



# Choosing the clean path for Fueling our Transportation Future: Why we can't afford to expand high carbon fuels

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Please see NRDC's site: [www.stopdirtyfuels.org](http://www.stopdirtyfuels.org) for  
our publications and my comments which are posted  
at <http://switchboard.nrdc.org/blogs/lizbb>



Photo source: Pembina Institute , Canada's Athabasca region

# Points to consider

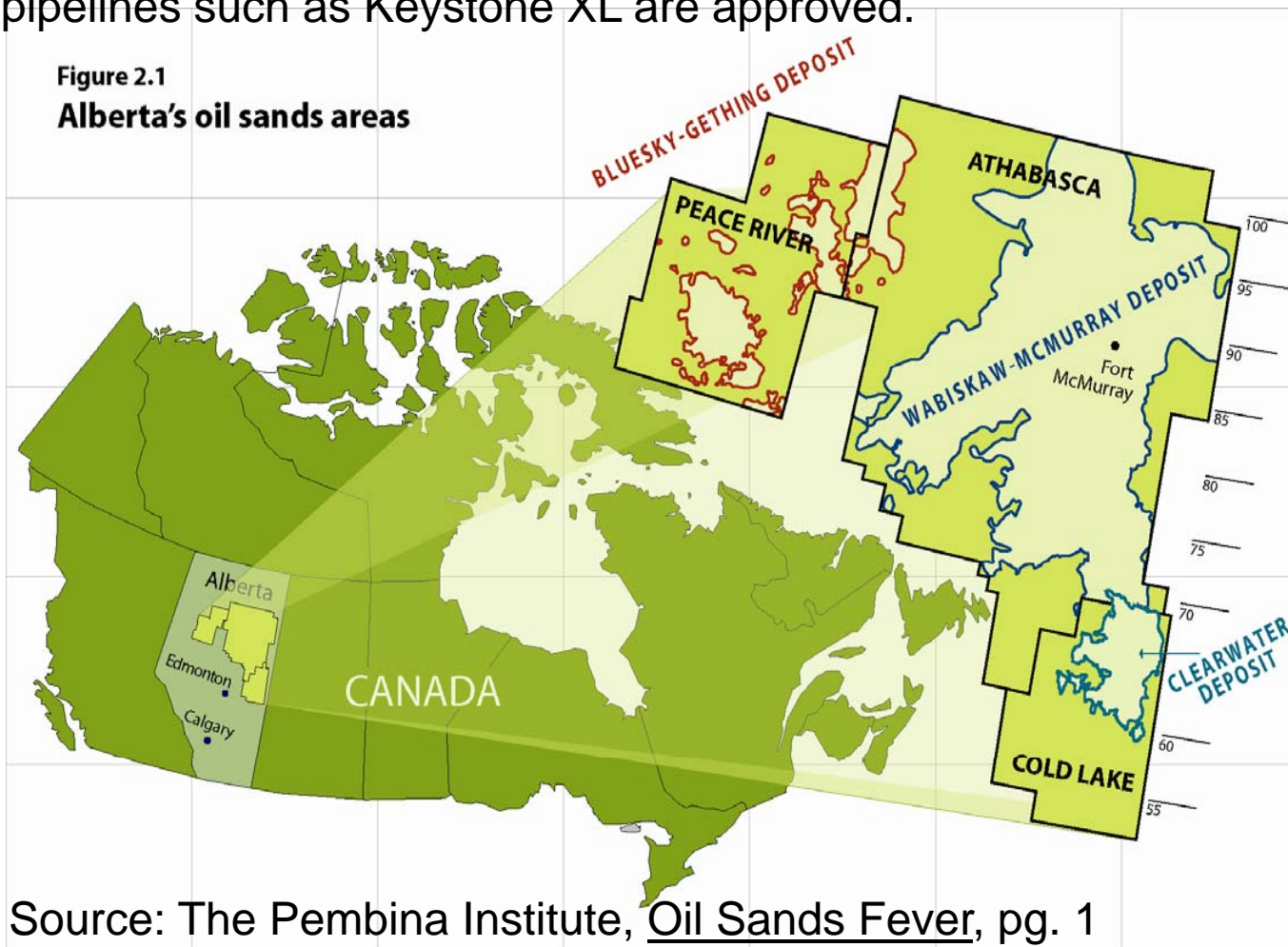
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- The trade-offs in producing high carbon fuels, such as tar sands, oil shale and liquid coal, are too high to justify their benefits. There are better solutions than to pursue environmentally destructive fuels.
- Production and combustion of high carbon fuels will undermine efforts to reduce carbon emissions by 80% by 2050. Policies to reduce our dependence on oil and cut emissions should be of highest priority, on national security and economic as well as environmental grounds.
- Dependence on high carbon fuels undercuts our ability to adopt critically important policies, such as Low Carbon Fuel Standards, and to encourage other countries to do the same.

# Large tar sand deposits can be mined for heavy oil but at significant environmental costs

- U.S. imports about 800,000 barrels per day in bitumen and upgraded synthetic crude oil. This could double or triple in the coming decade if pipelines such as Keystone XL are approved.

Figure 2.1  
Alberta's oil sands areas



Source: The Pembina Institute, Oil Sands Fever, pg. 1



# Canadian tar sands are extracted by strip mining or by drilling using steam

Quartz sand, silt and clay, water and bitumen. Also, minor amounts of mineral, titanium, zirconium, tourmaline and pyrite

Typical composition:

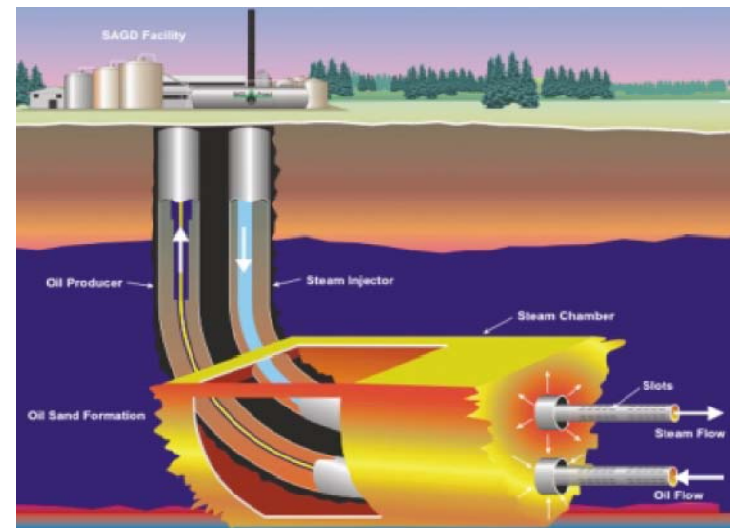
75 – 80%  
inorganic material  
(90% quartz sand)  
3 – 5% water  
10 – 12% bitumen



## Surface Mining



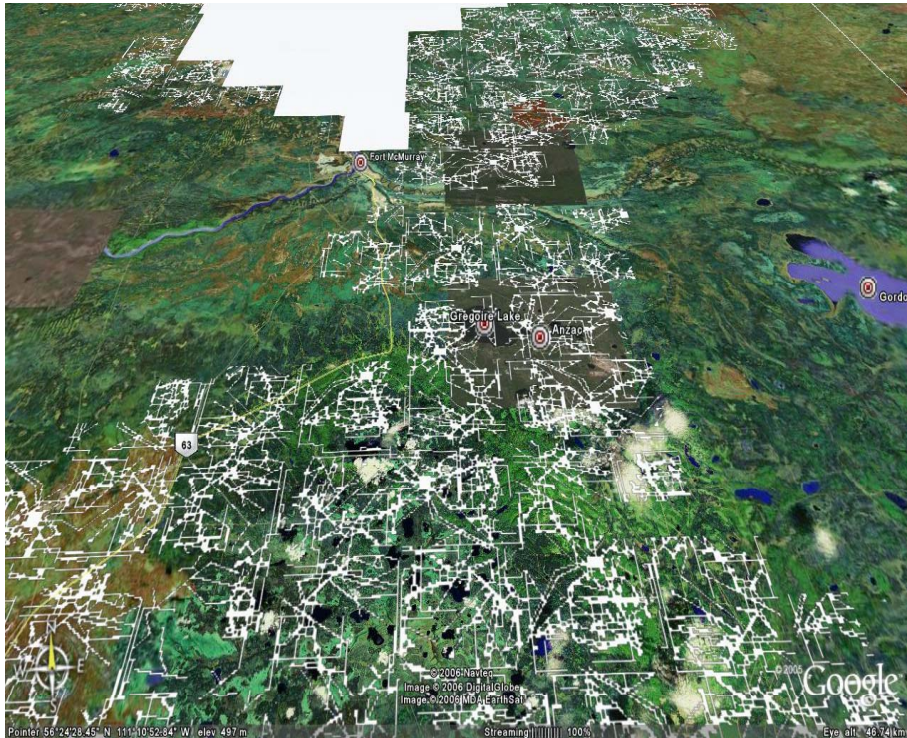
## In-Situ Drilling



Sources: Figures from Bengt Soderbergh, Presentation 5/23/2005, Uppsala University, Pembina Institute; and Indigenous Environmental Network



# Land use impacts from open pit mines and in-situ production methods are enormous



Source: The Pembina Institute (left) and WWF (right). The in-situ is an extrapolation of what the area south of Ft. McMurray would look like if all approved projects go forward.

Tar sands tailings waste ponds are among the largest in the world, with serious human and wildlife toxicity impacts (especially on migratory birds)



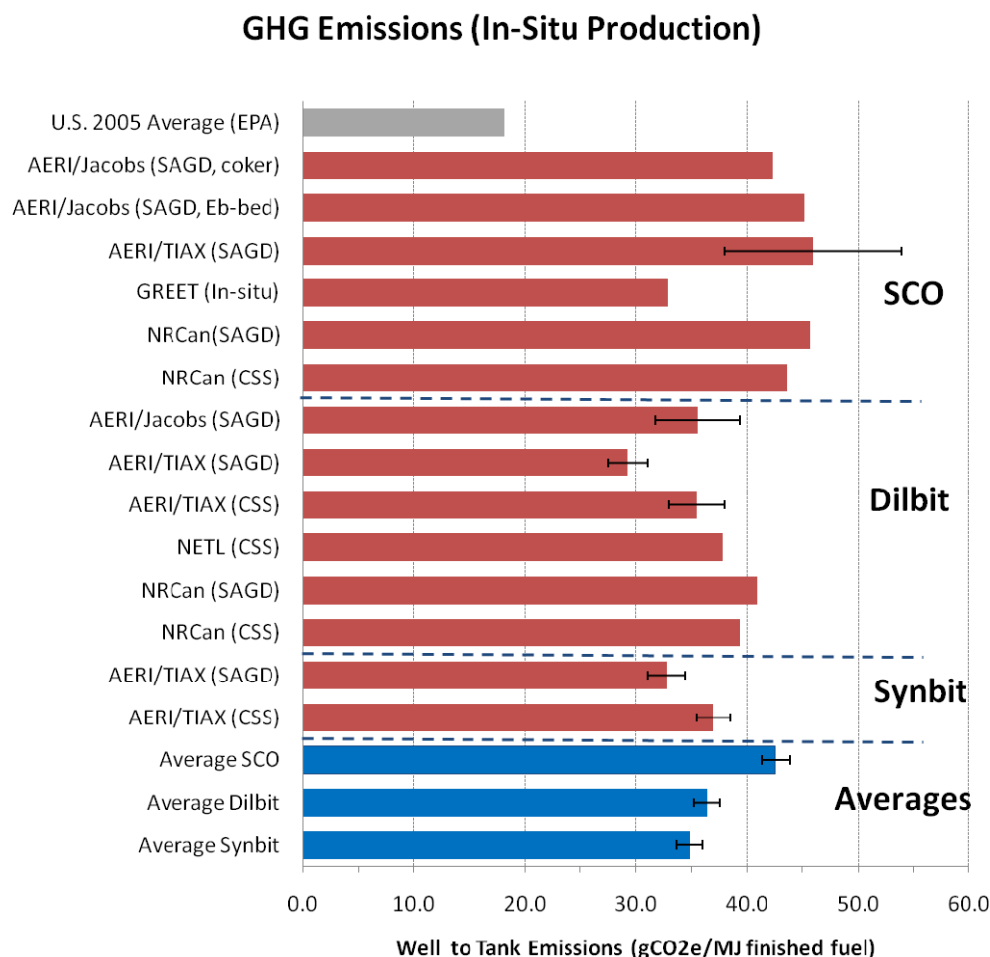
Yesterday, NRDC filed a NAFTA CEC petition with ED Canada and affected citizens regarding lack of enforcement of Canada's federal Fisheries Act(<http://www.environmentaldefence.ca/reports/CECsubmissionTarSands.pdf>)



# Lifecycle greenhouse gas emissions for in situ production are 8-37% greater compared to the U.S. 2005 gasoline baseline



- 93% of tar sands oil will be extracted by in situ mining.
- A number of studies have been conducted based on both current operations or future operations with most studies estimating between 8 to 37% increased emissions on a well-to-wheel basis (specific value dependent on the mining or in-situ production process).<sup>\*</sup> Upstream or well-to-tank emissions are shown.
- Loss of soil and biogenic carbon have not been included and can increase this value

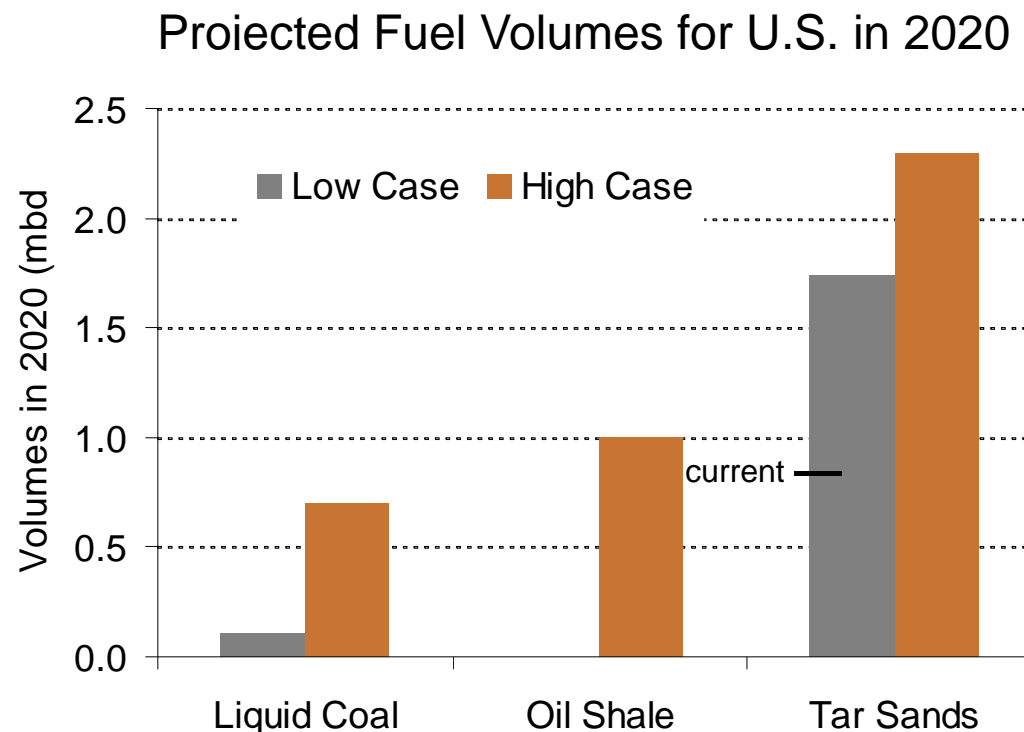


<sup>\*</sup> NRDC (2010), *GHG Emission Factors for High Carbon Intensity Crude Oils*.

# High Carbon Fuels Undermine Efforts to Reduce GHG Emissions



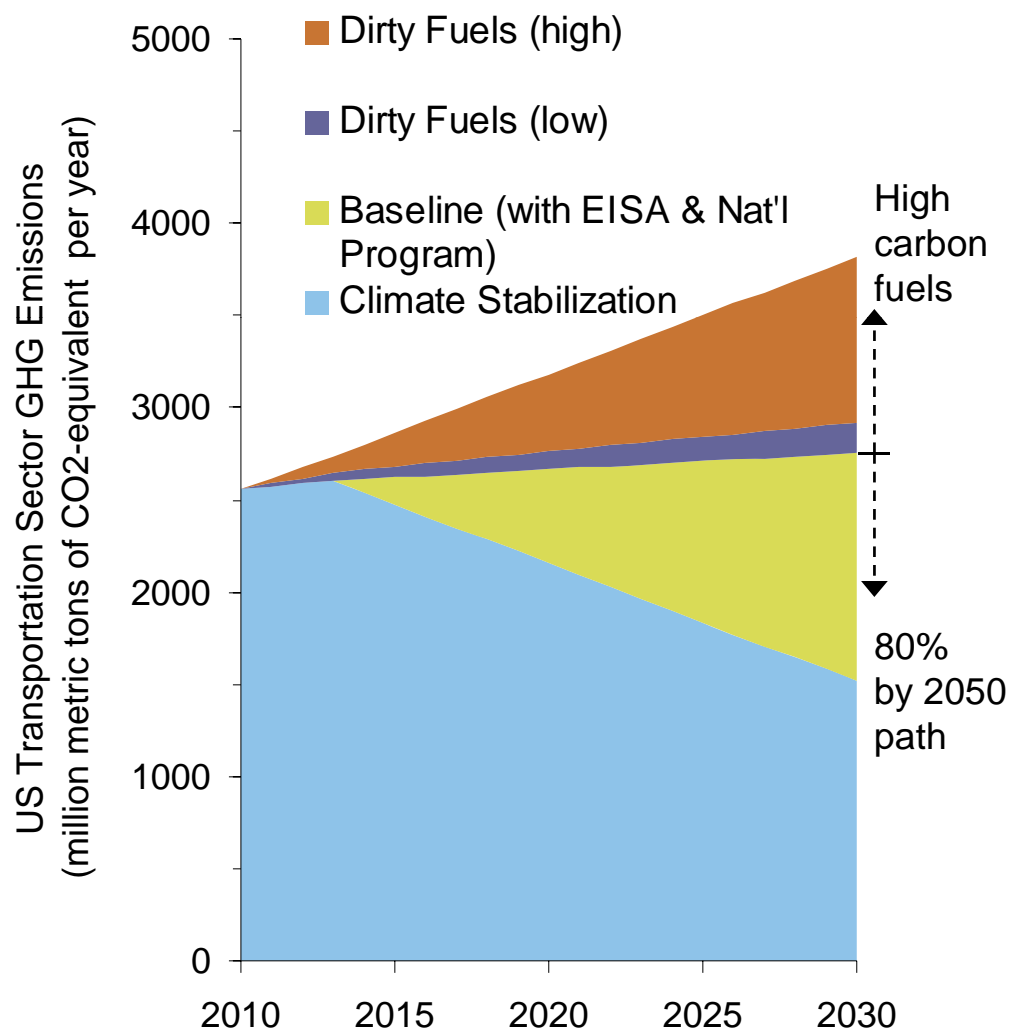
Increased development of marginal, unconventional sources of crude oil (tar sands, oil shale, and coal to liquids) threatens to offset the benefits of clean energy efforts



Data sources: Low: AEO 2009 reference case, Canadian Pembina Institute (tar sands); High: RAND studies, CAPP (tar sands)



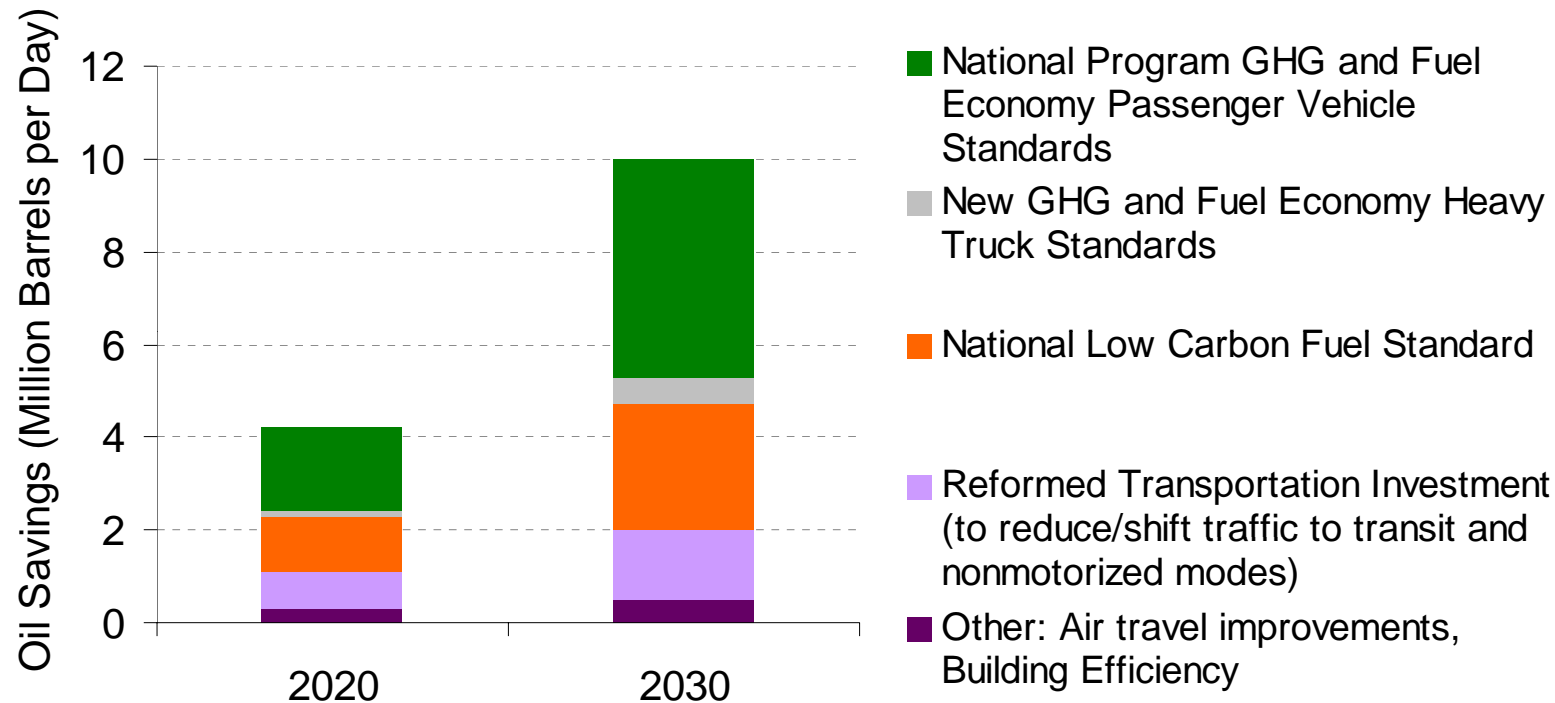
# High Carbon Fuels could make reaching an 80% reduction in transportation emissions impossible



Wedges based on NRDC analysis

- Because of high carbon fuels, by 2030, transportation sector emissions could rise 6-33% over baseline.
- Carbon dioxide reductions from national GHG and fuel efficiency standards could be significantly offset by additional production emissions from tar sands and other high carbon fuels (oil shale and liquid coal)
- Investments in facilities and pipelines for high carbon fuels create “carbon lock in.”

# Energy security is best achieved through reducing oil dependency and limiting use of high carbon fuels



Upon entering office, President Obama pledged to eliminate the equivalent of 3.3 mbd in 10 years. The Administration should adopt a comprehensive oil savings plan as should other countries in the hemisphere. According to EPA, the Administration's light duty GHG and fuel efficiency standards will save 1.8 mbd over the lifetime of the regulated vehicles.

# Policy Roadmap for Addressing Transportation Sector Emissions

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## 1. Transportation Fuels In Economy Wide Caps

## 2. Complementary Performance Standards

- In U.S., national auto standards complemented by California Clean Cars Law
- **Low Carbon Fuels Standards**
- Reformed Transportation Investments (reducing the need to drive)

## 3. No exemptions and subsidies for production of high carbon fuels

## 4. Stimulate markets for low carbon fuels

- R&D investments, financial incentives
- Retooling and manufacturing investments
- Consumer and fleet incentives for lowest emission vehicles
- Dedicated funding for priority transit projects, incentives to reform land use and transportation



# What is a “Low Carbon Fuel Standard”?

- On April 23, 2009, the California Air Resources Board adopted the nation’s first greenhouse gas pollution standard for fuels.
- Goal is to ensure fuel providers contribute to meeting California’s 2020 GHG reduction goal set by state law (AB32, the Global Warming Solutions Act).
- CA LCFS will require refiners and importers of gasoline and diesel fuel to gradually reducing the carbon-intensity of their fuel pool by 10% by 2020.
- Other regions considering a LCFS include Oregon, Northeast and Mid-Atlantic States, Midwest States, EU, and Canadian provinces.



# The LCFS provides maximum flexibility for fuel providers

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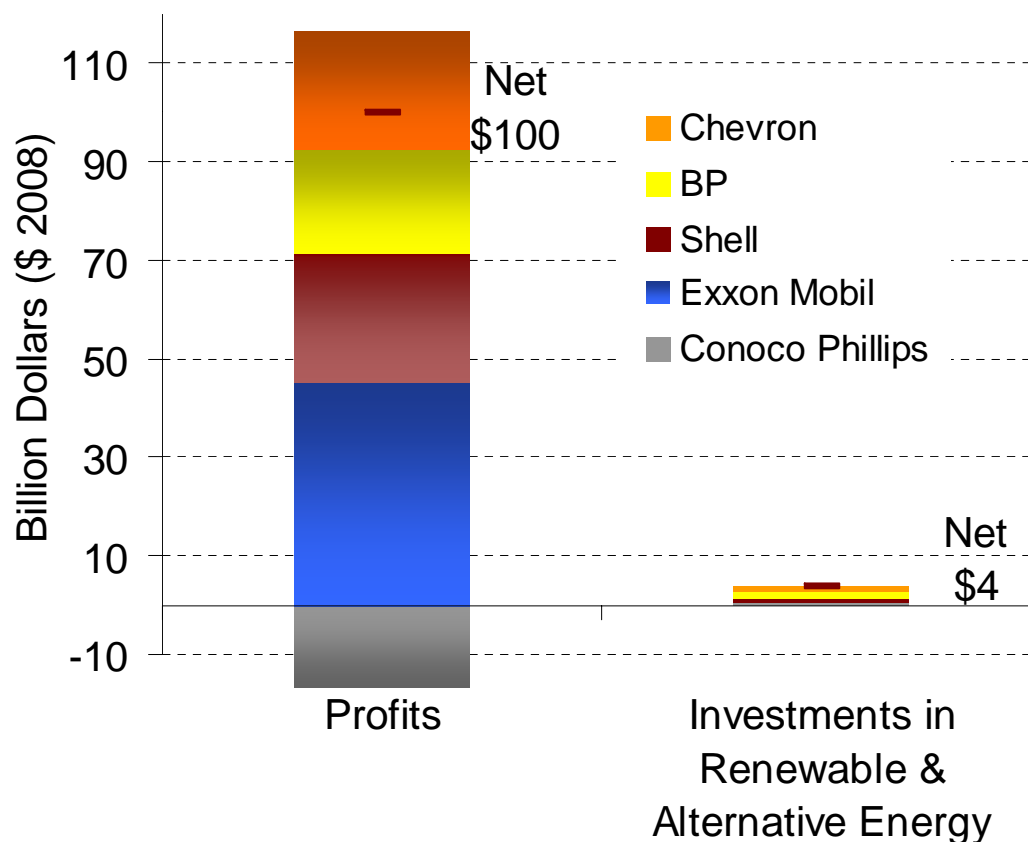


- Performance-based, fuel neutral approach ensures maximum compliance flexibility and maximum incentives for innovation
  - Eg: Investors and producers can achieve more value for their fuel through practices that result in a better carbon intensity score
- Multiple options to meet the performance standards
  - Reduce the carbon intensity of their production process (e.g. CCS, efficiency, fuel switching)
  - Blend or sell a mix of fuels with a carbon intensity equal to the standard
  - Purchase LCFS credits from fuel providers who exceeded the standard
  - Use banked LCFS credits from previous years

# Policies – like the LCFS – can spur important investments in cleaner fuels and energy production



## Top 5 Oil Company Profits in 2008 Compared to Investments in Renewable and Alternative Energy



Data Source: Center for American Progress (2009)



# Additional references

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## ***Impact of Canadian tar sands is enormous:***

- Environmental Defence Canada “The Most Destructive Project on Earth” ([http://www.environmentaldefence.ca/reports/pdf/TarSands\\_TheReport.pdf](http://www.environmentaldefence.ca/reports/pdf/TarSands_TheReport.pdf))
- Pembina fact sheet “Oil Sands Myths” (<http://pubs.pembina.org/reports/oilsandsmyths-slideshow.pdf>)

## ***Canadian environmental and climate policies are undermined by tar sands growth***

- Environmental Defence Canada report “Just Visiting – Stephen Harper’s climate insincerity” ([http://www.environmentaldefence.ca/reports/pdf/JustVisiting\\_FINAL.pdf](http://www.environmentaldefence.ca/reports/pdf/JustVisiting_FINAL.pdf))
- Pembina Institute press release about weakening the Environmental Assessment process (<http://www.oilsandswatch.org/media-release/1989>)
- Pembina Institute report for Copenhagen, outlining Canada’s positions (<http://pubs.pembina.org/reports/cop15-briefing-note-final-dec-2.pdf>)

## ***Canada is being outspent by the U.S. 18:1 on renewable and 8:1 on clean energy***

- Pembina Institute (<http://climate.pembina.org/pub/1979>)

## ***In situ mining is an unproven technology and has potentially large environmental and climate impacts***

- NRDC report “Danger in the Nursery – Impact of tar sands development in Canada’s Boreal on Birds” (<http://www.nrdc.org/wildlife/borealbirds.asp>)
- Pembina report “Drilling Deeper – the in situ oil sands report card” (<http://pubs.pembina.org/reports/in-situ-report-card.pdf>)
- RPSenergy report (<http://trc.jogmec.go.jp/pdf/20091002/1.pdf>)

## ***CCS faces many technological and economic challenges in the tar sands***

- World Wildlife Fund-U.K.’s report “Carbon Capture and Storage in the Alberta Oil Sands – a Dangerous Myth” (<http://www.co-operative.coop/Corporate/PDFs/Tar%20Sands%20CCS.pdf>) Summary is here: <http://www.carboncapturejournal.com/displaynews.php?NewsID=47>
- Canada’s Fossil Energy Future: The Way Forward on Carbon Capture and Storage ([http://www.energy.alberta.ca/Org/pdfs/Fossil\\_energy\\_e.pdf](http://www.energy.alberta.ca/Org/pdfs/Fossil_energy_e.pdf))

## ***The waste tailings ponds and land impacts are causing downstream toxicity concerns and are a hazard to public health and wildlife***

- Environmental Defence “11 Million Litres a Day – The Tar Sands Leaking Legacy” ([http://www.environmentaldefence.ca/reports/pdf/TailingsReport\\_FinalDec8.pdf](http://www.environmentaldefence.ca/reports/pdf/TailingsReport_FinalDec8.pdf))
- Pembina fact sheet on tailings directive 074 (<http://pubs.pembina.org/reports/tailings-directive-074-backgroundunder.pdf>)

**Please see NRDC’s site: [www.stopdirtyfuels.org](http://www.stopdirtyfuels.org) for our publications and my comments which are posted on my blog at <http://switchboard.nrdc.org/blogs/lizbb/>**