

Reducing GHG Ron Tolmie July 9/07

Ottawa's Strategic Directions plan calls for a reduction in the community's greenhouse gas production amounting to 20% below the 1990 levels by the year 2012. To do that we will have to cut GHG emissions by more than a factor of two over the coming five years. Even if that ambitious objective is relaxed Ottawa will still need an explicit year-by-year plan ⁽¹⁾ and progress reports in the Quarterly Performance Report.

Community CO₂ emissions for 1990, 1998 and 2007

Tonnes of eCO ₂ ⁽²⁾			
Sector	1990	1998	2007 business as usual forecast
Buildings	2,437,000	4,582,000	5,139,000
Transportation	2,353,000	2,476,000	3,068,000
Waste	1,238,000	1,968,000	2,430,000
Total	6,028,000	9,026,000	10,639,000

As shown above buildings are by far the largest contributor, so to achieve the target we will need to retrofit a very large part of our existing building stock. Employing better technology in new buildings wouldn't do the job by itself.

Grants

Both the federal and the provincial governments have announced grants totalling up to \$10,000 for switching homes to renewable energy or to upgrade to more efficient systems. Unfortunately those programs are flawed. For example, I live in a condominium composed of nearly 200 electrically heated residences organized in groups of 8 per building. From a technical, economic, ecological or administrative point of view this is an ideal application for a communal ground source heat pump (GSHP) system, but when you read the fine print of the grant programs the grants would yield **minus** \$62.50 per home. To add insult to injury we are eligible for substantial grants if we switch to oil or natural gas instead of using a renewable energy source!

If the City is to achieve its GHG objectives it must object to such nonsense. Even more importantly, it should support provisions for group projects, especially where the administrative infrastructure already exists as it does with condominiums. If a single project takes 200 homes off of fossil fuels and also saves substantial amounts of electrical power the City can take giant leaps towards its goal instead of moving in microsteps. GSHP's are economically viable even without grants. Their problem, which is generally shared with other renewable energy sources, is their relatively high capital cost. The energy itself is free, clean and unlimited in quantity, and the maintenance cost is low, so the real limitation is the management problem of getting over the initial deterrent. The province has provided funds to some of the GTA municipalities to provide interest free loans to cope with this barrier. The City of Ottawa should press for a similar

arrangement.

There are some substantial extra advantages to building GSHP systems that serve blocks of homes rather than individual homes:

- (1) The electrical energy consumption is reduced by about a factor of five where GSHP's replace electric heating
- (2) The consumption of natural gas is eliminated altogether
- (3) The reductions occur in the peak winter and summer demand periods
- (4) Such larger systems can store energy efficiently so they operate 100% of the time, without the need of backup
- (5) Such systems are invisible, last for generations and require almost no maintenance
- (6) Such systems can be installed with relatively little inconvenience to the homeowners
- (7) Both the construction costs and the administrative costs are much less for block installations
- (8) Large GHG improvements could be achieved relatively quickly by retrofitting existing communities
- (9) A single system provides for all three energy intensive functions, heating, cooling and DHW
- (10) There is no need for sealing, insulation, etc., because the energy is free, clean and is unlimited in quantity

Downtown

High rise buildings require much more cooling and relatively less heat than homes. Toronto has installed an innovative system, the Enwave system, that stores winter cold and uses it to air condition 46 large buildings, including the Air Canada Centre and (soon) Queen's Park. I have proposed to the City of Ottawa that it should do likewise ⁽³⁾ providing a community service that could be used by the City itself and by the federal government and for privately owned buildings. Like the Enwave system this would be innovative because the means of storing the cold would be different, but the principle, the operating temperatures, and the HVAC systems within the buildings would be identical. Unlike the Enwave system, the service proposed for Ottawa can start on a small scale so there is very little risk in undertaking such a project.

Between them, these two suggestions would go a long way towards retrofitting the existing Ottawa building stock and in providing attractive options for new buildings.

Recommendations

- (1) Create an explicit plan for achieving the GHG reduction objective.
- (2) Monitor progress via the quarterly Performance Report
- (3) Work with senior government levels and the private sector to implement suggestions like those above

References:

- (1) Background Report on the Energy Plan for Toronto, June 4, 2007
- (2) Ottawa 20/20, 6., Strategic Directions
- (3) www.sustainability-journal.ca Feb to July/07