

Fuelling green government

by Melanie Collison

The Government of Alberta is hammering home the point that it believes strongly in reducing greenhouse gas emissions – not just because of the *Kyoto Accord*. This spring it inked agreements with two energy producers that will reduce government dependence on fossil fuels to less than 10 percent of its total electricity consumption. Along the way, it is carving \$4 million off its annual \$30 million energy bills because its green power sources offer long-term contracts that aren't available from traditional producers.

The move is an expansion of a five-year-old program to retrofit government buildings, including the installation in March of a 23-module solar power system at the legislative buildings in Edmonton. By 2005, emissions will be about 26 percent below 1990 levels from government operations because the government garnered stunning results when it went searching for green energy sources last winter.

Alberta Infrastructure spokesperson David Bray says the initial goal was modest. "We went out to get about 25 percent if we could find it, and discovered we could get a little more than 90 percent," he told *Summit*. "We couldn't get 100 percent because we have a couple of buildings, the Jubilee Auditoriums for example (concert auditoriums in Edmonton and Calgary), that are powered through the universities. We also have tourist offices in British Columbia, Saskatchewan and Montana, which are on their power systems. Everything else will be green powered as of 2005."

The government is playing to regional strengths in its purchases. Half the power will come from biomass technology (a 20-year contract) up north. Biomass involves burning bark, sawdust, shavings and other wood residues or waste to generate both heat and power. Canadian Gas and Electric Co. Ltd., a subsidiary of Canadian Hydro Developers

Inc., has partnered with Canadian Forest Products Ltd. on a \$40-million 25-megawatt biomass heat-and-power plant near Grande Prairie. The wood chips and sawdust to be burned are a byproduct of the Canfor Mill. State-of-the-art technology prevents the emission of smoke and gases; it's all turned into electricity. Looking beyond government uses, the Alberta Forest Products Association believes Alberta's forest industry represents a huge opportunity under the *Kyoto Accord* because there is enough wood residue in Alberta for three or four similar-sized projects.

For the other half of the power, the whine of the north's sawmills gives way to the whine of the relentless wind (a 10-year contract) in the rippling grasslands of the south, where only a few bent trees survive. Canada's largest wind farm is currently under construction eight kilometres south of Fort Macleod. Late last year, Canada's largest non-regulated power generator, TransAlta Corp., paid \$37 million to purchase Vision Quest Windelectric Inc., a Calgary-based wind power firm. The purchase was a step towards TransAlta's anticipated \$1-billion investment in wind energy over the next 10 years. Vision Quest is building the \$100-million, 75-megawatt facility in partnership with distributor ENMAX Corp. It is to be completed by late this year.

There's a good reason this wild, hilly swath of southwestern Alberta produces around 40 percent of Canada's wind power from its nine working farms. During its wind season, October to late February, people habitually park their vehicles pointing into the wind because to park backwards is to risk having the wind rip your door off its hinges when you open it. When winter's blasts scream out of the Rocky Mountains at 170 kilometres per hour funneled through Crowsnest Pass, you can't stand up against the force.

Ten years ago, a California power company that wanted experience in cold conditions built the 52-windmill Cowley Ridge farm near Pincher Creek. In those days, Alberta's wind proponents were characterized in the legislature as raving lunatics. It was years before a hint came that the political winds would change, but as the industry has developed nationally, Alberta has acknowledged its value. Also, as the province has deregulated the power industry, it has been to the wind producers' advantage that they can expand their capacity by smaller increments than other sources.



The hammermill: Area where straw is mulched into a powder, increasing the surface area, which allows the cellulose to be easily attacked by enzymes.

As provincial governments promote renewable sources, a brief cross-country sampling suggests that, among the available choices, wind power is strong.

The Government of PEI doesn't have a percentage breakdown of consumption by fuel type, but spokesperson Mike Proud says heating for the main government complex is supplied through a district system fired by municipal waste, wood biomass and oil. Other facilities burn primarily oil, with the exception of a couple of hospitals that burn wood chips. PEI currently purchases three



Photos courtesy Iogen Corporation

The evaporator: Concentrates the fermentable sugars and the "still bottom" (residue) from the fermentor after the sugars are fermented into "beer."

GWh of green electricity from its Crown corporation, North Cape Wind Farm, which is planning to double in size. A prototype wind turbine with an output of 2.6 MW will be operational this summer and will be tested over a two-year period. The government is also exploring hydrogen fuel, and is hosting a hydrogen conference this spring.

Nova Scotia's most promising green energy source is wind, says Eric Twohig, president of the Renewable Energy Industry Association of Nova Scotia. It has potential tidal and wave opportunities as well as solar, but wave technologies are still in the R&D stage, and tidal technology is tricky because of concerns about endangered species of whales, as well as questions of scale.

"We're hoping in Nova Scotia to avoid some of the pain of restructuring," Twohig says, acknowledging the transition problems Alberta has experienced. Nova Scotia has just released a clutch of recommendations for a revamped energy strategy, framed as a series of broad-based objectives that will lead to a strong and viable renewable energy sector. One of the 15-odd actions is that the government "shall participate in a green energy program at premium pricing for a percentage of the electricity used in public buildings," but it doesn't make a commitment to any given percentage. At the moment, Nova Scotia is predominantly coal-fired, and is dependent on imports from South America and the US. Strip-mined imported coal is cheaper than the

Iogen Corporation (www.iogen.ca) owns an EcoEthanol™ demonstration plant in Ottawa and hopes to start building a commercial bioethanol plant in 2004. Iogen's innovative process uses its proprietary enzymes to process cellulose (plant fibre) into fermentable sugars, and ultimately, into ethanol – which, when mixed with gasoline, provides a fuel that reduces greenhouse gas emissions by greater than 90 percent. The ethanol is derived from the cellulose in the non-food portion of renewable feedstocks – corn stover and cereal straw. The photos here depict various parts of the manufacturing process.

province's own under-sea supply, which is also dangerous to get at because it is accompanied by so much methane.

"The move towards green energy – wind power – in Nova Scotia has been driven by constant vocal pronouncements from the constituents that we need to change the status quo," Twohig says. "The recommendation now is to open up the wholesale market, and provide renewable producers full and complete access, so green producers can sell power to anyone they wish to sell to." Customers must pay for distribution and transmission, but can choose their own source.

New producers will always carry the disadvantage of having to charge for distribution and transmission, whereas taxpayers covered those expenses for established producers. "What has been defeating (green power) in the past has been monopoly regulations that didn't allow for independent power producers," Twohig says. "We're in an optimistic mode now in Nova Scotia. We're just not sure when we're going to see realization. We're where they were in Alberta five to six years ago."

With Manitoba Hydro's switch from coal to natural gas at its Selkirk generating plant, Manitoba is almost coal-free. Manitoba Conservation is testing hybrid electric vehicles and is backing New Flyer Industries in building a hydrogen fuel cell bus. It is also tapping



The fermentor: Tank used to process the sugars into what the industry calls "beer." This is then distilled into alcohol (ethanol).

methane from rotting organic matter in landfills to create 6.7 megawatts of electricity. But more significantly, Manitoba is looking to its historical symbol of prosperity to take it into the future, with its announcement that all gasoline sold there in future will contain 10 percent ethanol. The endless fields of waving grain that make the Prairies the breadbasket of the nation provide the feedstock. Ethanol produced at Mohawk's Minnedosa plant emits 40 percent less greenhouse gas than an equal amount of gasoline.

British Columbia is in the enviable position of producing 90 percent of its power from green sources, mainly hydro. The forestry sector powers itself with biomass. Orest Maslany, manager of Green Buildings B.C. said the government's use of power is typical of the rest of the province, a 90-10 split. A New Buildings Program and Retrofit Program reduce the government's own environmental impact and, in the process, foster the growth of its environmental industry.

Maslany told *Summit* that because the more economical hydro developments have already been installed, the province's goal through 2012 is to ensure only that 50 percent of new sources be green, depending on cost of development. On April 10, B.C. released an advisory committee's recommendations for a greenhouse gas action plan at (www.gov.bc.ca/em). Analysts are studying wave power, among other sources, saying the west coast of Vancouver Island alone has 8.25 GW of wave power capacity.

Since the height of the battle last fall between Alberta and the federal government over ratifying and implementing the *Kyoto Accord*, the Alberta government has softened its stand a little. Legislation introduced then to assert control over its natural resources has been rewritten to accommodate industry's need for consistency between provincial and federal regulations. What has not changed is Alberta's insistence that Ottawa recognize that each province faces different circumstances in reducing emissions. Alberta does want it to be known that, whatever its public posture, it is taking action. *MM*

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