

✍ American Energy Security, Canada's Oil Sands and Climate Change

✍ As a new administration looks to strengthen U.S. energy security while also addressing climate change, few developments will appear to highlight the tension between those objectives more starkly than the ramp-up of Canadian oil sands production. In reality, increasing oil sands output should not be unmanageable from a CO₂ perspective relative to other petroleum sources.

✍ From a U.S. energy security perspective, Canada's oil sands are a resource without equal. With current commercial proven reserves of 174 billion barrels, this resource trails only Saudi Arabia and arrives in the U.S. by secure pipelines from an ally that is already America's number one oil supplier. With a known and fully explored in place resource of 1.7 trillion barrels, current proven commercial reserves may be only the start as additional regions are included in the data base and as technological breakthroughs and longer-term high oil prices converge to expand the recoverable resource. What the ultimate commercial resource may be remains unknowable, but a Saudi-scale number well over 300 billion barrels is not unlikely.

✍ Current oil sands production is 1.3 million barrels per day (bpd) against global output of roughly 85 million bpd. By 2012 oil sands output was expected to reach two million bpd, by 2017 three million bpd and by 2020 some 3.5-4.0 million bpd, moving Canada from number seven to number four oil producer. However, current oil prices and material costs, as well as the global financial crisis, are blunting this rapid rate of expansion as some significant future projects have been put on hold. Still, the trend-line based on projects already under construction is sharply up. The pipeline industry is undertaking major expansions to accommodate this growing supply.

✍ Any visitor to Alberta's open-mine oil sands projects around Fort McMurray realizes that these projects involve environmental costs. Reports, however, that developing the oil sands requires strip mining an area the size of Florida are simply wrong. Much of the Florida-sized oil sands region will never be commercially viable and over 80 percent of the developable resource will be recovered via in-situ technology (using drilling) as most oil sands are too deep for mining. The mined region will be roughly the size of Tampa, Florida, not the State of Florida. Most of the production now comes from mining; in another decade, most will come from in-situ.

✍ And while the water, air and even CO₂ impact of mining projects is steadily declining per barrel of production, it is on the in-situ front that radical technological breakthroughs are coming. Today the heat to melt the oil sands to release the bitumen (heavy oil) comes primarily from steam generated from natural gas in a process called SAG-D (steam assisted gravity drainage). Production scale test projects are now using the petroleum coke from previous production instead of natural gas, using solvents at much lower heat (reducing energy use) and even combusting part of the oil sands themselves underground as a heat source. This last, very promising, technology affects a partial upgrading, reducing energy inputs and geologically sequestering much of the CO₂. In time, continuous technology improvement could make oil sands production carbon neutral or better even against light crude.

✍️ Already many in-situ projects have full-cycle carbon footprints that are little or no higher than for heavy oil the U.S. buys from Mexico, Nigeria and Venezuela or even California's thermal oil production. This underlines the need to look beyond production carbon footprint figures, which are far higher for oil sands relative to some now scarce light crudes, but which ignore the reality that the consumer of the oil accounts for over 75 percent of the CO₂ released and that transport from overseas also has a high carbon cost.

✍️ Observers should also factor in who the U.S. is buying from and examine such questions as relative environmental, regulatory and political systems. In particular, is it desirable to buy oil from countries that are unfriendly to the U.S., that are poorly positioned for a variety of reasons (conflict, political instability, insecure transit points) to be reliable suppliers and that have poor regulatory systems and weak or ineffective environmental standards? The alternative of buying additional oil from Canada means the U.S. sends more money and sources more oil from a country that shares its values, is well positioned to be reliable, has world class regulatory systems and that adopts and implements high environmental standards. And Canada recycles most of its energy income into imports from the U.S.

✍️ While much of the world today is considering attaching a cost to carbon, the province of Alberta is already collecting millions of dollars monthly from major emitters when they fail to achieve their carbon intensity targets. And although intensity targets cannot be the long-term measure, that they are collecting funds now underlines that Alberta perhaps is more accurately described as a leader than a laggard. Alberta has also committed two billion dollars in available budget funds to support local carbon sequestration and storage (CCS) projects. These funds should enhance recovery from existing oil fields and will also be used to advance CCS from oil sands projects and for Alberta's extensive coal-fired electricity production. Albertans appear to understand not only that they need to tell their existing story better, but that they must continue to raise the environmental bar. Neighboring Saskatchewan is also CCS leader. Canada's provincial and federal governments have repeatedly indicated they want to implement overall CO₂ policies "compatible" with what emerges in the U.S.

✍️ In the coming months the U.S. appears set to enter into a fresh policy process in which it wrestles with the tension between the need to address climate change via lower carbon footprints at the same time as it labors to enhance energy security. And while wind, solar, hydro, nuclear and natural gas will play an increasing and relatively benign role in U.S. energy security, the transportation sector likely will continue to be dominated by oil-based hydrocarbons for years if not decades. Given that reality, it is important to realistically compare the actual full cycle carbon footprints of our sources of oil, encourage technological innovation in the oil sands and be mindful of the relative security, reliability and environmental standards of our oil suppliers. If all those factors are borne in mind, it is likely the U.S. will decide to implement climate change and energy security policy in a manner that leaves policy space for increasingly sustainable and always reliable Canadian oil sands production.