Does the World Need Oil from the Tar Sands?

To successfully combat climate change, we urgently need a revolution in the way we produce, consume, and distribute energy. These changes will eliminate the market for dirty oil from the tar sands.

GREENPEACE

www.greenpeace.ca

New scenarios for our energy future show that as the world moves toward green energy, global demand for oil will decrease and oil from unconventional sources like the Canadian tar sands will become both unnecessary and uneconomic.

The Energy [R]evolution report from Greenpeace and the European Renewable Energy Council provides a practical blueprint for the world's renewable energy future. It was developed in conjunction with specialists from the Institute of Technical Thermodynamics at the German Aerospace Centre (DLR) and more than 30 scientists and engineers from universities, institutes and the renewable energy industry around the world.

The report demonstrates how the world can get from where we are now, to where we need to be in terms of phasing out fossil fuels and cutting greenhouse gas emissions, while ensuring energy security and creating millions of new green jobs.

Unconventional Oil: Squeezing the Planet for the Last Drop

"It is still feasible to stabilize climate, but only if we leave the tar sands in the ground. The massive greenhouse gas amounts from the tar sands surely would cause the climate system to pass tipping points, while also trampling on the human rights of Canada's First Nation communities and greatly damaging the Canadian boreal forest.... The world has reached a critical juncture in the climate debate. We can either move into the production of the most damaging fossil fuel, or we can begin to address our destructive addiction." — *Climate Scientist Dr. James Hansen, May 18, 2010*

The need for a fossil fuel phase out is perhaps clearest in contrast to the accumulating evidence of the harm from the reckless pursuit of unconventional oil, whether by digging ever-deeper holes in the Canadian tar sands or drilling ever-deeper beneath ocean. This is why, as we exit the era of cheap and easily-accessible fossil fuels, we need to carefully examine the oil industry's claim that we can't do without these risky, expensive and harmful-to-extract resources.

Companies like BP have been responding to criticism of their ventures into unconventional oil by citing projected future energy needs from the International Energy Agency's (IEA) 2009 *World Energy Outlook*.[1] The IEA's 2009 *World Energy Outlook* did indeed include a business-as-usual Reference Scenario where the output from the Canadian oil sands tripled over the next 20 years. This scenario was, however, described as one which had "alarming consequences for climate change and energy security." According to the IEA, the possible future that included such a rapid expansion of the oil sands "takes us inexorably towards a long-term concentration of greenhouse gases in the atmosphere in excess of 1,000 parts per million CO_2 equivalent. The CO_2 concentration implied by the Reference Scenario would result in the global average temperature rising by up to 6 degrees Celsius. This would lead almost certainly to massive climatic change and irreparable damage to the planet."[2]

The IEA's Reference Scenario that is being used as justification for expanding tar sands operations was there as what the IEA Executive Director labeled a "caution."[3] The IEA was actually advocating for what they called a "low-carbon energy revolution", which the report claimed would have a 50 per cent chance of keeping the increase in global temperatures to below 2 degrees Celsius above pre-industrial levels[4], the stated aim of the Copenhagen Accord that came out of the climate change summit in December 2009.

The IEA notes that their low carbon scenario would also dramatically cut air pollution and reduce fuel costs in the transport sector by $6.2 trillion over the 2010 – 2030 period, helping to pay for the cost of making the change.

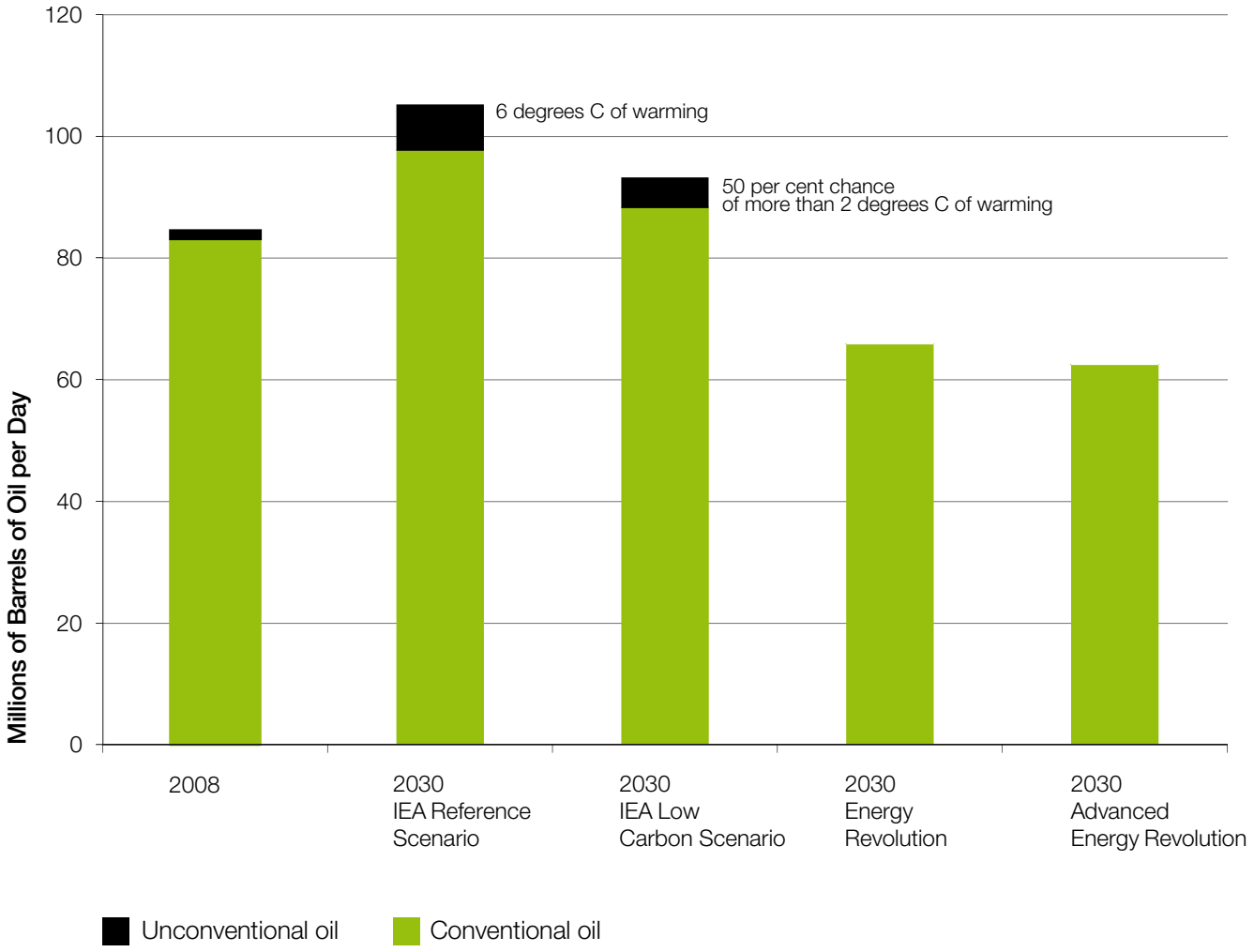
The only real loser would be the corporations who bet big on Canada's tar sands, as they are first up on the chopping block. The IEA report found that the high capital costs of Canadian oil sands projects meant that they accounted for over 85 per cent of all of the upstream oil and gas projects in the world that were cancelled or pushed back by at least 18 months globally in response to the recent economic recession.[5] And efforts to reduce greenhouse gas emissions in the IEA's Low Carbon scenario would reduce the global growth of unconventional oil by 44 per cent, "with Canadian oil sands particularly heavily affected".[6]

Even this, however, is a very risky strategy with respect to protecting human and natural communities from dangerous levels of global warming. In order to avoid the most catastrophic impacts of climate change, we must keep the global temperature increase as far below 2°C as possible rather than gamble on a 50/50 chance of missing this upper limit. The latest science shows that a warming of 2°C above pre-industrial levels would pose unacceptable risks to many of the world's key natural and human systems.[7] Even with a 1.5°C warming, increases in drought, heat waves and floods, along with other adverse impacts such as increased water stress for up to 1.7 billion people, wildfire frequency and flood risks, are projected in many regions. Neither does staying below 2°C rule out large scale disasters such as melting ice sheets.[8]

1 See, for example, the response of BP to the question "Does the world need oil from the oil sands" on page 12 of their *Operating at the Energy Frontiers: Sustainability Review 2009*, which explicitly cites the IEA's Reference Scenario.

2 IEA, World Energy Outlook 2009, page 44.
3 Cited in November 10, 2009 IEA press release available at http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=294
4 IEA, *World Energy Outlook 2009*, page 196.
5 IEA, *World Energy Outlook 2009*, page 216.
6 W. L. Hare. A Safe Landing for the Climate. *State of the World*. Worldwatch Institute. 2009.
7 Joel B. Smith et al., Assessing Dangerous Climate Change through an Update of the Intergovernmental Panel on Climate Change (IPCC) "Reasons for Concern". *Proceedings of the National Academy of Sciences* published online before print february 26, 2009, DOI: 10.1073/PNAS.0812355106. The article is freely available at: http://www.pnas.org/content/early/2009/02/25/0812355106.
8 IEA, *World Energy Outlook 2009*, p. 81.

Figure 1.
Global Demand for Oil in 4 Scenarios



The **Energy [R]evolution Scenario** only uses proven technologies and is based on five key principles:

1. Equity and fairness

2. Respect natural limits

3. Phase out dirty, unsustainable energy

4. Implement renewable solutions and decentralise energy systems

5. Decouple growth from fossil fuel use

Energy [R]evolution:
Leaving the fossil fuels in the ground to keep global temperatures down

If rising temperatures are to be kept within acceptable limits, greenhouse gas emissions must be signficantly reduced. That means changing how we produce, distribute and consume energy.

Three scenarios up to the year 2050 are outlined in the Energy [R]evolution report: a Reference Scenario, an Energy [R]evolution Scenario with a target to reduce energy related CO2 emissions by 50 per cent, from their 1990 levels, and an advanced Energy [R] evolution Scenario which envisages a fall of more than 80 per cent in CO2 by 2050.

The **Reference Scenario** is based on the reference scenario in the International Energy Agency's 2009 World Energy Outlook (WEO 2009) analysis, extrapolated forward from 2030. This is the scenario which the IEA associates with six degrees of warming, relative to preindustrial temperatures. In Figure 1, we have also included the IEA's Low-Carbon Scenario, which shows a drop in the demand for oil and particularly for unconventional oil.

The **Energy [R]evolution Scenario** has a key target for the reduction of worldwide carbon dioxide emissions down to a level of around 10 Gigatonnes per year by 2050. A second objective is the global phasing out of nuclear energy. To achieve these goals the scenario emphasizes energy efficiency. At the same time, all cost-effective renewable energy sources are used for heat and electricity generation, as well as the production of bio fuels. The general framework parameters for population and GDP growth remain unchanged from the Reference scenario.

The **Advanced Energy [R]evolution Scenario** takes a much more aggressive approach to the climate crisis facing the world. In order to pull the emergency brake on global emissions it therefore assumes much shorter technical lifetimes for coal-fired power plants – 20 years instead of 40 years. This reduces global CO2 emissions even faster and takes the latest evidence of greater climate sensitivity into account. To fill the resulting gap, the annual growth rates of renewable energy sources, especially solar photovoltaics, wind and concentrating solar power plants, have therefore been increased.

With respect to the demand for oil, *Energy [R]evolution* demonstrates how we can eliminate the need for pursuing risky, high-carbon unconventional sources such as the tar sands.

The main demand for oil comes from the transport sector. This is projected to increase substantially over the coming decades, requiring major investments in exploration and development of new supplies from increasingly risky and expensive sources. In the IEA's Reference Scenario, demand for oil rises from 84.7 million barrels per day in 2008 to 105.2 million barrels per day in 2030, with unconventional oil production rising from 1.8 to 7.4 million barrels per day over the same period. In the IEA Low Carbon Scenario, total demand for oil in 2030 is lower than in the Reference Scenario, but still higher than 2008 levels.

To cut back on the need for oil, the Energy [R]evolution scenarios tap into the large potential for improving the efficiency of the transport sector by shifting freight from road to rail, expanding public transit, and by using much lighter, smaller and more efficient passenger vehicles.

The other major factor reducing the demand for oil will be a switch to electric drive trains for vehicles. In the Advanced Energy Revolution Scenario, the final energy share of electric vehicles on the road increases to 4 per cent by 2020, 19 per cent by 2030 and to over 50 per cent by 2050. Public transport systems will also increasingly use electricity to power their vehicles.

This reduces greenhouse gas emissions because the electricity sector will be the pioneer of renewable energy utilisation. By 2030, 60 per cent of electricity will be produced from renewable sources, rising to 95 per cent by 2050. A significant share of the fluctuating power generation from wind and solar photovoltaic will be used to supply electricity to vehicle batteries and produce hydrogen as a secondary fuel in transport and industry.

When combined, these factors eliminate any global need for any dirty tar sands oil by 2030.

www.greenpeace.ca

Greenpeace Canada

33 Cecil Street, **Toronto**, Ontario, M5T 1N1
454 Laurier East, third floor, **Montreal**, Quebec, H2J 1E7
1726 Commercial Drive, **Vancouver**, British Columbia, V5N 4A3
6238 - 104 Street NW, **Edmonton**, Alberta, T6H 2K9

1 800 320-7183

GREENPEACE