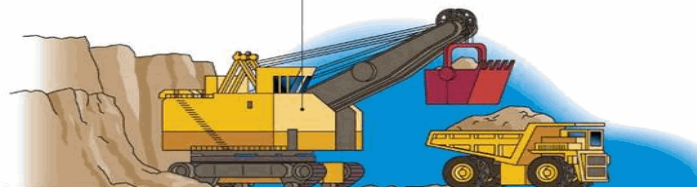
~ 48 years ago...the Oil Sands were viewed as a
technical and economic curiosity



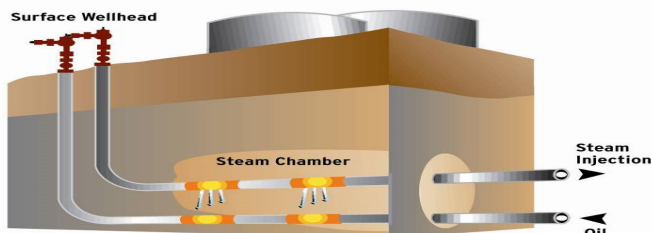
Oil Sands Production Methods

Mining (2% of area, 20% of resource)

Mining shovels dig into sand and load it into huge trucks.

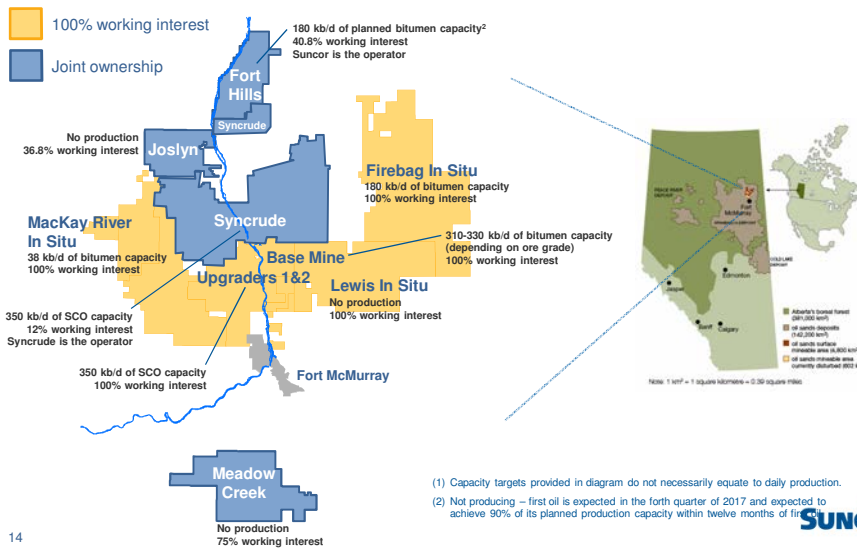


In Situ Example: Steam Assisted Gravity Drainage (80% of resource)



Suncor is Canada's Oil Sands leader

With a balanced portfolio of mining, in situ and upgrading¹



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Suncor's Value Chain








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<i>Mining</i>	<i>SAGD In-situ</i>
Ore is close to surface (<200 m)	Ore is deeper
Intensive land-use	Extensive land-use
High yield per disturbed hectare	Lower yield
High capital demands (\$12-16 B)	Lower capital (\$3-5 B)
Access to H ₂ O → 2-4 bbl/bbl	Approx 0.5 bbl/bbl
Land Disturbance & tailings ponds	Higher GHG per bbl; Cumulative effects




Comparing Typical Attributes of North American Oil Plays¹

	Tight Oil	SAGD	Mining	Offshore
Initial Capital	Low	Medium	High	High
Reinvestment Cycle	Short	Medium	Ultra long	Medium
Operating Costs	Low	Medium	High	Medium
Production	Light oil	Bitumen	Bitumen	Light oil
Reservoir Risk	High	Medium	Low	High
Recovery Factor	Low	High	Very High	Medium
Decline Rate	Very high	Medium	Low	High
Other Considerations	Land acquisition costs	Cyclical pad development	No longer need on-site upgrading	Exploration risk
Suncor Exposure	0%	~35%	~45%	~20%

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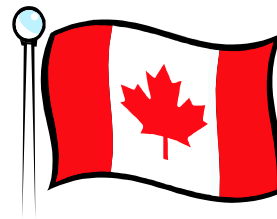
(1) Attributes are generalizations based on Suncor's analysis of its own projects, competitor projects, and industry research.



And now for some industry data

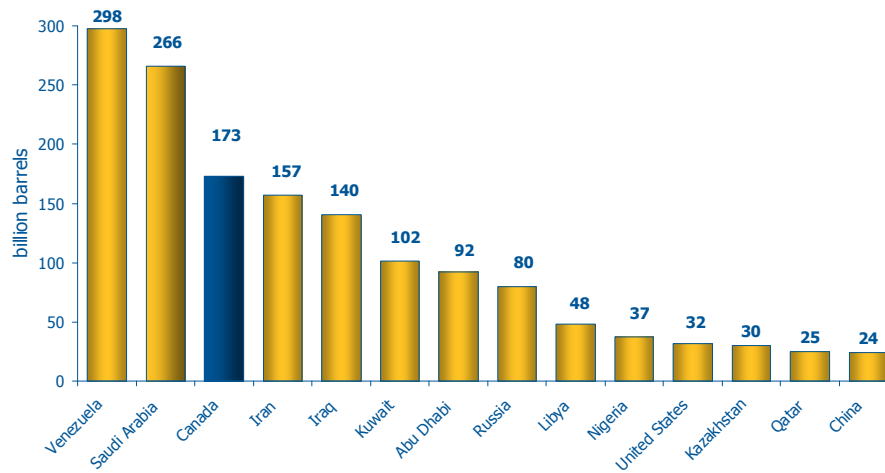
A look at rankings

- We are Number 1 in Hockey
- We are Number 1 in Curling
- We are number 1 in Maple Syrup
- We are number 1 in Donut shops/capita
- And



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Oil Sands: a significant resource



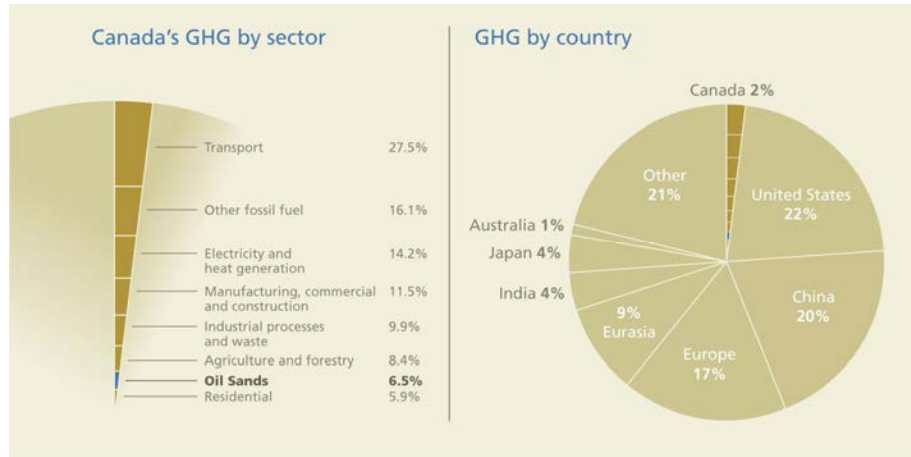
Source: Oil & Gas Journal Dec. 2013

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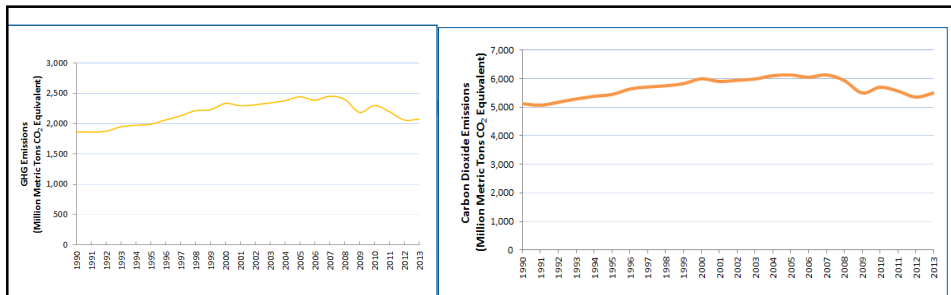
The Alberta oilsands contain total reserves of between 1.7 and 2.5 trillion barrels of crude bitumen. Approx. 172.3 billion barrels can be recovered using current technology.



Oil Sands vs. global GHG emissions

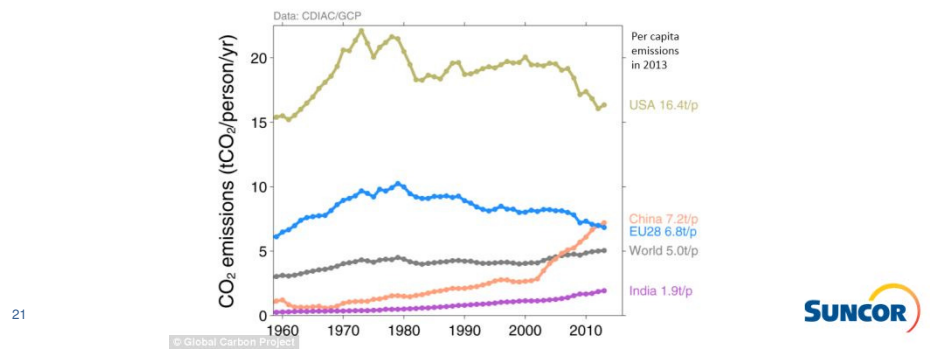


Source: Environment Canada, 2011



US Coal

US Total emissions



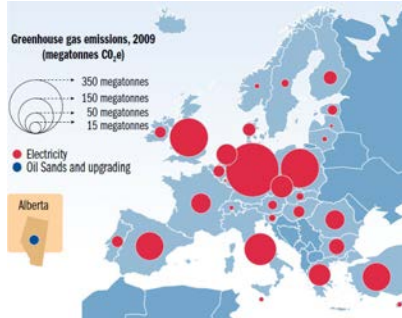
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© Global Carbon Project



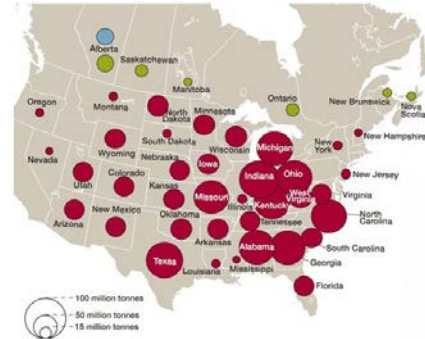
Relative GHG performance – all countries have an impact

EU Power Generation vs. Oil Sands GHG Emissions



(1) The area of each circle is proportional to the jurisdiction's greenhouse gas (GHG) emissions. The circles of the two maps are comparable.
 (2) Sources: Canadian Ministry of the Environment; European Environment Agency. Graphic reproduced from Natural Resources Canada.

US Coal-fired Generation vs. Oil Sands GHG Emissions

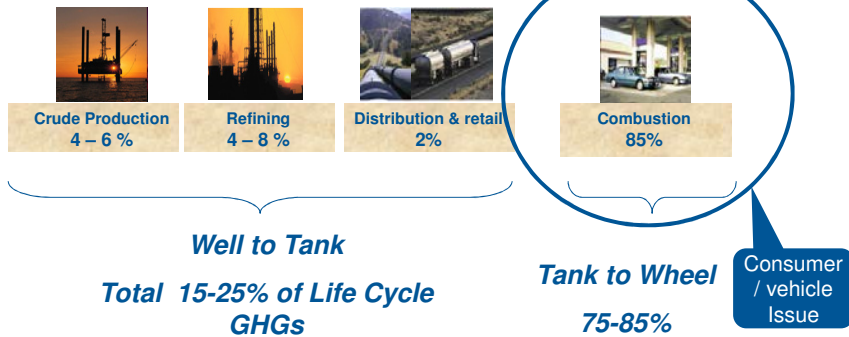


(1) Sources: U.S. Department of Energy (Energy Information Agency) and Environment Canada.



GHG emissions from life-cycle perspective

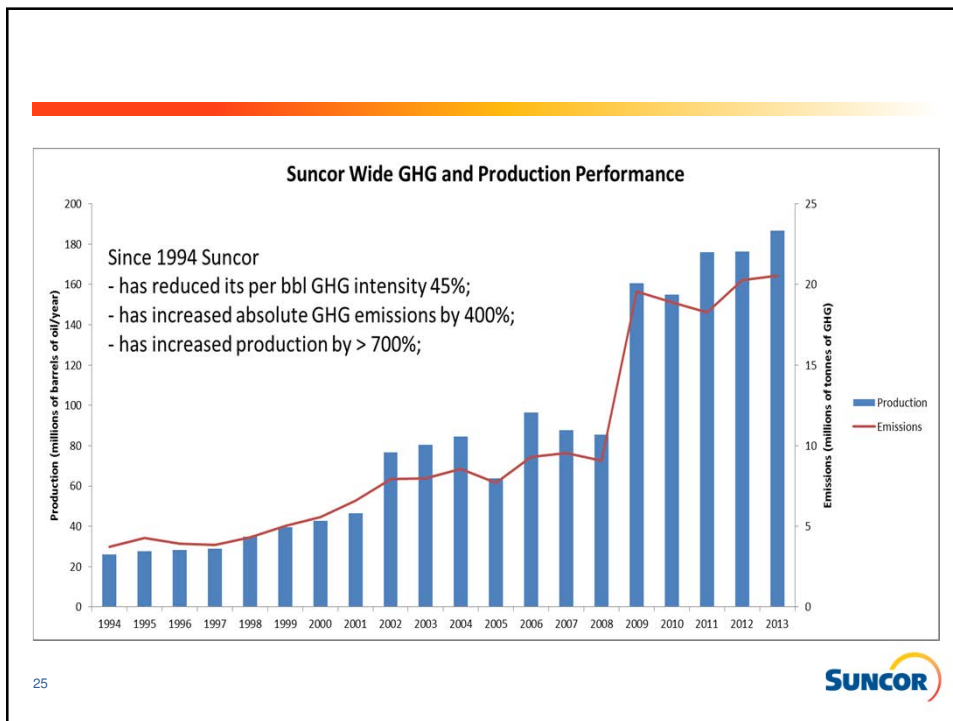
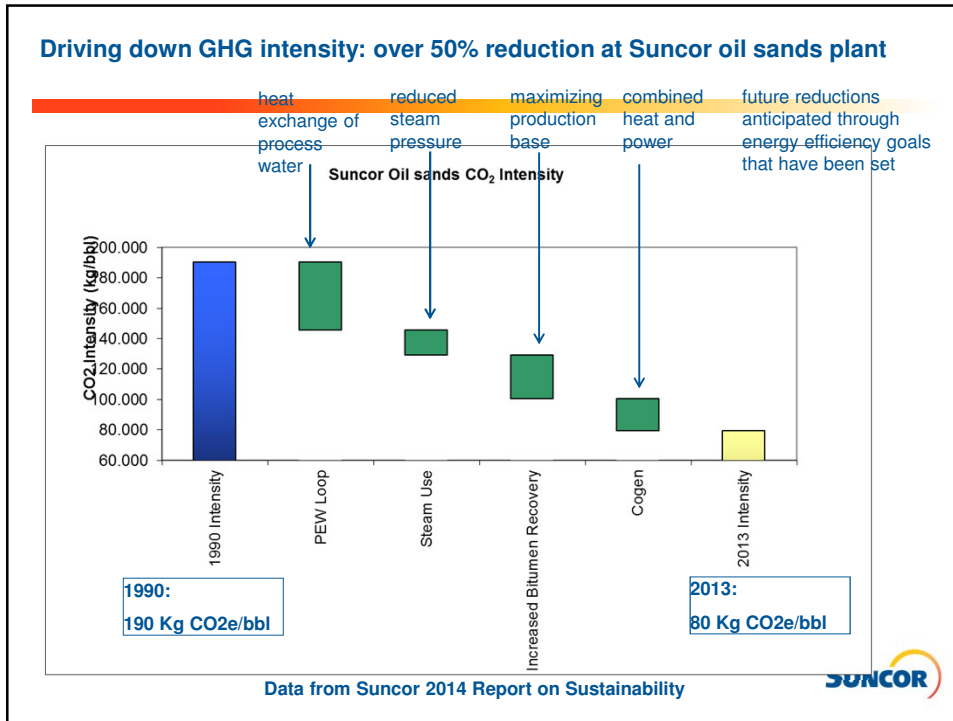
Headline: A barrel of synthetic crude oil leads to at least 300% higher emissions compared to a conventional barrel of oil



The largest emissions from a barrel is the fuel combustion in the vehicle (about 75-85%)

*Adapted from Imperial Oil



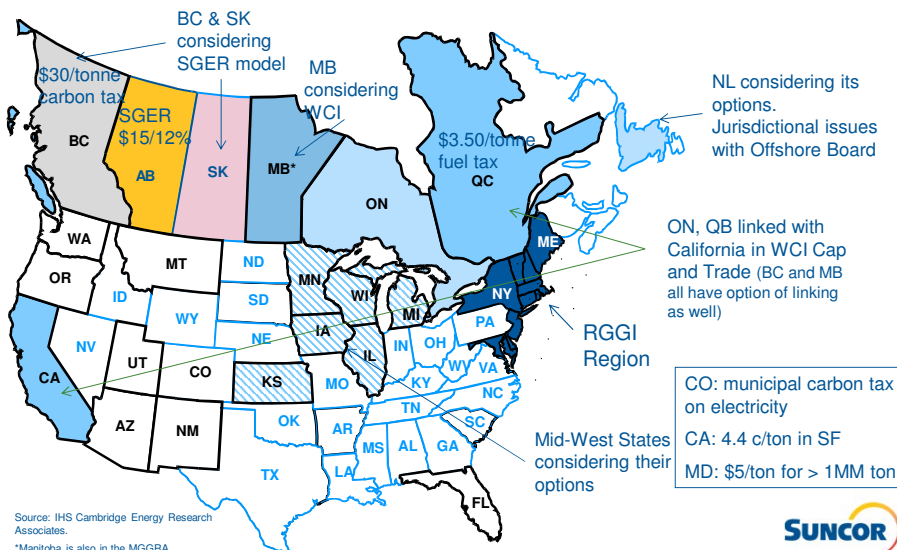


Regulations

- *Headline: Alberta is the Wild West - there are no environmental regulations or controls on oil sands development.*
- **Alberta introduced first carbon tax on large emitters in 2007 (\$15/t)**
- Regulatory agencies involved
 - Federal: Environment Canada; DFO
 - Provincial: ESRD; Energy; Alberta Energy Regulator
 - Monitoring: JOSM; AEMERA
- Suncor uses a proprietary regulatory tool to track and ensure compliance.
- Approx. 900-1000 “reports” per year for Oil Sands mining and about 900 “report” for In Situ.
 - “report” can involve monthly / quarterly / annual reports or submissions.



A patchwork view of Climate Change policy and regulations



Land Disturbance

- *Headline: An area the size of the state of Florida (149,000 km²) can be leased to oil sands development in the future.*
 - Mineable resource covers about 3,400 km²
 - Approx 825 km² has been disturbed since 1967 (about the size of Edmonton or Lexington, KY)
 - Approx 90,000 km² of Alberta boreal forest are protected.
 - Suncor is a member of the Boreal Leadership Council, committed to protecting 50% of the Canadian Boreal Forest



Suncor's Track Record

- Approach towards Sustainability
- Reporting
- Our goals and targets



Suncor Environmental Performance Goals



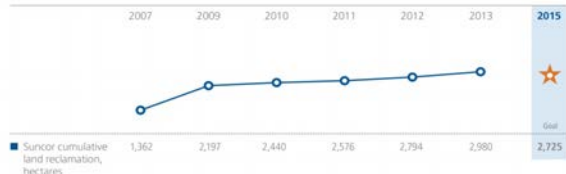
2013 Report on sustainability

Indicator	Environmental performance goal*
Water	Reduce fresh water consumption by 12% by 2015
Land	Increase reclamation of disturbed land area by 100% by 2015
Energy efficiency**	Improve energy efficiency by 10% by 2015
Air	Reduce air emissions by 10% by 2015

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LAND GOAL* INCREASE RECLAMATION OF DISTURBED LAND AREA BY 100% BY 2015 (hectares reclaimed)



* Land goal performance metrics include total land reclamation at operated sites in Oil Sands, North America Onshore and In Situ (including exploration areas (OSE)).
2007 baseline is the sum of cumulative reclamation at Oil Sands, and North America Onshore reclamation certificates received in 2007, and cumulative In Situ (including OSE) reclamation certificates received from 2005 to 2007.
Land reclamation credit for OSE and North America Onshore reclamation certificates is taken for the year in which the certificates are received, not necessarily the year reclamation activities were completed.

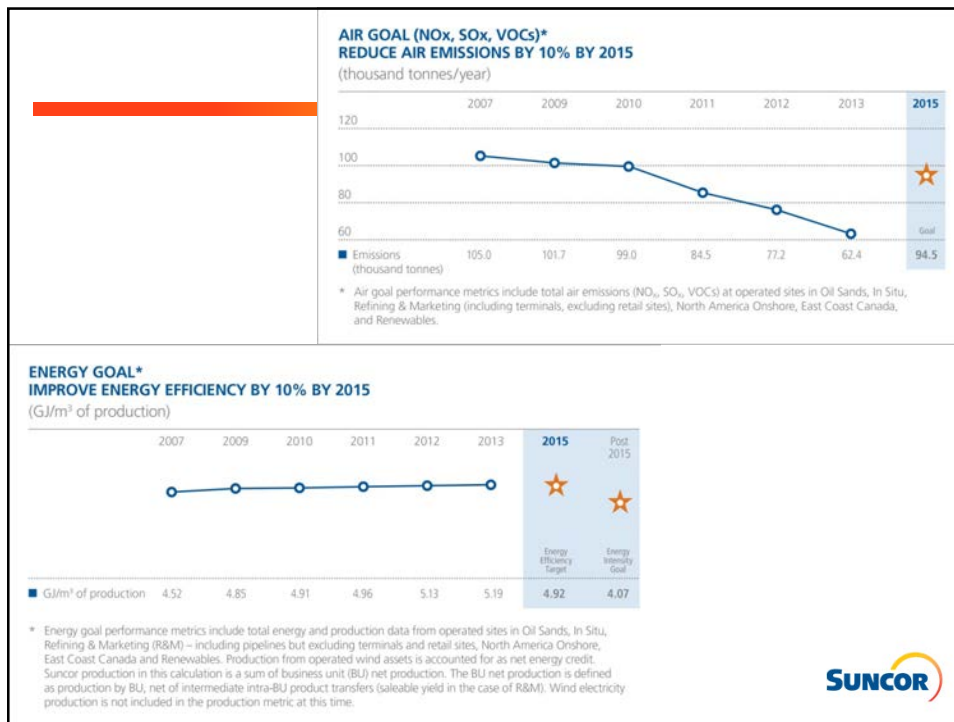
WATER GOAL* REDUCE FRESHWATER CONSUMPTION BY 12% BY 2015 (million m³ freshwater consumed)



20% growth in prod'n since 2009

* Water goal performance metrics include total freshwater consumption at operated sites in Oil Sands, In Situ, Refining & Marketing (excluding terminals and retail sites), North America Onshore, East Coast Canada, and Renewables.







Oil Sands and Divestment

US town opens new front in oil sands battle

By GEOFF DEMBICKI
 Published June 8, 2010 04:00 pm | 11 Comments

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Councillors in Bellingham, Washington, voted unanimously Monday evening to phase out fuel from the Alberta oil sands. It's the first city in North America to directly target the often-maligned industry, according to green observers.

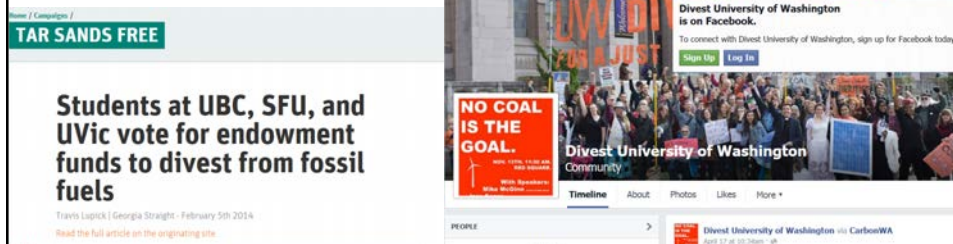
"Global warming pollution from fossil fuel use could have severe economic and environmental impacts on U.S. cities in coming decades," reads a draft resolution. "High carbon fuels such as those derived from Canada's Tar Sands [generate] at least three times more global warming pollution than the well-to-tank phase of other fossil fuels."

The initiative isn't an outright ban. It calls on Bellingham officials to avoid procuring high carbon fuel for the city's transportation fleet, whenever possible. Four nearby refineries process Alberta bitumen, a gooey fuel that's either mined or steamed from sensitive Boreal forest.



Fossil Fuel Divestment and Stranded Assets

- 350.org led by author Bill McKibben, Fossil Free is a campaign which encourages campuses to divest from all fossil fuels from endowments and pensions funds.
- The genesis of the campaign is based on frustration with slow progress on climate change action.
- Critics of the campus fossil fuel divestment campaigns suggest that there are more effective ways for colleges and universities to address climate change
 - focus on create and share knowledge.
- Worth considering that almost 85% of the world's oil reserves are controlled by national oil companies that are almost entirely immune to the threat of divestment.
- Fundamental to contributing constructively to the climate change debate is knowledge, specifically an understanding of where energy comes from now and how we'll meet our energy needs in the future.



4. Technology is fundamental to how we do business

\$175 mm budgeted in 2014 on R&D spending, targeting higher production, enhanced profitability and lower environmental impacts



TRO_{TM}: Tailings Reduction Operations
 Wapisiw: First oil sands tailing pond to be reclaimed
 SENTRON: High performance natural gas engine oil
 ESPs: Electric Submersible Pumps
 SAGD LITE: Steam Assisted Gravity Drainage Less Intensive Technology Enhanced (with surfactants)
 ESEIEH: Enhanced Solvent Extraction Incorporating Electromagnetic Heating
 DCSG: Direct Contact Steam Generation



5. Closing of Suncor's Pond 1



- British Columbia \$338,185,902 711 vendors
- US total spend \$135 MM Oil Sands / \$745 MM Corporate
- Washington 24 vendors
- Oregon 8 vendors
- Idaho 5 vendors
- Montana 8 vendors

Marine Traffic Statistics

- Port of Vancouver oil tanker traffic
- Between 2005-2011, oil tankers accounted for 1.5% of all foreign vessel traffic.
 - In 2011, 32 oil tankers called on Port Metro Vancouver
 - In 2012, 50 crude oil tankers called on Port Metro Vancouver (2% of foreign vessel traffic)
- Currently, there are about 100 crude oil and chemical tankers calling the port each year.
 - If Kinder Morgan expansion receives approval, that number could increase to approximately 400 tankers a year.
 - Compare with Rotterdam handles 8,206 tankers a year, while Singapore handle 22,280 tankers a year.
- According to the Washington Research Council, approximately 600 oil tankers and 3000 oil barges travel through Puget Sound each year.

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