Earth Source Heat at Cornell University

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Cornell is planning to demonstrate the direct use of low-carbon geothermal heat (Earth Source Heat, or ESH) at its Ithaca campus to provide heat for the campus as a part of implementing its Climate Action Plan. This demonstration focuses on job creation in energy and agriculture. ESH provides jobs for energy workers. Agricultural jobs are linked to both the energy supply (supplemental biomass heating) and demand (controlled environment agriculture, or CEA) components. ESH will enable new year-round biomass and CEA markets, replace fossil fuels, and create a broad range of short- and intermediate-term development jobs and long-term operational jobs.

Cornell is attractive for demonstration due to 1) representative regional geology with sufficient geothermal resources; 2) heating demand representative of NY State ; 3) existing district energy infrastructure to buildings and laboratories serving 30,000 people (including State-supported colleges); 4) opportunities for multiple cascading uses/applications; and 5) active collaborations with academic, industrial, and government partners interested in this technology. Geothermal resources will be used to meet seasonal base-load/average heat demands. The overall system will be optimized using thermal storage and heat pumps; and identify cascading uses for the heat. The integration of biomass for peak heating with cascading end-use to maximize the economic benefit to NY while promoting sustainability on campus.

The US DOE has funded a 2-yr ESH Feasibility Study. At the present time Cornell is seeking funding for the next, critical phase: drilling and development of a demonstration deep geothermal well pair, which is key to attracting private funding for market development (see attached support letters).

The MEng project will deal with the system analysis of various geothermal – biomass design options. The work will involve a collaboration with CBE and EAS faculty as well as with engineering staff from Cornell's facilities management group.