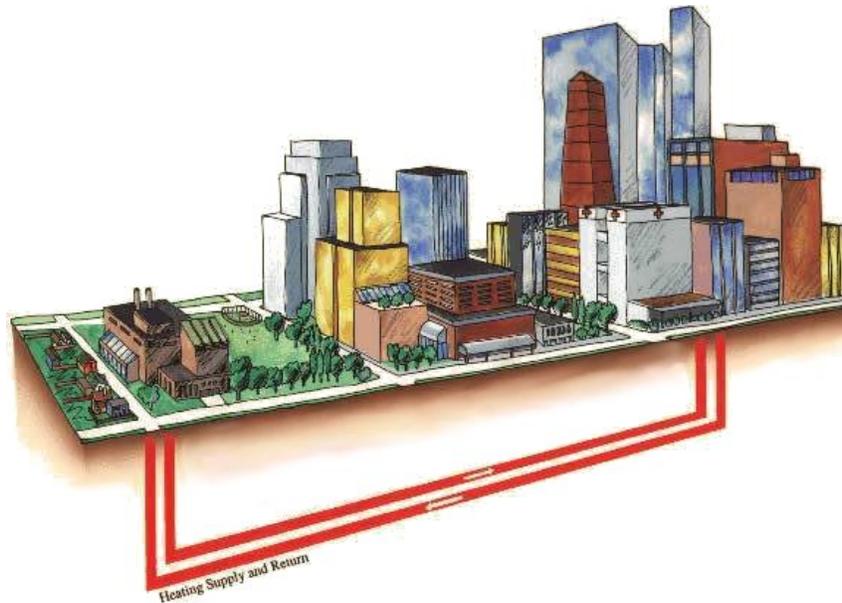


# Burlington Renewable District Heating Technical Feasibility Report - May 2011



**EVER-GREEN ENERGY™**

**Ever-Green Energy, LLC**

Saint Paul, MN

651.290.2812

[www.ever-greenenergy.com](http://www.ever-greenenergy.com)

## **Burlington District Energy Services Citizen project team (BURDES)**

Jan Schultz, coordinator

Harry Atkinson

Lisa Marchetti

Jeffrey Frost

Damon Lane

John Irving, BED

Bruce Seifer, CEDO

[BURDESinfo@burlingtontelecom.net](mailto:BURDESinfo@burlingtontelecom.net)

The City of Burlington, VT has a unique opportunity to initiate a district heating system based on a readily-available source of renewable thermal energy at the wood-fired McNeil Generating Station. Burlington is a community that values conservation, effective resource utilization, and local solutions – the same principles that make the recovery and deployment of underutilized thermal energy at McNeil a compelling opportunity. This underutilized heat from McNeil is more than sufficient to meet the full space heating and hot water heating needs of the businesses and residents of downtown Burlington. This energy is an untapped resource for a community energy system modeled after successful systems elsewhere in the US and in countries such as Denmark and Sweden where conservation and environmental stewardship are high priorities. Such a community energy system will place Burlington among a small group of forward-looking communities that enjoy the benefits that result from the use of locally-derived renewable energy sources.

The Final Report will be posted on CEDO's website when available:

<http://www.cedoburlington.org/business/>

## **Benefits include:**

- Reduction in dependence on fossil fuels for meeting the heating needs in the community. This tends to improve energy price stability and energy security.
- Expenditures for energy stay in the local community with the associated economic and employment benefits. These are dollars that would otherwise leave the community for imported natural gas or oil or other fossil fuels.
- Environmental benefits of reduced greenhouse gas emissions and other emissions as a result of switching to renewable fuel and thermal energy recovery which reduces the amount of natural gas and heating oil consumed for building heating.

A medium temperature hot water system is technically feasible for the City of Burlington. The economic analysis depends on how such a system is implemented such as the scope of the system, the market penetration achieved, the rate at which the district heating system expands and the density of customer load during that expansion, and the credit and financing availability and other capital sources.

If the district heating system could achieve substantial market penetration such as is outlined in Alternative 2 or Alternative 3, there is sufficient load under these alternatives to support a district system without subsidy. In fact, the economics of Alternatives 2 and 3 compare favorably with successful systems such as the one in St. Paul, Minnesota. The economics of Alternative 1, a small system with many of the buildings along Pearl Street to serve as “anchor customers” for a later expansion, cannot be accomplished without outside subsidy in the form of grants or favorable financing. However, the opportunity of a system such as is described in Alternative 1 should not be ignored as the customer profile in that area would serve very well as a starting point for a more expansive system that could be self sufficient economically. There is a distinct economy of scale in district heating systems. Therefore, the economics of the larger systems evaluated are often more attractive than the economics of a smaller system. As more heating load is added to the system, the operation and maintenance costs for the system are spread over a larger customer base, which lowers the cost per unit of energy delivered. As would be expected, as these operation and maintenance costs are spread over a larger base, and the average cost per unit of energy is reduced, the district service becomes more compelling to other prospective customers. This dynamic suggests that pursuit of Alternative 1 and finding a way to overcome the early deficit in financing could result in a system that expands rapidly as the costs are shared by more and more customers.

This study concludes that there is an opportunity to supply competitively-priced, renewable energy from McNeil Generating Station via a district system at current and projected natural gas and heating oil prices in Burlington. Next steps include (1) additional verification of the suitability of customer buildings to accept district heating service, especially for the buildings in Alternatives 2 and 3, (2) initiation of discussions with FAHC and UVM/Trinity Campus regarding technical suitability and intent to utilize district energy services to establish feasibility of Alternative 3, (3) perform more detailed business planning and establish a structure for the organization of the district heating entity/utility, and (4) begin the process of community engagement throughout the Burlington community to gain support for this exciting project. As these next steps progress, a decision to invest in the detailed engineering design activities for the system will follow.