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Carbon Capture and Storage—Should we? Can we?

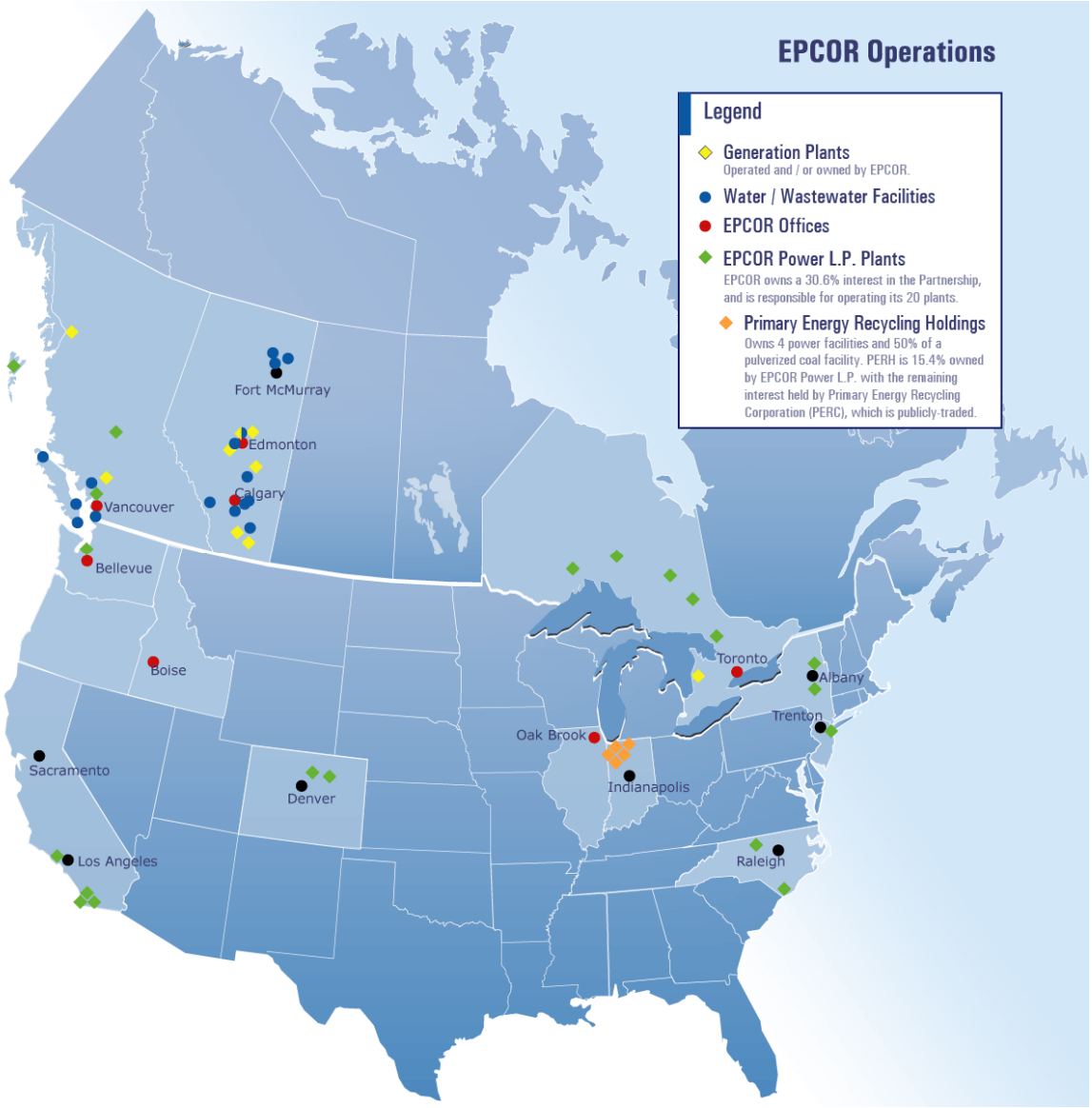
Can the United States and Canada move the marker by working together?

Dr. David Lewin

EPCOR Senior Vice President, IGCC Development

Chair, Canadian Clean Power Coalition

- Investments in Canada and the United States
- Responsible for operating power generation with gross capacity of > 3,400 MW
- Owns 30.6 per cent of EPCOR Power L.P., Canada's largest power partnership
- EPCOR-operated facilities generate power from renewable sources – wind, small hydro, biomass, landfill gas; and through waste heat recovery and recycled energy



Carbon Capture and Storage: Should We?

Public policy directions are making the paradigm shift to IGCC and CO_2 capture technologies imperative.

- The Canadian Government's Regulatory Framework for Air Emissions, released in Apr 2007, mandates greenhouse gas reductions. An intensity-based emission target of 18% by 2010 from a baseline of 2006, followed by a 2% decline per year.
- Air emissions of NOx, SOx, PM and now HG have been tightened during the past few years through provincial regulation. Alberta's CO_2 reduction targets begin with a 2% per year reduction in 2010 to a total of 12% by 2015.
- Within the U.S., carbon policies have advanced by State, and – in the northeast – by region. Generally viewed that development of a national U.S. program is a foregone conclusion.
- EU policies adopted in Jan 2007 moved away from broad incentives, calling for construction of 12 large scale sustainable fossil fuel plants by 2015, and development of a timeline for existing gas and coal-fired plants to install carbon capture and storage technology. Target date for all new plants to achieve low emission is 2020.

Carbon Capture and Storage: Can We?

Costs for an IGCC plant cannot be determined without resolving critical CO_2 transportation and sequestration issues.

- Carbon capture and storage (CCS) represents a range of technologies that reduce emissions and / or enable CO_2 to be captured and effectively stored rather than released into the atmosphere.
- It is made-up of three distinct steps – capture, transportation, storage.
- Central limitation is that there is no full-scale power plant in operation anywhere in the world that captures and stores CO_2.
- Development of CCS technology is dependent upon availability of sites for sequestration and supporting infrastructure, in addition to well defined legal and regulatory frameworks. This is in its very early stages.

Carbon Capture and Storage: Can We?

New area of business – have to develop and acquire expertise

- Our history and experience is along the lines of power and water
- This is a new line of business for the company
- It presents many very complex challenges
- We will need to obtain workers with the skills we require
- We will have to train workers to operate the facility

Carbon Capture and Storage: Making Progress

Removing technical and cost barriers.

- Priority must be placed on demonstrating CO_2 capture for pre- and post-combustion.
- Steps necessary to implement a large-scale carbon capture and storage system in Canada identified by ICO_2N (Integrated CO_2 Network) group of companies, Dec 2007.
- Alberta Saline Aquifer Project (ASAP) involves 19 companies focused on identifying saline aquifers for long-term CO_2 storage in Canada, and designing sequestration sites to receive injected CO_2.
- Successful commercialization will require meaningful dialogue with investors, customers, taxpayers about the cost of “greening” the electricity supply. Costs and risks should be allocated between the three – no one source can bear all. If society desires zero-emission power, then society will need to pay for it.

Carbon Capture and Storage: The future

Conclusion - If not this then what?

- Coal is a vital part of providing for the Country's future energy security.
- EPCOR is taking up the challenge.
- Other partners and agencies have to step up to ensure that CCS can be developed.