Ontario looks at European-style district heating

The Ontario Ministries of Housing and Energy have jointly announced an $88,000-grant to study district heating for a new community of about 20,000.

"District heating shows definite promise of increased fuel efficiency and reduced costs to the consumer," Housing Minister Claude Bennett said. "With some 20 per cent of our annual energy budget being used in our homes, my ministry is vitally interested in domestic energy conservation."

(District heating is where a number of separate buildings – houses, stores, offices, hospitals – in a given area are warmed by a single boiler or other type of heating plant located nearby.)

Doug Wells, executive director of the ministry's technical services division, recently returned from a tour of district heating installations in Sweden, Denmark and Finland. He was a member of an 11-man study group sponsored by the energy ministry.

"A major fact emerging from the visit," said Wells, "is that district heating is economically and technically feasible over a broad range of heat-load and heat-transmission requirements."

The purpose of the tour was to compare the European experience with conditions in Ontario. The countries visited have been actively promoting district heating systems for 25 years and have accelerated their development in light of sharply rising energy costs.

How it works

District heating is simply an extension of the idea which led to basement furnaces replacing fireplaces in every room.

A central boiler plant eliminates the need for individual furnaces, chimneys, basement storage tanks and countless individual deliveries of fuel.

In addition, the large central plants can operate at greater efficiencies, thus reducing costs and pollution.

However, applying this fairly simple plan on a large scale can be a complicated business involving technical, financial, social and legislative considerations, to name a few.

Ontario has a number of district heating plants, generally serving large institutions such as universities or hospitals. Ontario Housing Corporation uses central steam heat for part of Regent Park in downtown Toronto. In London, Ontario, a large part of the central business core is heated by a central steam heat unit.

Alternative fuels considered

District heating plants can burn heavy oil at roughly half the cost of the light oil required for domestic oil furnaces. They also have a potential for alternative fuels such as gas, coal, peat, forest waste and even urban garbage. And the hot-water systems are suitable for the addition of solar heating in the future.

The use of nuclear energy for district heating is another possibility. The rationale is that the heat associated with electricity production should be used rather than dissipated. Nuclear power plants can be designed to produce both heat and electricity, with only a slight drop in electrical output.

Nuclear plants present siting problems and sometimes meet public resistance on grounds of safety. Sweden and Finland have jointly developed and built a low-temperature nuclear reactor that overcomes these problems to some degree. This low-temperature reactor is called SECURE (Safe Environmentally Clean Urban Reactor). It generates heat only and is designed for cities of 50,000 to 100,000 inhabitants. The first such unit was completed last year. It opens up the possibility of locating such heat-only nuclear plants near urban areas, because the low temperatures and low pressures provide a high safety margin. Such reactors are also moderate in cost and comparable to the cost of fossil-fuelled district heating plants.

District heating is a technology still developing. At first the hot water was moved at high pressure through large steel pipes with a direct bleed to individual homes. The high-pressure hot water created some safety hazard in the home. This was eliminated through the use of heat-exchangers, which transferred the heat to the home water system operating at low pressure.

Energy-saving guides

The Federal Government's new energy conservation program for major household electrical appliances, known as "Energuide", will inform consumers of the amount of energy certain products use.

The program is supported by a new regulation to the Consumer Packaging and Labelling Act, which requires an energy consumption label to be prominently displayed on all refrigerators manufactured after September 30, 1978. Other appliances will follow in the months ahead. The "Energuide" label will state the kilowatt-hours *per* month (kWh) energy consumption of each model as tested in accordance with Canadian Standards Association (CSA) standards.

The label should encourage manufacturers to continue to improve the energy consumption of their appliances in order to become more competitive in the marketplace.

What it costs

The Federal Government estimates the entire program will cost $36 million, including the costs to manufacturers, CSA, retailers, utilities and governments of developing and producing labels; the costs of testing by manufacturers and CSA; the cost of labelling, administration and compliance activities and the expense of advertising and promotion. Over the period of the program, it amounts to $6 *per* refrigerator.

The projections of both program cost and consumer benefit are based on annual sales of 600,000 refrigerators.

Labelling regulations to establish the energy consumption of other major household electrical appliances – freezers, dishwashers, electric ranges, clothes washers and dryers and oil and gas furnaces – will be introduced when proper test methods are developed.

"Energuide" saves money

The "Energuide" program was developed to meet a predicted shortfall in energy supply, a shortfall that will exist until at least mid-way through the 1980s. By contrast to expensive efforts to find and develop new sources of energy, "Energuide" should reduce energy demand quickly and at relatively low costs.

Consumers could save $18 a year *per* refrigerator or $180 over ten years by taking advantage of the "Energuide" label, which will appear on refrigerators this fall according to Mr. Allmand, who predicts that the benefit to the nation of the energy consumption labelling of refrigerators could be as much as $234 million in today's dollars during the next ten years – the average life of a refrigerator.