

# Energy Mission 2006

## Canadian delegation learns from England's best

**F**ROM THE MOMENT YOUR vehicle crawls out of England's Heathrow Airport onto the M4, you know that even the worst Canadian traffic jam cannot compare with what London commuters face every day.

London caused a sensation in 2003, when it began charging drivers to enter the downtown core. At first, traffic declined, but the number of cars is beginning to creep back up. In July 2006, London Mayor Ken Livingstone announced that drivers of high-polluting cars would soon pay more, jumping from about \$17 a day to as much as \$53.

Transportation was just one of the many issues discussed by Canadian delegates and their hosts as they toured London and four other cities as part of FCM's 2006 Energy Mission to England. FCM has organized these missions since 1995 to give Canadian municipal leaders a first-hand look at European energy and environmental best practices.

For example, Milton Keynes, a purpose-built "new city" in South East England, was designed as a planned community in the late 1960s. Touted as a "city of the future," it was among the first to incorporate efficient resource use into its community plan.

Today, Milton Keynes faces some extraordinary challenges. Among these, it is responsible for building 70,000 homes as part of a national government plan to build 1.1 million homes by 2016.

"Employment centres were originally designed to be spread out to avoid traffic congestion," said Michael Synott, Director of the Milton Keynes' Discovery Centre. "Public transit is therefore quite difficult, so we are looking to create a main transit line

through the middle of the city and cluster new housing around it."

If that sounds familiar to Canadians, the similarities don't end there. In fact, it was the similar challenges faced by the two countries that convinced FCM to visit England for this year's mission.

"We've taken energy missions to northern European countries that are much farther ahead than Canada in their policies, technology and thinking," said Sandor Derrick, Senior Manager with FCM's Green Municipal Fund.

"We chose England because England and Canada are both at the 'beginning' stages of sustainable development."

Acting Canadian High Commissioner Guy Saint-Jacques echoed those sentiments. "We're delighted that FCM chose England for the mission, because the British government has put sustainability at the top of its priorities."

### POLITICAL SUPPORT

The national priorities for all of the United Kingdom — England, Scotland, Wales, and Northern Ireland — include cutting greenhouse gas (GHG) emissions by 60 per cent by 2050, relative to 1990 levels, and generating at least 10 per cent of its electricity from renewable sources within four years. To support its goals, the government created the Department for Communities and Local Government (DCLG) and provided it with a budget of approximately \$80 billion over five years to invest in economic, social and environmental development in urban and rural communities.

"It's a huge pot of money with few rules attached on how to spend it," said Richard McCarthy, Director General of DCLG. "It gives us a lot of flexibility to use it in the most appropriate way."

The investment sends an important signal to local municipal leaders. Each city visited on this year's energy mission presented its climate change framework to the Canadian delegates and showed how national government funding is helping to deliver programs with real economic, social and environmental benefits.

"They've integrated all of their strategies in a very meaningful way," said Derrick. "When they talk about the triple bottom line, they really mean it."

Many municipalities are working with the private sector. Woking and Southampton, for example, established local energy companies in partnership with private companies to deliver renewable energy schemes including solar, wind, and geothermal.

London, too, has adopted the national emission and renewable energy use targets as its own. Allan Jones, Chief Development Officer for London's Climate Change Agency, is now hard at work delivering on the mayor's vision of having at least one zero-

### FCM 2006 Energy Mission at a glance

- Day 1** Presentations by London officials at Canada House
- Day 2** Presentations and a tour of Milton Keynes and the Beaufort Court "net zero" emissions building
- Day 3** Presentations and tour of Woking's solar and fuel cell installations
- Day 4** Presentations and tour of Norwich's wind energy installations
- Day 5** Presentations and tour of Southampton geothermal plant

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carbon development in each of London's 32 boroughs and installing up to 40,000 renewable energy projects by 2010.

"London has a huge property portfolio, so the potential to alter England's energy landscape is huge," said Jones. "The end game is a 100 per cent hydrogen economy, with most of the power to create hydrogen coming from waste that is currently land-filled or burned."

### LET'S GO SOLAR

In a country known more for rainy skies than sunny days, it may seem incongruous that solar energy has become so popular. But according to the Solar Energy Society (U.K.), each square metre of south-facing roof in England receives about 1,000 kilowatt-hours of sunshine in any given year.

Norwich, near the coast of the North Sea, has its share of solar installations, thanks to the work of the Community Carbon Reduction Project, or "CRed."

CRed helps residents take action on climate change and is delivered by the University of East Anglia's School of Environmental Sciences and the East of England Development Agency.

In one neighbourhood, CRed worked with residents to install solar-thermal systems for domestic hot water. "We bought the components in bulk so that it would be cheaper," explained Dr. Keith Tovey, the university's Energy Science Director. "The response was overwhelming and the scheme was oversubscribed in 22 minutes. The initial payback was between 12 and 15 years, but with energy prices soaring that's been cut to about seven years."

As of March 2005, Woking, southwest of London, had cut its corporate emissions by 80 per cent and generates 82 per cent of its own energy. "Our energy-efficiency agenda began in 1990 and was driven by economics," said Ray Morgan, Chief Executive of Woking Borough Council. "We now measure in carbon savings."

Woking was the first community in the U.K. to install a fuel cell combined heat and power (CHP) plant and has more than 90 per cent of all the installed solar photovoltaic (PV) in the country. In all, Woking boasts 13 renewable energy sites, seven of which have both PV and combined heat and power.

The Brockhill seniors centre is a case in point. Most of the power generated by the centre's rooftop PV and CHP systems is used on site. "We export the surplus at night and import any additional power we need during the day," explained Mick Company, Woking's Climate Change Coordinator.



FROM TOP TO BOTTOM: Innovative street lighting in Woking, southwest of London; the Canadian delegation taking a train to Norwich, in eastern England; Dr. Michael Synnott addresses the delegation in Milton Keynes, a city in southeast England that was one of the first English cities to incorporate efficient resource use into its community plan.



STUDIO E ARCHITECTS

The Beaufort Court building combines multiple renewable energy systems on one site, including wind, solar, biomass and hot water storage.

Woking's fuel-cell CHP plant, located at Woking Park, uses natural gas to create hydrogen that then generates all of the electricity and thermal energy needed for the park's buildings and pool complex.

## WIND MILLS EVERYWHERE

With an estimated one-third of Europe's total offshore wind resource, wind energy plays an important role in the U.K.'s renewable energy policies.

"Wind energy is relatively stable if you compare it to a conventional power station, which can lose 1,200 MW of energy in as little as 30 seconds," Dr. Tovey said, noting the energy could be quickly lost if a power plant failed.

"Wind can't lose that amount in such a short period of time because the energy is distributed."

Nowhere was this more evident than in Norwich, where wind turbines seem to sprout from every hill. Norwich is also home to Scroby Sands, one of the largest offshore wind farms in the U.K.. Rising from the sea, 30 two-megawatt turbines deliver electricity to more than 41,000 area homes.

## MERGING TECHNOLOGIES

It's one thing to advocate for renewable energy; it's quite another to implement it, as the mission learned at Beaufort Court. This historic property, once an egg farm, is now the headquarters for the Renewable Energy Systems Group (RES).

"We wanted a sustainable building but we also wanted to see what could be done with an historic building," said Stephen Ballant, RES's Asset Manager.

The building has on-site solar thermal and PV installations, a 225-kilowatt wind turbine, and a biomass boiler, which burns an energy crop grown on land adjacent to the building. The crop is miscanthus, a tall perennial plant otherwise known as elephant grass. Energy from the boiler is stored in an underground 14,000 square-

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metre tank and is used for heating, while groundwater, funneled through beams inside the building, is used for cooling.

It's not all good news. "It was very expensive to retrofit, and the building is still very much a work in progress," said Bill Watt, Environmental Engineer with Max Fordham & Partners, who helped develop the building's energy systems.

In a frank discussion with the Canadian delegates, Watt outlined several problems: the water storage tank leaks; the energy crop did not grow well in its first year; the building's heating and cooling requirements exceeded those forecast; and, at one point, the solar array inverters stopped working.

"We have a lot of heritage buildings, and it's a challenge to find ways to retrofit them," said Amery Boyer, Chief Administrative Officer with the Town of Annapolis Royal, Nova Scotia. "The Beaufort Court building was a good example of multiple energy approaches, especially as they apply to heritage buildings, and of what can and does go wrong."

### HOT ROCKS

During the 1980s, when energy prices were steadily rising, the U.K.'s Department of Energy began drilling geothermal wells believing that underground hot-water wells could augment or even replace conventional heating fuels. One of the largest wells discovered was in Southampton, a major port city in the south of England.

"Southampton's well is one of the few that was exploited because it was so close to a dense urban area," explained Mike Smith, Chief Executive with Utilicom, one of the U.K.'s leading energy management firms. By using the geothermal energy, the city saves more than \$600,000 a year in energy costs and cuts emissions by 11,000 tonnes.

The well lies one mile below ground. The water is contained in geothermal sandstone and has a water temperature of 76° C. Dubbed the 'Hot Rocks' project by the local news media, water is pumped to a geothermal plant, where it is used to produce heating, cooling and electricity for the city hall, several office buildings, a hospi-

tal, four hotels, one university, the Quays recreation complex, a shopping centre, and public and private sector housing.

"The system works very well, and we have had no problems with continuity of supply," said Andy Veal, Operations Manager for the Quay's complex. "In the six years since the system was installed, we have had only four hours of downtime."

### SHARING EXPERTISE

Many of the delegates were impressed by the candor of their British hosts and their willingness to discuss the problems of sustainable development projects as much as their successes.

"The British know that there's a lot of catch up that has to happen and are willing to share what they know," said Ken Scott, Mayor of Spruce Grove, Alta. "It's what I love about municipal politics...it doesn't matter what country you're in, we share information."

The national government recently passed legislation requiring local authorities to reduce waste back to 1995 levels. Southampton city council took advantage of having the Canadian delegation in town and asked some of the representatives from Nova Scotia to make a presentation about Halifax's waste-management program.

"This was the first time such a 'reverse' presentation has occurred on any FCM mission," said Brian Smith, Chief Administrative Officer with King's County, N.S., adding that Southampton council was impressed by the level of citizen involvement in the program.

Sandor Derrick noted that it was this type of peer-to-peer learning that makes FCM's energy missions so successful. "I was very pleased to see so much interaction among the delegates," said Derrick. "It suggests to me that delegates learn as much from each other as they do from the host country." ■



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