## Should we embrace carbon capture and storage?

## By Dr. John R. Parkins

arbon capture and storage (CCS\*) technology extends our carbon intensive infrastructure, it perpetuates dependence on carbon-based energy sources and it plays no role in meaningful transition to renewable energy sources. This strong position against CCS is consistent with my views on all forms of proposed carbon-based energy infrastructure including pipelines for transporting bitumen. Yet a thoughtful view on CCS technology requires considering alternative views, and this is what I got in October as a panelist at a public lecture on CCS technology. The lecture was sponsored by the European Union Centre of Excellence at the University of Alberta and focused on lessons from successful implementation of CCS in North America and Europe. For readers who are unfamiliar with this technology, CCS is a process of capturing CO<sup>2</sup> from burning fossil fuels and storing this waste material permanently in geological formations.

Some panelists argued that a changing climate is such an urgent threat we really have no choice but to implement every available technology that can help reduce CO<sup>2</sup> emissions into the atmosphere. Particularly in regions of the world (like Alberta) with large coal reserves, it's unrealistic to assume that transition to cleaner technologies will happen quickly. So we need intermediate technologies like CCS to reduce greenhouse gas emissions in combination with many other technologies such as wind, solar and geothermal.

Germany's *Energiewende* (transition to renewables and energy efficiency) offers

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a case in point. While it builds an impressive renewable energy system with extensive wind and solar electricity installations, it continues to build coal-fired power plants to meet the country's energy demands. In this context, it seems entirely reasonable to expect new coal-fired power plants to have CCS capabilities. If we are going to meet international climate mitigation targets we need CCS to get there. CCS has technical challenges and risks. For example, it often requires large investments of public funds. But these challenges are not insurmountable and the growing risks from unmitigated climate change outweigh the risks from implementing CCS technology.

Other panelists were less enthusiastic about CCS as a technological fix. When we talk about how to meet our climate mitigation challenges we shouldn't limit this conversation to the pros and cons of one particular technology. If we do that we miss the opportunity to have broader conversations about a full range of energy alternatives, some of which may be technical (like CCS) but others may be regulatory (such as a carbon tax or energy efficiency requirements). In Alberta we also have cleaner natural gas as base load for electricity that can complement the variability of renewable resources such as wind and solar. But, as Joe Vipond points out elsewhere in this issue, we must minimize fugitive emissions from natural gas operations. These alternatives to coal-fired power plants and CCS may be an important part of the conversation and need to be considered in a broader debate about



how to build a more sustainable energy system.

Another aspect of the CCS debate involves the economics of this technology. In order to make CCS viable in North America it requires large investments of public funds and an industrial partner that can utilize the captured carbon as a revenue stream. In the Saskatchewan Boundary Dam installation, the CO<sup>2</sup> is captured and sold to local energy companies for enhanced oil recovery. In other words, CCS is used to make otherwise marginal oilfields economically viable. For climate-concerned citizens, this marriage between CCS and fossil fuel production is perhaps not the most compelling reason to jump on the CCS bandwagon.

A further point I brought into the panel discussion involves questions of scale and the flow of benefits from energy technologies. Options for powering our electricity grid are proliferating. With renewables becoming more competitive and smart grid technology giving us many new ways to turn on our lights, large and centralized power plants are not the only way forward. Moreover, research shows that when citizens have a stake in the design, ownership, and benefit stream from local energy systems (such as wind turbines owned by municipalities or local cooperatives), local public support is strong. In contrast, CCS is tied to large and centralized power installations, limited to ownership by large corporations and distant stakeholders, and more likely to be opposed by publics wherever such installations are proposed.

So, after listening to scientists, lawyers,

industry officials and public policy experts discussing the merits of CCS, what are my views now? I'm left with two perspectives. Given the world's insatiable appetite for energy, we are not likely to eliminate our dependence on coal-fired power plants any time soon. So yes, I expect a strong climate change mitigation policy would require CCS in cases where the technology can be implemented with minimal risk. The Saskatchewan government is doing just that as it tries to show leadership on strategies for greenhouse gas emissions reduction.

As a pragmatist, I see some merit in CCS. As a critic, I think CCS is stuck in an older way of thinking about how we power the grid with large and centralized systems that are increasingly irrelevant. Within decades we will have even more opportunities to move beyond these Jurassic coal plants to turn on our lights and power our economies with more sustainable energy systems.

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Wild Things, 60 x 72, encaustic/oil, PHOTO: © LISA KOZOKOWSKY

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