

District Energy

District energy is one element of the Capital District Master Plan. Like other Master Plan elements, it is a bridge for cooperation and mutual benefit between the State of Vermont and the City of Montpelier.

What is district energy?

District energy is the use of local energy resources to meet community needs. In Montpelier, the core concept is *district heating*: the use of a central heating plant to supply heat and hot water to many buildings throughout the community. When the system is fueled with locally produced waste wood it benefits the broader community and becomes a *community energy system*.

In a district energy system, buried hot water or steam pipes are used to distribute thermal energy from the central plant to the customers. Each subscriber pays only for the energy they use. The system functions much like a municipal water supply system. Most subscribers will no longer need to use their own heating plants and fuel storage tanks.

What is the existing Capital District plant?

The Capital District of state buildings in Montpelier has been served by a district heating system for over fifty years. The plant is located behind 120 State Street, and is recognized by its tall brick stack. In addition to state buildings, it also serves the new Chittenden Bank building.

The Capital District Plant has used wood chips for its main fuel for the last fifteen years. The wood chips can come from either of two sources:

- Chipped sawmill waste wood
- Low-grade wood chipped in the forest as harvest by product



120 STATE

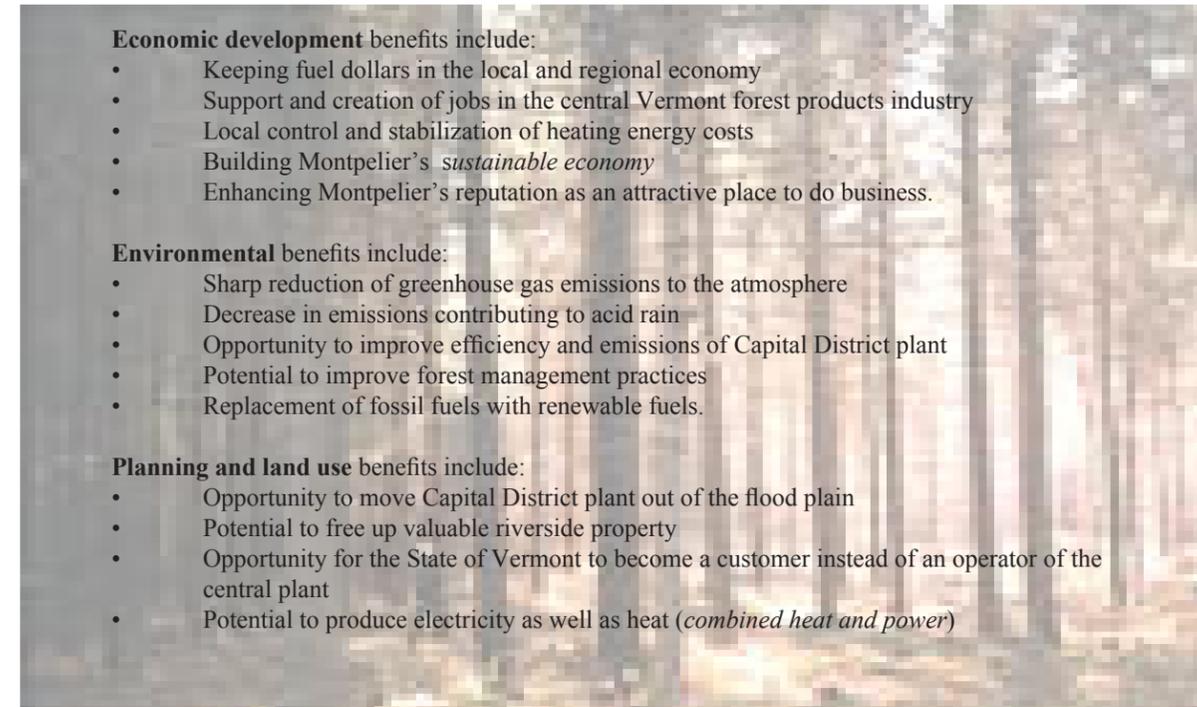
HEATING
PLANT

BIKE
PATH

W I N O O S K I

What are the benefits of a modernized or expanded system?

The Master Plan offers an opportunity for the benefits of wood-fired district energy to be extended to public and private buildings in Montpelier's downtown and nearby areas.



Economic development benefits include:

- Keeping fuel dollars in the local and regional economy
- Support and creation of jobs in the central Vermont forest products industry
- Local control and stabilization of heating energy costs
- Building Montpelier's *sustainable economy*
- Enhancing Montpelier's reputation as an attractive place to do business.

Environmental benefits include:

- Sharp reduction of greenhouse gas emissions to the atmosphere
- Decrease in emissions contributing to acid rain
- Opportunity to improve efficiency and emissions of Capital District plant
- Potential to improve forest management practices
- Replacement of fossil fuels with renewable fuels.

Planning and land use benefits include:

- Opportunity to move Capital District plant out of the flood plain
- Potential to free up valuable riverside property
- Opportunity for the State of Vermont to become a customer instead of an operator of the central plant
- Potential to produce electricity as well as heat (*combined heat and power*)

What would an expanded system look like?

District energy is nearly-invisible infrastructure. Distribution pipes can be buried under sidewalks or streets, in front or in back of buildings, or can be run through basements of connected buildings to save digging.

A community energy system would be able to serve major buildings (schools, city buildings, National Life of Vermont, large commercial buildings) as well as smaller commercial and institutional structures and apartment buildings. In the early phases of development, it is generally not cost-effective to serve single-family residences.

Benefits:

- Least cost site for expansion of district heating
- Utilize existing infrastructure (building, fuel storage, boilers, chimney)
- Close to downtown and State buildings
- Easy to provide steam to existing heat distribution piping for State buildings

Drawbacks:

- Existing boilers functional but inefficient
- Existing boilers have relatively poor stack emissions
- Plant located in the flood plain
- Takes up prime riverside real estate (including space for fuel delivery trucks)
- Combined-heat-and-power potential limited (joint production of heat and electricity)

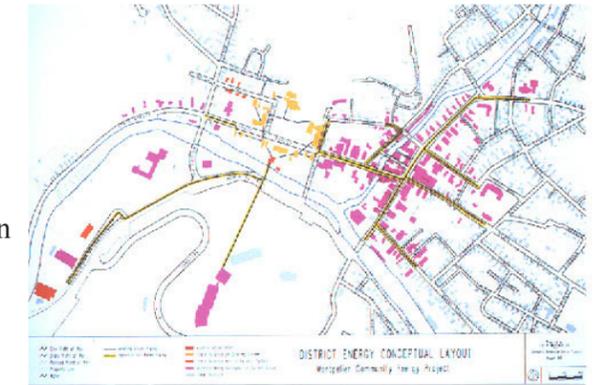
New Plant Location

While reusing the existing central plant will involve compromises in the efficiency and operation of the plant, a new facility in a new location allows for an optimal system to be built. A new central plant could be a model wood-burning facility, with high-efficiency, low-pollution boilers and the possibility of producing heat and electricity.

Benefits and drawbacks of a new central plant location are presented Below

Benefits:

- Could be located out of downtown, out of the flood plain
- Frees up riverside location for other uses
- Gets fuel delivery truck traffic out of Montpelier
- Easier to build state-of-the-art system: high efficiency, low emissions, combined-heat-and-power production
- Provides opportunity to upgrade state steam distribution system to hot water



Drawbacks:

- The further from downtown, the higher the capital cost (for buried piping)
- More expensive than recycling existing plant
- May be difficult to find a good site that is also available for use
- More difficult to continue providing steam to state buildings

Economic Development Benefits:

Using wood in an expanded Capital District energy system will:

- Increase income in Central Vermont by \$1.2 million annually
- Increase local, state and federal tax revenues by over \$200,000
- Create 25 jobs

(Using data from a 1994 DOE-funded study, *Economic Impact of Wood Energy in the Northeastern States.*)

How big will it be?

- Number of Montpelier buildings to be served: 150
- Square footage to be served:

Existing State buildings	500,000 sq. ft.
New State buildings	240,000 sq. ft.
Downtown buildings	2,000,000 sq. ft.
- Central plant fuel consumption:

Wood chips	26,500 tons
Fuel oil	300,000 gallons