

# Vermont ELECTRIC PLAN 2005

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are present year around, offer the most economically attractive applications of CHP because the equipment can have a higher utilization rate. However, in Vermont, where heating is a six month or more proposition, CHP for space heating has merits as well. Because these CHP systems are located “within the fence” they offer the advantages of distributed generation as well.

The University of Vermont (UVM) has been evaluating a possible co-generation plant in recent years. This project could present many of the positive attributes of cogeneration by providing affordable electricity, being close-to-load, capture of waste heat. UVM is in the process of expanding campus facilities and view the prospect of co-generation as a means to serve incremental load and even a more efficient way to cool buildings during the summer session.

### **Others**

A number of other technologies exist that are appropriate for distributed utility plan applications. The most established distributed technology is the reciprocating engine/generator set. These engines run on a variety of fuels, come in sizes from five kW to tens of MWs, and have installed costs ranging from \$500/kW to \$1,500/kW. These sets are mass-produced, are supported by established sales and maintenance infrastructures, and are now available as residential and commercial cogeneration packages. The drawbacks to this technology include relatively high emissions, high noise, and frequent maintenance.

One of the fastest growing distributed technologies is that of wind turbines. Recent technological advances have increased the efficiency and reliability of wind turbines while lowering their costs. Installed costs range from \$1,000/kW to \$3,000/kW. While wind turbines have no fuel requirements and zero emissions, there are potential noise and visual aesthetic concerns, depending on the specific application. Another class of distributed technology is the energy storage system, with the most common energy storage device being the battery. Batteries store energy in chemical form and like other storage devices can be used for peak shaving, spinning reserve, outage support, and voltage and transient stability. While not yet viable for storing large amounts of energy, batteries are currently used for uninterruptible power supplies, support for off-grid PV and wind systems, and emergency backup for lighting and controls.

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## **RECOMMENDATIONS**

### **RENEWABLES**

- ▶ Vermont regulators should establish proceedings for adopting appropriate recommendations of the Advisory Commission on Commercial Wind Energy.
  - ▶ The Departments and State agencies should support the next-stage of developments resulting from the investigation of the Advisory Commission on Commercial Wind Energy into permitting issues. Recommendations identified Act 248 review as the appropriate vehicle for reviewing commercial wind generation projects, 10-mile radius notification, notifications requirements to municipalities and planning commissions, and a decommissioning fund for site restoration. The recommendations also include the use of an ombudsman contact for the Section 248 review process.
  - ▶ Vermont should continue to encourage and promote development of net-metered renewable energy applications in appropriate locations.
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- ▶ Vermont should promote the use of PV systems in those markets where they can be cost effective substitutes for line extensions or temporary installations.
  - ▶ Vermont utilities should evaluate, develop, and implement well-designed and properly focused voluntary green-pricing programs.
  - ▶ The DPS and State government should evaluate financial incentive mechanisms to foster renewable energy deployment.
  - ▶ Electric utilities should explore potential for appropriate new renewable resource acquisitions as existing energy sources and contracts expire.
  - ▶ Vermont utilities should work with merchant generators and developers of renewable energy projects to encourage and overcome artificial barriers to the development of cost-effective viable renewable energy projects.
  - ▶ State regulators and utilities should monitor renewable technology improvements and assess cost-effectiveness and applicability for Vermont. Their federal legislative delegation should be encouraged to seek additional funds for advanced technology to support renewable energy development in the state.
  - ▶ State regulators should encourage utilities and independent power producers to investigate the feasibility of retrofitting existing wood burning generators with fluidized bed systems to improve the emissions characteristics.
  - ▶ Utilities and the DPS should evaluate incentives and viable means to enhance deployment of co-generation systems.