



World Oil Exports; US Oil Imports; and a Few Thoughts on Canada

Posted by [Gail the Actuary](#) on August 13, 2009 - 10:15am

Topic: [Demand/Consumption](#)

Tags: [canada](#), [oil exports](#), [oil imports](#), [oil sands](#), [tar sands](#) [[list all tags](#)]

Matt Mushalik from Australia was good enough to send me this graph of world oil exports, calculated from [new oil data](#) provided by the EIA.

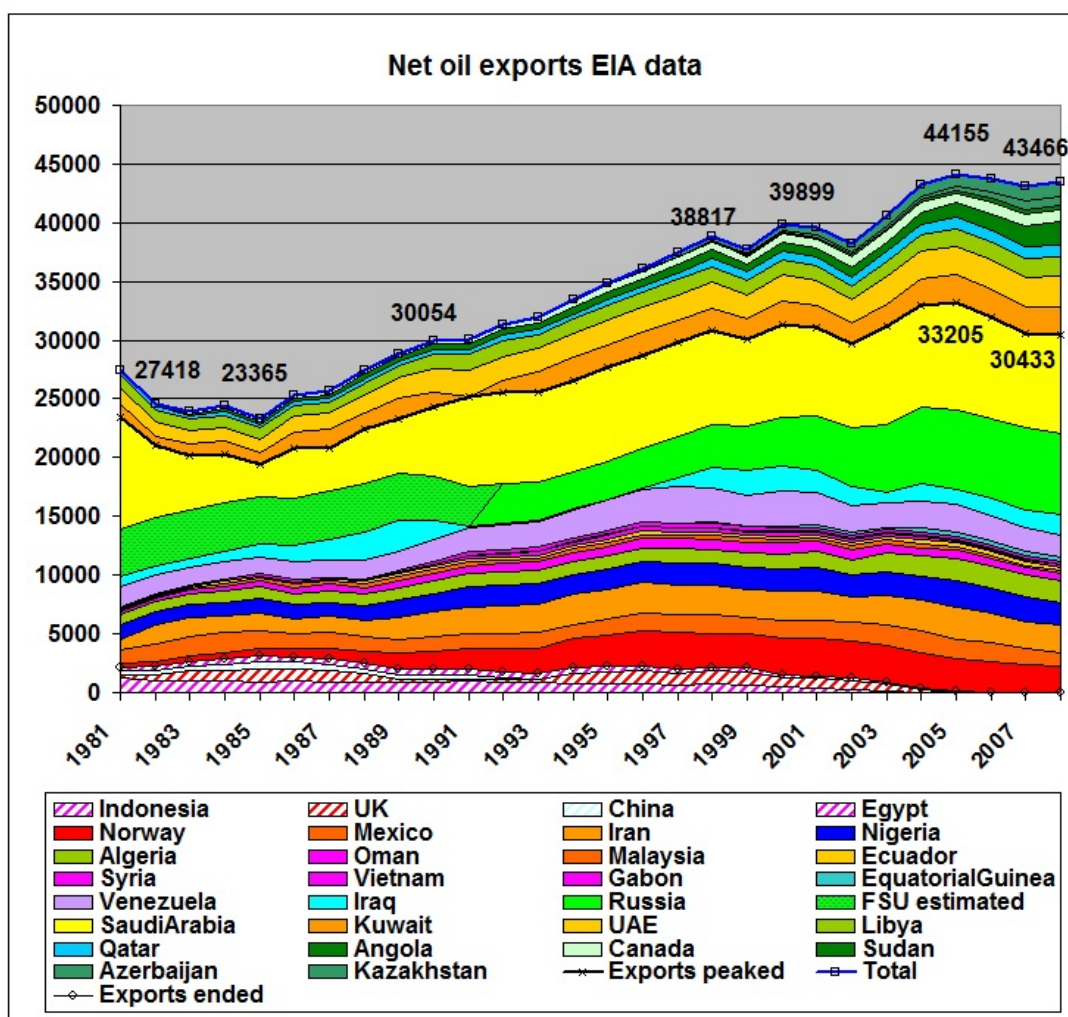


Figure 1. World net exports, based on EIA data

This inspired me to put together a few other somewhat related graphs, relating to oil exports and US imports. Since Canada is such a tiny piece of world exports, but seems to be mentioned as a possible major source of future US imports, I have looked at it separately as well.

The likelihood of a huge ramp up in imports from Canada seems remote. Canadian exports to the

US require continued imports to the East Coast of Canada. If imports of oil to Canada decline as world exports decline, US oil imports from Canada may also decline, because ramped up production from oil sands may not be enough to offset declines in production and imports elsewhere.

The major thing we note from Figure 1 is that the peak in oil exports seems to be in 2005, with recent exports down less than two percent. If oil production in 2009 is down, it is likely there will be a bigger drop off exports than in prior years. The two major exporting countries are Saudi Arabia and Russia. The graph seems to indicate that at least thorough 2008, exports are relatively level for the two large exporters.

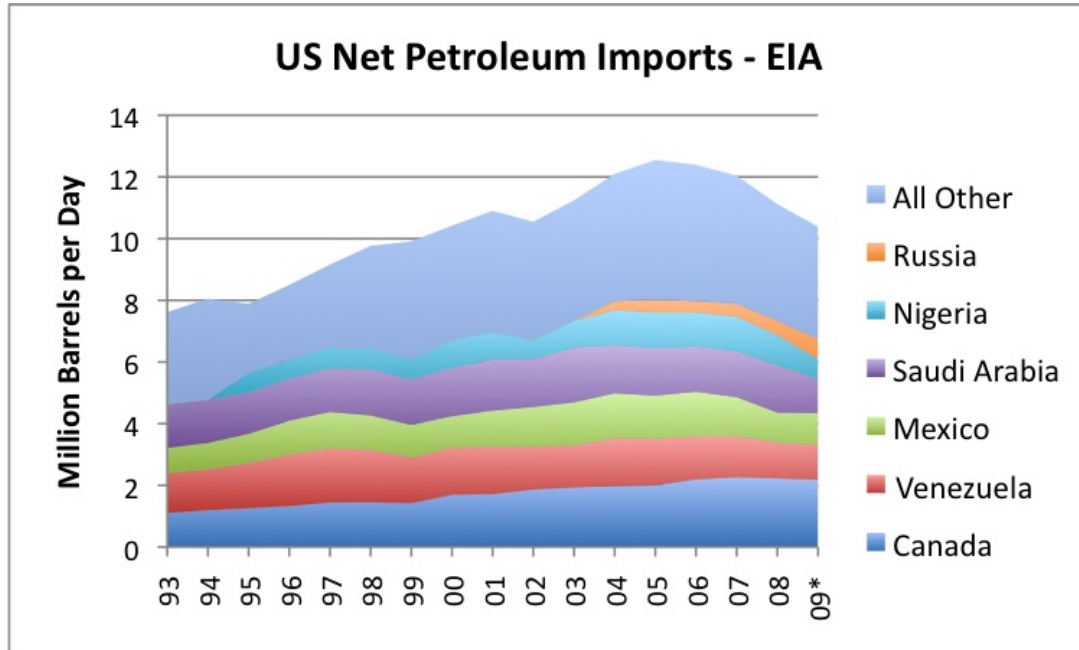


Figure 2. US Net Oil Imports, based on [EIA data](#). *2009 is partial year average.

In the US graph, the peak in imports is also in 2005, with a much steeper downward slope than in the world export graph. This would suggest that the US is being outbid elsewhere on imports.

On Figure 2, I have shown US imports separately for the largest US sources. The most consistent of the exporters over the period (up until 2009) was Saudi Arabia. Mexico's exports have been declining, as have those of Venezuela. The only country whose exports to the US have been increasing is Canada.

But if a person looks back at Figure 1, Canada is only a thin light green line near the top of the graph, with relatively little net exports. How can it be ramping up exports to the United States?

I decided to look at this a bit further.

If one looks at Canadian data, using a combination of EIA and [CAPP data](#), one discovers that Canada's sources of oil look like this:

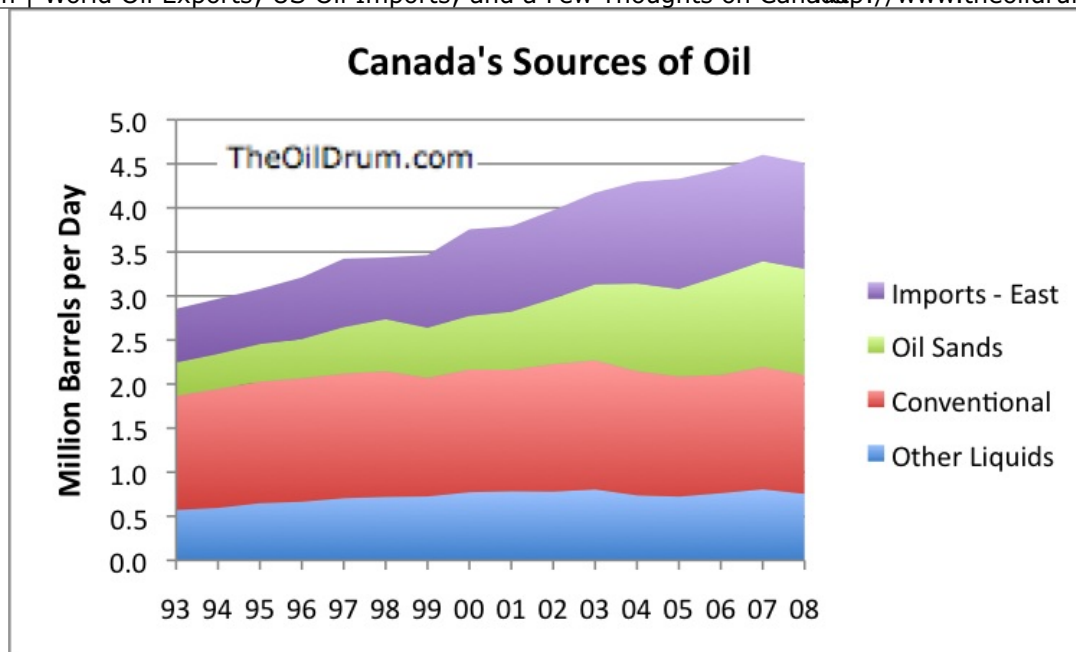


Figure 3. Canada's sources of oil, including its own production (split between Oil Sands, Conventional, and other liquids) and oil imported on the East Coast of Canada.

The way that Canada can be a major exporter to the US, even though it doesn't produce a whole lot more than it consumes, is by importing oil on Canada's east coast. I haven't seen any exhibits showing where this is from, but various comments usually seem to suggest that this is mostly oil from the Middle-East. Because of geography, it works out that Canada ends up consuming most (or all) of the imported oil itself. The oil it exports to the US it exports in pipelines from Canada's west, that come down the middle of the US, as shown in Figure 4.

Canadian & U.S. Crude Oil Pipelines All Proposals



Figure 4. Oil pipelines from Canada to the US, including proposed pipelines, from [CAPP June](#)

The way the current pipelines are configured, the US is almost a captive market for oil exports from Canada (although it is possible to get oil back up to Montreal, for example). Proposed pipelines would take oil to the West Coast of Canada, for export to China and the Far East.

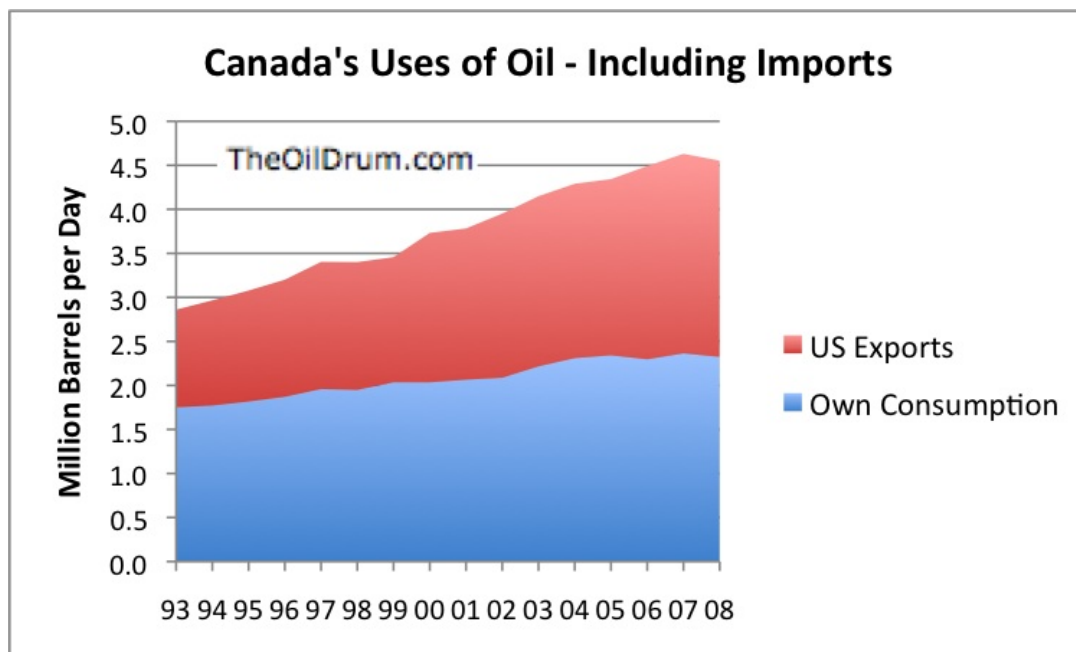


Figure 5. Canada's total oil (including imports from the East) divided between Canadian consumption and Exports to US, based on EIA data.

The above graph takes the total oil available to Canada, including imports from the East Coast and divides it between Canadian consumption and net US exports. It is clear that US exports have been growing more rapidly than Canadian consumption.

We can also break Figure 5 out to show how Canada's imports affect what is available. Figure 6 splits exports to the US (from Figure 5) into two pieces--those that are indirectly supported by Imports on the East Coast of Canada, and those corresponding to Canada's net exports.

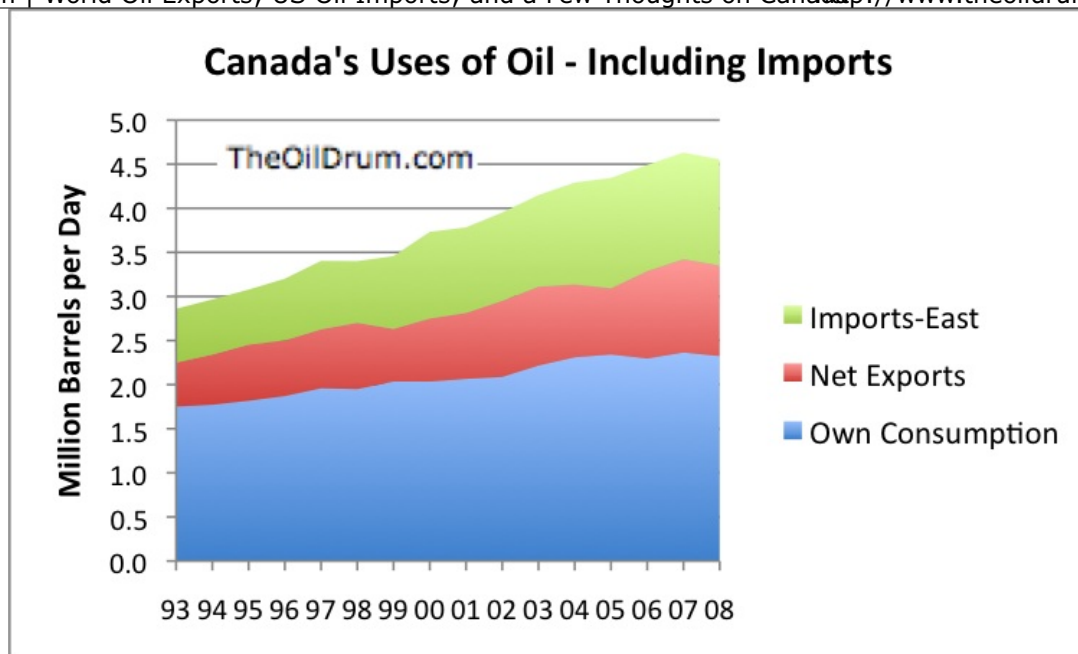


Figure 6. Canada's total oil (including imports from the East) divided between Canadian consumption and Net Exports, and Imports from the East Coast, based on EIA and CAPP data.

From Figure 6 we can see that more than half of US imports are available because of Canada's East Coast imports. Both Canada's East Coast imports and its net exports have been increasing in recent years.

So what is likely to happen in the future to Canada's oil production and exports? The Canadian Association of Oil Producers (CAPP) [puts out](#) some quite high estimates of future oil sands production. Other types of Canadian petroleum production are expected to decline, partially offsetting the increase.

Figure 2.1 Canadian Oil Sands & Conventional Production

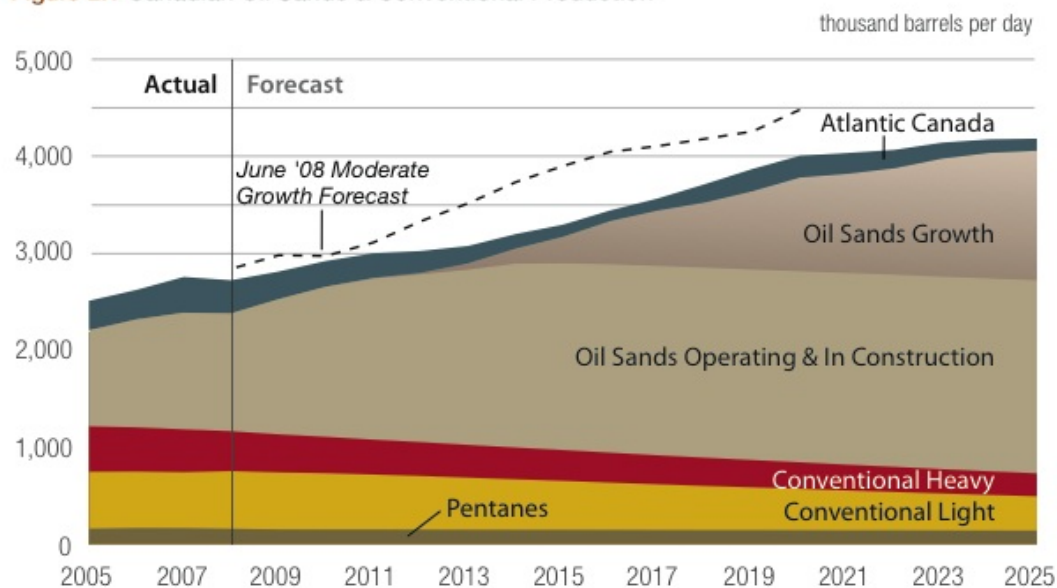


Figure 7. CAPP forecasts of Canadian oil production from [CAPP June 2009 Crude Oil: Forecast, Markets, and Pipeline Expansions](#)

Cambridge Energy Research Associates (CERA) recently made forecasts of Oil Sands production. (Their report is available free with registration at this [link!](#))

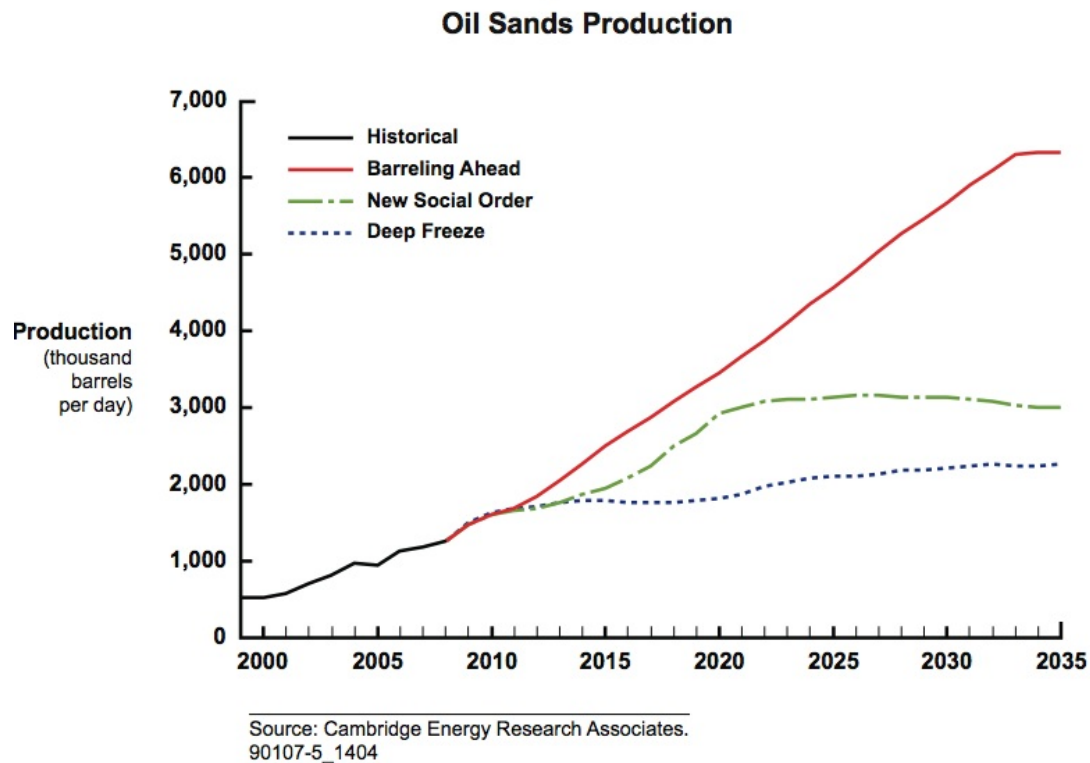


Figure 8. CERA forecasts of Oil Sands production, from report cited above.

CERA's two lower forecasts are below the one made by CAPP. The "Barreling Ahead" forecast seems to be somewhat above the CAPP forecast.

My own view is that is technology and price will be the biggest determinants of the extent to which oil sands production is expanded. Necessary price to expand production will depend on whether a carbon tax is imposed, and also on whether royalties remain at the current level or increase. Both of these suggest that necessary price is likely to be quite high-likely \$80 to \$100 barrel or more, in the absence of technology improvements. If the necessary price for expansion is quite high, I would expect that one of the two lower CERA projections would be most likely. If there are big improvements in technology, production costs might be lower, and output might be higher.

Assuming production is in the range of CERA's two lower projections, I put together a very rough forecast of what Canada's sources of oil in the future might look like.

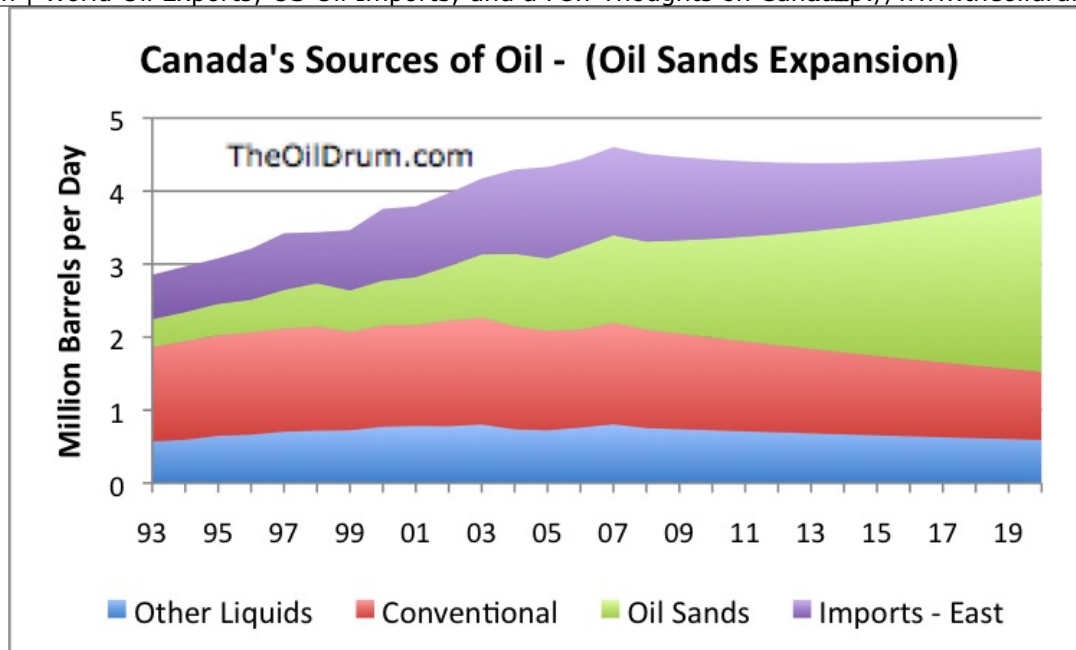


Figure 9. My rough estimate of Canada's future sources of oil.

In this forecast, I show East Coast imports decreasing by 5% a year; conventional production decreasing by 3% a year; and other liquids decreasing by 2% a year. Oil sands production is assumed to increase by 6% a year, so that by 2020, it is 2.4 million barrels a day. In this scenario, the total oil available to Canada stays more or less flat, dipping somewhat between now and 2020.

If Canadian consumption continues to rise, the amount available for US exports will decline. In Figure 10, I show what US exports might look like, if Canadian consumption increases by 1.5% per year, and the US gets the balance as exports.

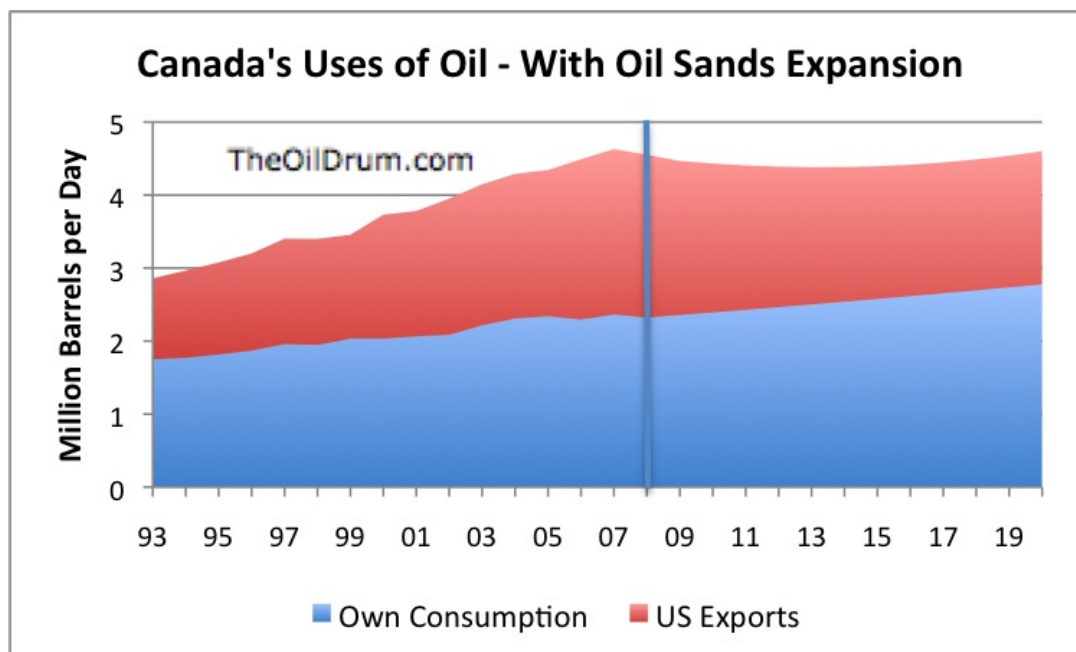


Figure 10. A rough guess at what might be available for exports.

Figure 10 shows that even with Oil Sands expansion, there is a significant chance that imports of oil from Canada will decline between now and 2020.

One thing I should point out is that as I read Canadian commentary about Canadian oil, there seems to be growing unhappiness about NAFTA and the United States having almost a monopoly on oil produced in Western Canada. Some of the comments I have read include the following. (See for example [Tar Sands by Andrew Nikiforuk](#)).

- Why should Canada run the risk of a sudden decline in imports, and the US get secure oil?
- The price the US pays is artificially low, because of the pipeline structure. China would probably pay more.
- Oil sands producers should pay more in royalties than they are (even with the recent increase).
- The US takes the oil Canada exports, and sells gasoline for \$2.50 a gallon. Canadians now pay \$1.00 a liter at the same time US citizens pay \$2.50 a gallon. It isn't fair that Canadians are taxed to keep consumption down, but the US isn't.
- When Canadians export oil to the US, the Americans get all of the refining jobs. If Canada kept the oil in Canada, it could keep the refining jobs for itself.
- Why should Canada get hit with a charge in our carbon emission calculations for oil it sends to the US? If Canada is going to be charged for the emissions, it should at least be using it itself.

I expect these beliefs will become more widespread, as Canadians begin to understand the peak oil situation. Even now, there is a fair amount of writing indicating that if Canadians had their way, they would keep the oil they are producing for themselves, or sell it elsewhere.

If the US decides because of greenhouse gasses that it doesn't want Canadian oil, it seems to me that that decision would have little bearing on whether Canada produces oil from the oil sands. Many Canadians would be more than happy to get rid of us as competitors for their oil. The result would be that we would get less oil piped to us in the mid-section of our country. Canada might import less oil from abroad, and we theoretically would be able to buy that oil directly ourselves.

One issue might be logistics, though. Pipelines from Canada serve the Midwest. A shortfall in oil would likely hit the ends of the pipelines (and trucked supply lines) in the Midwest. I would expect that the ones hit disproportionately would be Midwestern farmers. It is not clear that it would be easy to get alternative petroleum supply to the farmers. It seems like oil piped up from the Gulf Coast would likely be inadequate as a substitute for a shortfall. This would especially be the case if an overall shortfall occurred because of a hurricane.

It seems to me that we are likely looking at a reduction of imports from Canada in the next ten years, even under the best of circumstance (unless a huge improvement in technology allows a big ramp up of production from the oil sands, and we decide we can live with the CO2 emissions). If a reduction in Canadian imports is likely, we should probably be thinking now about rationing schemes that would protect the farmers from loss of diesel fuel, if there is an overall shortfall in supply.

The [Wicks report](#) on Energy Security recently published in Britain gives a very different impression about oil sands exports. The Wicks report paragraph 2.27 says

It is expected that over half of all the oil consumed in the world in 2030 will be traded

across national borders. . . In contrast North America becomes much less dependent on imports, dropping by almost a half, as production from Canadian oil sands increases.

If the authors would sit down and look at all of the pieces, I doubt that they would come to any such conclusion, in the absence of a dramatic change in technology. CERA's two lower forecasts are showing 2030 oil sands production to be similar to 2020 production. If oil sands production is similar, and other pieces in Figure 9 are lower, Canada's total oil available will drop by further by 2030. If its consumption continues to rise, as in Figure 10, the amount available for export in 2030 will be lower yet than I am forecasting for 2020 (which in turn is lower than now).

In 2008, oil sands production was 1,213,000 barrels a day, according to CAPP. I am forecasting it to approximately double by 2020. Production would have to ramp up a whole lot more than this to make a meaningful difference to North American oil use.



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