

Fuel Cell Technologies Ltd.

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FCT's core business is the production of small-scale SOFC power systems that provide electricity and heat for "stationary applications" such as homes, small commercial enterprises, and remote sites. Part of the procurement for the Hammarby project includes the supply and installation of three of FCT's 5 kW SOFC systems. If all goes well, this deal will be followed by a blanket contract that could see as many as 8,000 additional SOFC units installed over the next eight years.

Hammarby Sjöstad, which is now under construction, will officially open August 15, 2002, to coincide with Stockholm's 750th anniversary and BoStad-02, an event showcasing the community as an ecological building project.

A winning formula

But exactly how will Hammarby's sewage be used to generate electricity and heat?

Stannard explains: "First the sewage is streamed, then combined in a giant digester to produce biogas — in this case mostly methane. About 15 to 20% of this methane is converted into a

hydrogen-rich gas which is fed to the fuel cells. When air is supplied to the other side of the cells, an electro-chemical reaction occurs that produces electrical energy and heat.

"The electricity is used to operate appliances and run services. Some of the heat is used to keep the system at operating temperature, and the rest is available for other uses, such as heating a residential community."

The power of networking

Stannard's simplified explanation belies a not-so-simple, but promising, technology that required substantial working capital to get off the ground.

"Many small firms with excellent products like ours may not realize the benefits of maintaining regular contact with a network of government officers. Sometimes government funding is only a phone call away.

"If we hadn't tapped into the IRAP (Industrial Research Assistance Program) or CANMET (Canada Centre for Mineral



One of FCT's units currently in operation and undergoing testing.

and Energy Technology Program) I don't think we'd be where we are today," admits Stannard. In its early days, FCT also made use of DFAIT's Program for Export Market Development (PEMD) to cover travel expenses, and enjoyed considerable funding support from DND on its underwater propulsion fuel cells.

Future generations

The innovative and nimble FCT now has a Joint Development Agreement with corporate giant Siemens Westinghouse Power Corporation of Pittsburgh, a world leader in, among other things, the design and manufacture of fuel cell stacks. FCT is also listed on most fuel cell databases, which has brought technology-hungry giants like Japan's NKK Corp., one of the world's largest steel makers, to the company's doorstep. In December 2001, FCT and NKK signed a comprehensive Letter of Understanding that is expected to

lead to a marketing and distribution agreement in which NKK will promote, sell, distribute, and service only FCT's SOFC products of sizes up to 50 kW in the Japanese and East Asian markets.

But in the fuel cell business, as with any high technology endeavour, adaptability is critical to success. "You need to grow and evolve or you're toast," says Stannard bluntly. "If you continue to produce something that the world doesn't want, or need, you'll end up as one more victim of 'buggy whip syndrome'. Hammarby is a testing ground for our vision of a world without greenhouse gases. Our success there will help prove that fuel cell technology is not only 'promising' — it's delivering."

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contractors, and after that it will be time to train the architects and builders."

With help like this, expect to see more Canadian-style healthy houses springing up in the Northwestern U.S.

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Canadian houses in Seattle — continued from page 3

proportion of the air leakage commonly found in North American homes.

"The workshop was a great way to get the message about Canadian building technology into the hands of code officials in the Northwestern U.S. region," says Sheehan. "Since the event, one code official who was unable to attend the workshop approved a project based on information provided by colleagues about Icynene®. We'll be taking it to the next level at a similar event for the Heating Ventilation and Air Conditioning (HVAC)

New investments in renewable energy Sweden confronts global climate change

Sweden takes climate change issues very seriously, in particular, reducing its greenhouse gas emissions. To demonstrate this strong commitment, the Swedish government has gone beyond the Kyoto Protocol to set Sweden's target level for 2008-2012 at 4% below the 1990 greenhouse gas emission levels. Approximately \$150 million has been allocated over the next three years to fund the Climate Investment Programme that will target the energy, transportation and waste sectors.

Sweden's 289 municipalities have been invited to tap into the new funds by submitting proposals for projects that will lead to reduced greenhouse gas emissions.

Local successes

The new programme represents a broadening in scope of the former Local Investment Programme (LIP), which was designed to stimulate ecologically sustainable development. As much as half of the total investments made as a result of that fund led to direct reductions in greenhouse gas emissions, and the government funding covered 30% of the total project costs.

The following are examples of projects that support renewable fuel sources and have received support from the LIP:

Linköping — Biogas (methane) produced from food processing waste is purified and then used to fuel 60 city buses and 80 other types of vehicles. Replacing diesel with biogas has reduced carbon dioxide emissions and improved air quality in the inner city.

Nynäshamn — Energy from bio

fuel is now used to produce steam for oil refinery processes used in the city's large petrochemical industry. The excess heat generated by these processes is channelled to the district heating system to heat the town.

EUROPE

Hammarby Sjöstad — This new housing project near Stockholm will use biogas produced by its local sewage plant to power fuel cells supplied by Canada's **Fuel Cell Technologies Ltd.** (www.fct.ca) — see cover story. The bio fuel will be used to co-generate electricity and heat which will then be directed to district heating networks. Hammarby Sjöstad will showcase this progressive residential project, including the fuel cell units, at an exhibition in August 2002.

A shift in energy systems

Although other renewable energy sources, such as wind power and bio fuel, are becoming more popular, the majority of electricity produced in Sweden is still generated at hydro-electric and nuclear power facilities. To accelerate the shift towards a more ecologically sustainable energy system, however, Sweden decided to close one of its 12 nuclear power reactors in 1999. The government is planning to close a second reactor in 2003.

With the deregulation of the Swedish electricity market in 1996, energy prices have risen slightly. On January 1, 2003, a new system involving "green certificates" will be introduced to stimulate the production of electricity from environmentally friendly and renewable

sources such as wind, bio fuel, solar power, geothermal energy, hydro and wave energy.

Decisions pertaining to energy policy in Sweden will not be made at the expense of the competitiveness of Sweden's industrial base: the energy supply to industry must be safe-guarded as changes are made to the energy system. Measures to improve Sweden's energy efficiency and reduce greenhouse gas emissions in energy-intensive industries will be introduced in upcoming government-funded programmes.

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