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[MAINE COMPASS: District energy may have a warm future in Central Maine](#)

Tom Tietenberg

District energy involves the centralized production of heating and/or cooling services and increasingly includes the generation of electricity as well.



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District heating has a long history in Europe. In Denmark, for example, more than 60 percent of space heating and water heating is supplied by district heating.

Locally, we only have to look at the district energy plant at Colby College, a plant that generates both heat and electricity from biomass.

The availability of new technologies, plus significant changes in energy prices, have created new possibilities for one or more district energy plants in Central Maine.

The potential benefits to the community from district energy include lower and more stable energy costs, economic development attracted by those lower costs, a lower dependency on imported fuels, and fewer emissions.

How can district energy continue to lower heating and cooling costs once buildings are made as energy efficient as possible? District energy plants are usually much more efficient than the smaller, disbursed, typically much older, heating units they replace.

Modern district heating plants have two main sources of efficiency: economies of scale in energy service production and multiple valuable services produced from the same input energy.

Economics of scale simply refers to the fact that large boilers typically can yield higher efficiencies than smaller boilers. (Efficiency refers to the percentage of total energy input to a

machine or equipment that results in useful services and is not wasted as useless heat.)

Modern combined heat and power plants typically run the produced steam through a turbine to generate electricity before the heat is distributed, producing a double benefit from the same process. Trigeneration, an even more efficient process, simultaneously generates electricity, heating and cooling from the same original energy source.

District energy plants, in some cases, also can use lower-cost fuel. For example, the Colby plant, which substitutes locally sourced wood for imported oil, is expected to save the college about \$1 million annually after it pays for itself in about six years.

District energy plants also usually result in lower emissions, not only because the larger plants are more efficient (less fuel is needed to produce a given level of energy services), but also because the larger plants offer more cost-effective opportunities to control emissions.

What type of fuel would be used? At this point this remains an open question. Biomass is an attractive option, but many others are possible. If the natural gas pipeline proposed for Central Maine is built, that could be incorporated, as could methane captured from the existing waste treatment plant or even methane from algae that would be locally grown specifically as an energy source.

What is the status of this project? Currently, the SustainMid-Maine Energy Committee has a subcommittee that meets every two weeks with broad participation, including engineers, economists, city managers, project managers, energy educators, energy facility managers, community development specialists and interested community members.

The first order of business, almost completed, has been to identify the thermal and electrical loads in the area.

That information then can be used in a pre-feasibility study to scale the potential project and to begin to narrow the set of fuels and technologies being considered.

The next step would be to secure funding for a feasibility study that would characterize both the most desirable options and their associated costs and benefits. Upon completion of that study, it would be possible to identify the feasible potential locations of one or more district energy plants.

Given the high and unstable costs of our dependence on imported oil, this may well be district energy's time.

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