

Smoke, mirrors and carbon

BY DAVID W. KEITH AND JOULE BERGERSON, FOR THE CALGARY HERALD NOVEMBER 29, 2008

The recent flurry of news stories about carbon capture and storage (CCS) have been tied to a storyline in which a "secret" government briefing note shows that CCS won't work in the oilsands, contradicting the government's claim that CCS will green the oilpatch.

This story is truly a tempest in a very small teacup that has served mainly to obscure the hard choices we face. The briefing note and the public report on which it was based are, in fact, consistent in their message that it may be harder (but not impossible) to use CCS to cut tarsands carbon dioxide than it would be at coal-fired electric power plants.

The bigger story is that Canadian debate about climate change is being boiled down to a single misleading equation: climate-changing-emissions equals tarsands. Let's get some facts on the table. The oilsands now produce about four per cent of Canada's emissions; if production were to triple with no change in technology and all other emissions stopped growing, they could be as high as 10 to 15 per cent around 2025.

This is a big number, and it's going in the wrong direction since if we want to avoid dangerous climate change, we should be driving our emissions to zero sometime soon after 2050. However, even if we shut down all oilsands operations tomorrow, Canada would still be one of the top greenhouse gas emitters' per capita in the world. Fixing the oilsands will not get us off the hook.

There's no doubt we must clean up many aspects of oilsands production and we must get serious about cutting carbon emissions to secure our climate, but that does not mean we should put all our emissions-cutting chips on the tarsands. Unlike conventional pollutants which are local, nature does not care where carbon is emitted, so when we look to cut carbon we should first look to where it's cheapest to make the cuts.

Can we capture oilsands carbon? Yes, but capture is easiest on the largest facilities and the ones that vent the most concentrated exhaust. Size matters: a typical in-situ oilsands operation emits one-tenth of the carbon emitted by a typical coal-fired power plant.

It is also almost always cheaper to do capture if it is designed in from the beginning than added on later. If we want to use CCS to go after carbon emissions the most cost-effective way to do it, the way that gets us the most environmental protection for our dollars, is to focus on coal plants and large upgrader complexes not on the more dispersed emissions at Fort McMurray.

Many news reports have incorrectly stated that the \$2-billion CCS subsidy was designed only for the oilpatch, and some environmental groups have argued that CCS is only acceptable for oilsands. But this focus contradicts the sensible wisdom that we should think globally and act locally.

The rapid buildup of coal-fired power in China is perhaps the biggest single threat to the climate. We have the opportunity to develop cost-effective CCS technologies here that could bring enormous

benefits globally. The specific CCS technologies that will be developed for the tarsands will provide fewer emissions cut per dollar, and less chance to develop the technologies that could solve the much larger problems beyond our borders. In spite of this, we are building a new coal-fired power plant in Alberta today. The fact that this project is moving forward without CCS and without much notice is a clear sign that focusing the climate debate on oilsands is obscuring better opportunities to cut emissions.

This focus also obscures the fact that for each tonne of carbon extracted from the oilsands less than 30 per cent is emitted during fuel production while 60 to 80 per cent of the life cycle emissions come from burning fuel in vehicles. Since most of the carbon leaves Fort McMurray as fuel, there is no way to make the oilsands carbon neutral because even if we used CCS to eliminate all emissions from oilsands operations we would only be tackling about a quarter of their life cycle emissions. To solve the full problem we must re-engineer the transportation sector that drives the tarsands development. And, in the long run, we cannot keep extracting carbon from the ground and pumping it into the atmosphere if we want a stable climate.

Clearly CCS should be part of oilsands operations. But first things first. The smart place to start is where we will get the most bang for our environmental buck. This means choosing the most cost-effective options from a menu that includes energy efficiency, renewables, CCS and nuclear power. Because CCS technologies are well matched to the skills of the Alberta energy industry, we should use it for coal-fired power and the oilsands. However, in the long run, we need to find ways to harness the wealth and human capital associated with oilsands development to fuel the innovations and investment we need to succeed in a carbon neutral world.

David Keith is the Canada research chair in energy and the environment and director of the University of Calgary's institute for sustainable energy, environment and economy's energy and environmental systems group.

He is also a professor in the departments of chemical and petroleum engineering (schulich school of engineering) and economics. Joule bergerson is an assistant professor in the department of chemical and petroleum engineering, schulich school of engineering and a member of the university of Calgary's institute for sustainable energy, environment and economy's energy and environmental systems group.

© Copyright (c) The Calgary Herald