APPENDIX 1 - ABBREVIATIONS LIST and GLOSSARY

I. ABBREVIATIONS LIST

AAMA	American Automobile Manufacturers Association
AFUE	annual fuel utilization efficiency
AFV	alternative fuel vehicles
ANR	Vermont Agency of Natural Resources
AOSIS	Alliance of Small Island States
AOT	Vermont Agency of Transportation
APCD	Vermont Air Pollution Control Division
ARPA	Advanced Research Projects Agency
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.
BC	base case
BTU	British Thermal Unit
CAAA	Clean Air Act Amendments
CABO/MEC	Council of American Building Officials, Model Energy Code
CAFE	Corporate Automobile Fuel Efficiency Standards
CEP	Comprehensive Energy Plan
CFCs	chlorofluorocarbons
CH	hydrocarbons
CH_3CH_2OH	ethanol
CH_3OH	methanol
CH_4	methane
C&I	commercial and industrial
CNG	compressed natural gas
CO	carbon monoxide
CO_2	carbon dioxide
CONEG	Coalition of Northeastern Governors
CVPS	Central Vermont Public Service Corporation
CVR	conservation voltage regulation
DHC	district heating and cooling
DMV	Vermont Department of Motor Vehicles
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DPS	Vermont Department of Public Service
DSM	Demand side management
DU	distributed utility
EED	Vermont Department of Public Service, Energy Efficiency Division
EEM	Energy Efficient Mortgage Program
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
EPAct	National Energy Policy Act of 1992
EPRI	Electric Power Research Institute
ERH-VT	Energy Rated Homes of Vermont

ESCO	energy service company
ETBE	ethyl tertiary butyl ether
EV	electric vehicle

EWG	Exempt Wholesale Generator
FERC	U.S. Federal Energy Regulatory Commission
GHG	greenhouse gas
GMP	Green Mountain Power Corporation
GRP	gross regional product
GW	GigaWatt (one million kiloWatts)
GWh	GigaWatthour (one million kiloWatthours)
GSP	gross state product
GWP	Global Warming Potential
HEAT	Vermont Home Energy Audit Team
HELP	Vermont Home Energy Loan Program
HP	horsepower
HQ	Hydro-Québec
HVAC	heating, ventilation, and air conditioning
ICP	Institutional Conservation Program - Schools and Hospitals
IES	Illuminating Engineering Society, Inc.
IPCC	Intergovernmental Panel on Climate Change
IPP	independent power producer
IRP	integrated resource plan
ISTEA	Intermodal Surface Transportation Efficiency Act
kW	kiloWatt (1,000 Watts)
kWh	kiloWatthour (1,000 Watthours)
kW-yr	kiloWatt-year
L&I	Vermont Department of Labor & Industry
LCC	life cycle costing
LCIP	least cost integrated resource plan
LCTP	least cost transportation planning
LEV	California Low Emissions Vehicle Program
LIHEAP	Low Income Home Energy Assistance Program
LNG	liquid natural gas
LOTS	local option taxes
LPG	liquid petroleum gas
LUST	Leaky Underground Storage Tank Program
MIT	Massachusetts Institute of Technology
MPG	miles per gallon
MSA	Metropolitan Statistical Area
MTBE	methyl tertiary butyl ether
MW	MegaWatt (100 kiloWatts)
MWh	MegaWatthour (100 kiloWatthours)
N_2O	nitrous oxide
NARUC	National Association of Regulatory Utility Commissioners
NEGC	New England Governors' Conference, Inc.
NEPEX	New England Power Exchange
NEPOOL	New England Power Pool
NETI	New England Transportation Initiative
NOPR	Notice of Proposed Rule Making

NO_x	nitrogen oxides
NRC	U.S. Nuclear Regulatory Commission
NUG	non-utility generation or generator
NYPA	New York Power Authority (formerly PASNY)
OECD	Organization for Economic Cooperation and Development
OH	Ontario Hydro
OPEC	Organization of Petroleum Exporting Countries
OPIC	Overseas Private Investment Corporation
ORNL	Oak Ridge National Laboratory
OTA	U.S. Office of Technology Assessment
OTC	Ozone Transport Commission
OTR	ozone transport region
PASNY	See NYPA
PC	preferred case
PCB	polychlorinated biphenyls
POM	polycyclic organic materials
PM10	particulates under 10 microns
PSB	Vermont Public Service Board
PSC	Vermont Public Service Commission
PUHCA	Public Utility Holding Company Act
PURPA	Public Utility Regulatory Policies Act
PV	photovoltaic
PVE	Petroleum Violation Escrow Account
QF	qualifying facility
REA	National Rural Electrification Act
REAP	Regional Energy Assessment Project
REMI	Regional Economic Models, Inc.
RFP	Request For Proposal
RPC	Regional Planning Commission
SCADA	system control and data acquisition
SCETS	State Comprehensive Enhanced Transportation System
SEMP	School Energy Management Program
SO_x	sulfur oxides
SPR	Strategic Petroleum Reserve
TBTU	trillion British Thermal Units
T&D	transmission and distribution
TDM	transportation demand management
TDR	transfer of development rights
TLEV	transitional low emissions vehicle
TSP	total suspended particulates
ULEV	ultra low emissions vehicle
VECTOR	Vermont Energy Construction Training Opportunities and Resources
VEEP	Vermont Energy Education Program
VELCO	Vermont Electric Power Company
VEPPI	Vermont Electric Power Producers, Inc. (formerly Vermont Power Exchange (VPX))
VGS	Vermont Gas Systems, Inc.
VHFA	Vermont Housing Finance Agency

VIECAP	Vermont Industrial Energy Conservation Advisory Program
VISMT	Vermont Institute for Science, Math, and Technology
VMT	vehicle miles traveled
VOC	volatile organic compound
VPPSA	Vermont Public Power Supply Authority
V.S.A.	Vermont Statutes Annotated
WEC	Washington Electric Cooperative
ZEV	zero emissions vehicle

II. GLOSSARY

Access charge: In a restructured electric utility environment, an access or wires charge could be levied on a power supplier, or its customers, for access to a transmission or distribution system. It is a charge for the right to send electricity over another's wires.

Acid precipitation: Acid rain and snow pose a serious environmental risk for Vermont's lakes, streams, and forests. Vermont's precipitation is, on average, always slightly acidic.

Anthropogenic emissions: Any emissions resulting from human activities.

Avoided cost: A utility's avoided cost is its incremental costs of electric energy or capacity or both that the utility would generate itself or purchase from another source if it did not use an alternative resource. This alternative resource may be a specific supply or demand side resource under consideration, or it may be a generic decrement to electric load, as appropriate to a given analysis.

Baseload: The minimum load over a given period.

Baseline forecast or base case: The baseline forecast is used to outline future energy demand under a business-as-usual scenario and show where opportunities lie for energy savings and environmental improvement. A base case does not describe the most likely future. It describes what would most likely happen if current trends continue and if no changes occur in state and national energy policy. Other scenario, incorporating new policies, new technologies, alternative economic conditions, and other assumptions, are contrasted to the base case.

Biodiversity: Biological diversity or the variety of species in a given area.

Biomass: Organic matter that is available on a renewable basis including forest residues, agricultural crops and wastes, wood and wood waste, animal wastes, livestock operation residue, and aquatic plants. Useful energy can be derived from the direct combustion of biomass or flammable gases derived from biomass for generation of electricity, mechanical power, or industrial process heat. In this report, biomass usually refers to wood and wood waste.

British Thermal Unit (BTU): The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. It is commonly used as a measurement for the energy content of different fuels. One kWh equals 3,412 BTU.

Capacity: The maximum power that a machine or system can produce or carry under specified conditions.

Capacity factor: The ratio of the average load on a machine or equipment during a specified time period to the capacity rating of the machine or equipment.

Carbon tax: A tax on fossil fuels based on the individual carbon content of each fuel. Under a carbon tax, coal would be taxed the highest per MBTU, followed by petroleum and then natural gas.

Carbon cycle: The sum of all reservoirs and flows of carbon on Earth. The flows tend to be cyclic in nature. Carbon removed from the atmosphere (one reservoir) and converted into plant tissue (another reservoir) is returned back into the atmosphere when the plant is burned.

Carbon dioxide: A colorless, odorless, incombustible gas formed during respiration, organic decomposition, and combustion -- particularly combustion of fossil fuels. Carbon dioxide is the largest contributor to global warming. In 1990, carbon dioxide was responsible for about 2/3rds of the global warming brought about by human-caused greenhouse gases. While burning fuels more completely can reduce the emissions of many other pollutants, it cannot reduce carbon dioxide emissions. They can be reduced by decreasing energy use, using more efficient furnaces, vehicles, etc. and switching to fuels that emit smaller amounts of carbon dioxide.

Carbon monoxide: A colorless, odorless, extremely poisonous gas, CO is formed by incomplete combustion of carbon or a material containing carbon such as gasoline. Carbon monoxide is an air pollutant as well as a contributor to smog.

Carbon reservoir or sink: A physical site within the carbon cycle where carbon is stored, such as the atmosphere, oceans, Earth's vegetation and soils, and fossil fuel deposits.

Chlorofluorocarbons: A family of inert gases, including CFC-11, CFC-12, and CFC-13. CFCs are a family of chemicals that contribute to the breakup of ozone molecules in the stratosphere, depleting the ozone layer that protects the earth from damaging ultraviolet radiation.

Climate: A statistical collection and representation of the weather conditions for a specified area during a specified time interval, usually decades.

Clean Air Act: 42 U.S.C. Section 7401 and following as amended established national air quality emission standards, to be implemented by participating states, which are designed to reduce air pollution. Congress enacted the Clean Air Act because of growing awareness of the serious public health effects resulting from air pollution.

Cogeneration: The simultaneous production of electric power and heat energy. A cogeneration system might include a combustion turbine that produces electricity and a boiler or heat recovery steam generator that recovers waste heat from the turbine and produces hot water or steam for heating or industrial processes.

Combined cycle plant: A combined cycle plants utilize the most efficient large-scale thermal electric generation technology available today. Combined cycle technology uses the excess heat produced by a combustion turbine to power and additional turbine that produces even more electricity. Using the waste heat from the combustion turbine to produce more electricity dramatically improves the efficiency of the plant. Combined cycle plants and advanced combustion turbines have environmental advantages over conventional oil- or coal-fired generators. Since they are more efficient, they require less fuel and have fewer emissions per unit of electricity produced.

Combustion turbine: Combustion turbines operate in the same manner a jet engines in aircraft. In a combustion turbine, fuel is introduced into a combustion chamber together with compressed air. The fuel burns and the expanding exhaust gases pass out through the turbine,
turning the blades to provide power. Most combustion turbines currently use distillate oil or natural gas, but work is advancing on ways to extend utilize coal and wood with a gasification process. Turbines see their greatest use at times of peak electricity loads, because they are relatively inexpensive to build but more expensive to operate. Smaller, more versatile, more efficient turbines that use advanced metals, new

blade designs, and high compression ratios similar to day's jet engines are in the works.

Commercial sector: Retail stores, offices and businesses that use energy primarily for lighting, heating and air conditioning.

Cooperative utility: A group of persons organized to supply electric energy to members in a specified area, generally exempt from federal income tax laws and usually financed by REA.

Cream-skimming: Cream-skimming occurs when a DSM program or measure is implemented that has a high energy-savings-to-investment ratio instead of implementing a DSM program or measure with a smaller ratio but larger total energy savings.

Cycling (intermediate) unit: A generating unit whose output is varied over time (usually hours or days) to follow changes in demand between base and peak periods.

Deforestation: Converting forest land to other vegetation or uses, such as cropland, pasture, and when dams are constructed, reservoirs.

Delivered energy use: As compared with primary energy use, delivered energy use is the measure of the energy consumed as it enters (or is delivered to) the consumer's home, building, or vehicle. Delivered consumption is the measure most often used in reports of energy use, as it provides a baseline for comparison with other sources.

Demand side management (DSM): The planning, implementation, and monitoring of electric utility activities designed to reduce power strategy of influencing customer use of electricity to reduce the utility's load when those load reductions are more cost-effective than available supply side resources. Because DSM is a way of meeting the utility's load requirements, DSM opportunities are referred to as energy resources.

Demand side resources: Efficiency or conservation measures. Energy savings can be considered a resource in the sense that they make it possible to serve increased demand without obtaining new supplies.

Deregulation: The modification or elimination of regulation from a previously regulated industry or sector of an industry.

Direct access: The ability of a retail customer to purchase electricity directly from the wholesale market rather than through a local distribution utility. (See Retail competition.)

Disaggregation: The functional separation of the vertically integrated utility into smaller, individually owned business units (i.e., generation, transmission, distribution). (See Divestiture.)

Distributed generation: A planning concept in which small scale, perhaps renewable, generation and modular storage facilities are distributed throughout the transmission and distribution system.

Distillate fuel: Refined fuel oil, grades one, two, and four, which are primarily used for space heating are one type of distillate fuel. The other type is highway diesel engine fuel, uses in diesel cars and trucks,

railroad engines and some farm machinery.

Distribution: Delivering electric energy from the transmission or bulk power system to the consumer's home or business through low voltage distribution lines; also that portion of utility plant used for that purpose, or expenses relating to that plant.

Distribution Utility (Disco): In a restructured environment, the Disco is the regulated electric utility entity that constructs and maintains the distribution wires connecting the transmission grid to the retail customer. The Disco can also perform other services such as aggregating customers, purchasing power supply and transmission for customers, billing customers, and offering other regulated energy services to retail customers.

Divestiture: In a restructured environment, divestiture is the stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Most commonly associated with spinning-off generation assets so they are no longer owned by shareholders that own the transmission and distribution assets. (See Disaggregation.)

Efficiency: Efficient energy production, delivery, and use minimize waste and therefore requires fewer resources. Energy efficiency does not reduce comfort or convenience, but instead meets the same needs with less energy and environmental damage.

Emission factor: A coefficient that relates actual emissions to activity data as a standard rate of emission per unit of activity. Emission factors are often based on a sample of measurement data averaged to develop a representative rate of emission for a given set of operating conditions.

End use: The light, heat, cooling, refrigeration, motor drive, or other useful work produced by equipment that uses energy or its substitutes.

Energy efficiency: Producing more work from the same amount of energy/electricity: decreasing energy requirements while customer end use service is held constant. Programs designed to use electricity more efficiently.

Energy forecast models: This Plan is based on a pair of linked computer models that forecast the course of Vermont's economy and energy demand. The forecast model developed by Regional Economic Modeling, Inc. (REMI) provides the economic and demographic assumptions that are used by an energy forecasting model, ENERGY 2020. Both models have the ability to perform separate policy simulations or to work together to produce an integrated analysis.

Energy intensity: Relative indicator for the amount of energy used, on a per person or per unit output basis, and a measure of the economic importance of energy use for a particular period or state in particular the amount of energy required per unit of a particular product or activity, usually expressed in term of BTU per $ or gross state product.

Energy services company (ESCO): Businesses specializing in financing and installing energy efficiency measures for large energy consumers.

Ethanol: In addition to mixing with gasoline to form gasohol, ethanol can be burned directly in

automobiles. Ethanol boosts the performance and efficiency of engines, but it requires more storage capacity or more frequent refillings because it contains less energy per gallon of fuel.

Exempt wholesale generator: A company engaged exclusively in the generation or selling of electricity at wholesale. Under provision of the federal EPAct of 1992, and EWG is exempted from the organizational restrictions mandated in PUHCA.

Externalities: The costs (and benefits) of energy that are not paid for by utilities or their customers. Externalities are the environmental and other costs (or benefits) that result from the generation, transmission, distribution, or reduction in use of energy, and that are external to the economic transaction between the utility supplier and the customer, whether wholesale (distribution utility) or retail (ratepayer).

Externality adder: An adjustment used in cost-benefit analyses in utility least cost planning to reflect the external costs of polluting energy sources.

Fossil fuel: A solid, liquid, or gaseous fuel material that has been formed in the ground by chemical and physical changes in plant and animal residues under high temperature and pressure. Coal, petroleum, natural gas, and any fuel derived from them are fossil fuels.

Gasification plant or system: Gasification technologies are some of the most efficient and cleanest large-scale technologies currently being developed. They operate by turning fuel sources such as coal, wood,and other biomass sources into a gaseous fuel for use in combustion turbines or combined-cycle technologies.

Gasohol: Gasohol is a blend of 90% gasoline and 10% ethanol (grain alcohol). It is made by fermenting corn, but is also can be produced from other biomass sources.

Global warming: Also known as global climate change, this term refers to the potential warming of the earth and the accompanying climate changes caused by "the greenhouse effect." The greenhouse effect occurs when gases such as water vapor, carbon dioxide, methane, nitrous oxide, and CFCs trap and absorb heat in the earth's' atmosphere that otherwise would have escaped into space. These gases act as the glass in a greenhouse does, allowing sunlight into the greenhouse but trapping some of the heat that normally would radiate away, thereby warming the greenhouse.

Global Warming Potential (GWP): The Global Warming Potential (GWP) of a greenhouse gas is a comparison of its heat trapping ability compared to that of carbon dioxide during a 100 year time frame. The GWP of one ton of methane is 24.5 times that of one ton of carbon dioxide; the GWP of one ton of nitrous oxide is 320 times that of carbon dioxide (EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-1994*, 1995, ES-2). The original source of these values is IPCC, *Radiative Forcing of Climate Change. The 1994 Report of the Scientific Assessment Working Group of IPCC: Summary of Policy Makers*, 1994. This work is an update of the previously published values of 11 for methane and 270 for nitrous oxide found in IPCC, *Climate Change: The Supplemental Report to the IPCC Scientific Assessment*, 1992. Due to timing of modeling, research, and publication of this Plan, GWP values of 11 and 270 were used for calculating carbon dioxide equivalents.

Greenhouse gas: Any gas that absorbs infrared radiation in the atmosphere.

Greenhouse gas intensity: The amount of greenhouse gases emitted.

Heat rate: The number of BTU's of the source fuel required to produce a Kwh of electricity.

High-level radioactive waste: High level radioactive waste consists of spent fuel and must be managed for many thousands of years in order to protect present and future generations. (See Low-level radioactive waste.)

Hydroelectric power: Electricity generated by turbine driven by falling water. There are several types of hydro sites. Run-of-river facilities generate power as the water flows through the facility. Sites that can operate as ponding facilities can store water behind dams for use during peak load periods.

Independent power producer: IPPs are non-utility companies that generate electricity. Some IPPs are authorized as Qualifying Facilities (Qfs).

Industrial sector: The manufacturing, construction, mining, agriculture, fishing, and forestry establishments.

Integrated resource planning (IRP): A public planning process and framework within which costs and benefits of both demand and supply side resources are evaluated to develop the least-total-cost mix of utility resource options. In many states, such as Vermont, IRP includes a means of considering environmental damages caused by electricity supply/transmission and identifying cost effective energy efficiency and renewable energy alternatives. (See Least cost integrated planning.)

Investor-Owned Utility (IOU): A company, owned by stockholders for profit, that provides utility services.

kiloWatthour (kWh): A unit of energy equivalent to using one kiloWatt of electricity for one hour, equal to 3,412 BTUs.

Least cost integrated planning (LCIP): The effort to meet an electric utility's projected demand at the lowest overall cost to society including unpriced environmental costs. In this long range planning process, energy efficiency is included as an energy source. LCIPs are also known as integrated resource plans (IRP).

Life cycle costing: A process in which the life cycle total costs (including maintenance and energy costs) of appliances, equipment, and vehicles are taken into consideration as part of the purchasing decision.

Load: The amount of service or electric energy delivered to or required at a specific point or points on a utility's system. Load is determined by customer end uses.

Load shape: A load shape is a graphical representation of electricity use (including transmission losses) for each hour of the day.

Lost opportunity programs: Vermont utilities' DSM programs fall into two broad categories: "lost opportunity programs" encourage customers to make energy efficient choices when they buy or do major

renovations a home, commercial building, or industrial facility, and when they purchase new appliances or machinery. Over the long term, more efficiency can be gained with lost opportunity programs. Many efficiency savings can only be captured cost-effectively during new construction or when customers make appliance and machinery changes. Finally, lost opportunity programs save energy and money not only through immediate savings, but also because the need for retrofit measures in the future is reduced. The other major type of DSM program is retrofit programs.

Low-level radioactive waste: Low level radioactive waste includes contaminated metals, filters, resins, and other materials used a nuclear plants. Most low level radioactive waste decays to safe levels within 100 years.

Marginal cost: Cost to produce one more unit.

Market based price: A price set by mutual decisions of many buyers and sellers in a competitive market.

Methane: Methane is the chief component of natural gas. It is also a serious greenhouse gas, trapping 11 times more heat in the atmosphere than an equivalent amount of carbon dioxide traps.

Methanol: Like ethanol, methanol is an alcohol fuel in which oxygen in the fuel helps ensure more complete combustion. Methanol can be made from natural gas, coal, oil, or biomass.

Municipal utility: A provider of utility services owned and operated by a municipal government.
National Energy Policy Act of 1992 (EPAct): The culmination of several years of effort to define a national energy strategy, signed into law by President Bush in 1992.

New England Power Pool (NEPOOL): NEPOOL was established in the early 1970s to provide a power pool in which many of the day-to-day operations of power generation are closely integrated with the other operations of New England utilities to improve reliability and reduce cost.
Nitrogen oxides: Nitrogen oxides emissions lead to the formation of ground-level ozone, the major constituent of smog, and contribute to acid precipitation, which acidifies lakes and steams and harms forests. Gasoline and diesel use emit more nitrogen oxides per unit of energy used that any other fuel in Vermont. Nitrogen oxides can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.

Nitrous oxides: Nitrous oxides are a potent greenhouse gas, trapping 270 time more heat in the atmosphere that an equivalent amount of carbon dioxide emissions.

Operating reserve: Refers to quick amount of generation capability utilities can bring on line within 10-30 minutes in response to supply or demand emergencies.

Ownload electricity supply: Vermont's ownload electricity supply represents the amount of electricity that Vermont utilities would have used if they operated independently of NEPOOL. Ownload supply refers to energy generated in or delivered to Vermont.

Oxygenated gasoline: With two additives that increase the oxygen content of gasoline, combustion is improved, especially in older vehicles. The additives are ethyl tertiary butyl ether (ETBE) and methyl

tertiary butyl ether (MTBE), which is regularly used to boost the octane of fuels.

Ozone transport region: Ozone pollution is carried from one state to another by prevailing winds, particularly in the Northeast. The Clean Air Act Amendments of 1990 call for establishment of ozone transport regions where emissions control measures are required.

Particulates: A wide array of small pieces of solid and liquid matter found in the atmosphere, including soot, dust, organic matter, and other materials.

Peak load: The largest demands in the load under consideration during a specified period.

Performance based regulation (PBR): Any rate setting mechanism which attempts to link rewards (general profits) to desired results or targets. PBR sets rates, or components of rates, for a period of time based on external indices rather a utility's cost of service. PBR is a form of rate regulation that is intended to provide utilities with better incentives to reduce their costs than does cost of service regulation.

Performance contracting: Paying for capital investment with energy savings, typically under the direction of an energy service company (ESCO).

Photovoltaic power: Photovoltaic cells convert solar energy into electricity when sunlight excites electrons in the cell's silicon material. Photovoltaic cells can be located on the roofs and sides of buildings and homes or on land set aside for the purpose. On a much smaller scale, they can be located on many kinds of appliances and devices, from street lights to calculators.

Poolco: Poolco refers to a specialized, centrally dispatched spot market power pool that functions as a short term market. It established a short term market clearing price and provides a system of long term transmission compensation contracts. It is regulated to provide open access, comparable service and cost recovery.

Power pool: Two or more interconnected electric systems planned and operated to supply power more reliably and economically for their combined load than would be possible separately. A power pool coordinates short term operations to maintain system stability and achieve least cost dispatch. Coordinating short term operations includes the aggregation and firming of power from various generators, arranging exchanges between generators, and establishing (or enforcing) the rules of conduct for wholesale transactions. The pool may own, manage and/or operate the transmission lines (wires) or be an independent entity that manages the transactions between entities.

Primary energy use: As compared to delivered energy use, primary energy use is measure of the delivered energy consumption plus the energy lost in the generation, transmission, and distribution or electric energy and natural gas. Electric generation plants that use fossil fuels and nuclear power require roughly three times the amount of energy input as is produced in output, and this is reflected in measures of primary energy use.

Proven reserves: A quantity of a natural resource that geological and engineering information indicates with reasonable certainty can be recovered in the future from known deposits under existing economic and operating conditions.

PURPA: The Public Utility Regulatory Policy Act of 1978. Among other things, this federal legislation requires utilities to buy electric power from private "qualifying facilities," at an avoided cost rate. This avoided cost rate is equivalent to what it would have otherwise cost the utility to purchase or generate that power themselves. Utilities must also offer customers who choose to self-generate a reasonably priced back-up supply of electricity.

Qualifying facility (QF): To become a QF, an independent power supplier had to produce electricity with a specified fuel type (cogeneration or renewables) and meet certain ownership, size, and efficiency criteria established by the Federal Energy Regulatory Commission. More specifically, QFs are power plants that use renewable fuel sources or cogeneration systems to generate up to 80 MW or use cogeneration systems of any size and deliver at least 5% of their waste heat energy to a thermal host for heating or production processes. Under PURPA, QFs were allowed to sell their electric output to the local utility at avoided cost rates.

Radiative forcing: Changes in the global balance of incoming solar radiation and outgoing infrared radiation caused by a radiative forcing agent, such as clouds and greenhouse gases. This results in changes in the global climate.

Reformulated gasoline: Reformulated gasoline is produced by altering the chemistry of gasoline in the refining process. Reformulated gas burns cleaner than unleaded gasoline. It contains less butane so it is less likely to evaporate and escape into the atmosphere during storage and while fueling vehicles. It also contains less benzene (a carcinogen) and contributes less to smog.

Reliability: Electric system reliability has two components - adequacy and security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customer at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities.

Renewable energy: Energy obtained from sources that, if managed properly, are essentially inexhaustible.
Renewable fuel sources: Renewable fuel sources are those that can regenerate (such as wood) or those that are not depleted by use (such are wind and solar). Using these renewable resources sustainably means consuming them in a manner that does not place economic, social, and environmental burdens on future generations or limit their ability to meet their needs. Therefore, renewables such as wood and other biomass sources must be managed so that they regenerate and do not cause extensive harm to the environment. Although fossil fuel sources regenerate, they do so over time frames that are so vast that they are non-renewable for all practical purposes.

Research and Development (R&D): Research is the discovery of fundamental new knowledge. Development is the application of new knowledge to develop a potential new service or product. Basic power sector R&D is most commonly funded and conducted through the Department of Energy (DOE), its associated government laboratories, university laboratories, the Electric Power Research Institute (EPRI), and private sector companies.

Residential sector: Private households, which use energy primarily for space heating, water heating, air conditioning, lighting, refrigeration, cooking, and drying clothes.

Resource mix: Generating units, power contracts and DSM programs used to meet needs of electricity customers.

Restructuring: The reconfiguration of the vertically integrated electric utility. Restructuring usually refers to separation of the various utility functions into individually operated and owned entities.

Retrofit programs: Vermont utilities' DSM programs fall into two broad categories: "retrofit programs" encourage customers to modify their existing homes, businesses, and appliances to reduce their electricity use. The other major type of DSM program is the lost opportunity program.

Retail competition: Also called retail wheeling or direct access, this system allows more than one electric provider can sell to retail customers, and retail customers are allowed to buy from more than one provider. In other words, retail competition gives power producers access to a utility's transmission lines and distribution system for the purpose of selling electricity directly to the utility's customers. Electricity customers could then choose among different power suppliers. The stated goals of retail competition are to increase efficiency and lower costs by spurring competition. However, it is not clear whether retail competition would achieve these goals without significant new rules and protections. (See Direct access and Wholesale competition.)

Retail wheeling: (See Direct access, Retail competition, and Wholesale competition).

Retrofit program: A program operated by a utility directed toward upgrading existing equipment, systems or operations to a higher level of efficiency. Typically achieved by utilities offering technical assistance, financial incentives or direct installation of equipment. A program targeting the comprehensive upgrading of energy consuming systems, such as commercial lighting, is an example.

Risk adjustment: An adjustment, up or down, to the cost of a supply or DSM option to reflect its effect on the uncertainty or riskiness of the total supply/demand portfolio. (Vermont PSB Docket 5270 has for the present established a presumption that there should be a 10% *downward* risk adjustment to the cost of DSM measures in least cost planning.)

Sequester: To isolate and remove something or the process by which carbon dioxide is removed from the atmosphere and retained for some period in a carbon reservoir.

Strandable Costs: Also referred to as Stranded Costs/Assets/Investments or Embedded Costs Exceeding Market Prices. In a restructured electric utility environment, strandable costs represent the uneconomic portion of a utility's generation assets (e.g., its regulatory assets, purchased power contracts, and generation plants). Currently, utilities recover the embedded costs of these assets from customers through cost-based rates. However, the uneconomic portion of these costs may become "stranded" in a competitive market to the extent that utilities can not recover them from customers. Regulatory questions involve whether such costs should be recovered by utility shareholders, customers, or both, and how they should be recovered.

Stranded benefits: Public interest programs and goals which could be compromised or abandoned by a restructured electric industry. These potential "stranded benefits" might include: environmental protection, fuel diversity, energy efficiency, low-income ratepayer assistance, and other types of socially beneficial programs.

Strategic petroleum reserve: An oil storage reserve created by the U.S. Government in 1975 in response to oil supply disruptions. The purpose for the strategic petroleum reserve was to stabilize the economy and ensure the continued supply of oil during times of future disruptions. The SPR currently holds 592 million barrels.

Sulfur oxides: Sulfur oxides result from burning any fossil fuel, but the combustion of coal produces the largest amount (per unit of energy used). Sulfur oxides are health hazards and significant contributors to acid rain.

Supply side resource: A resource option that can provide additional electrical energy or capacity to the utility. Supply side resources include utility owned generating facilities; electricity purchased from other utilities, cogenerators, or independent third parties; transmission or distribution improvements; and the life extension or upgrading of existing facilities of the utility through technological improvements, including fuel switching, for more efficient production and delivery of electricity.

Sustainable: A term used to characterize human activities that can be undertaken in such a manner as to not adversely affect environmental conditions (soil, water quality, climate) necessary to support those same activities in the future.

Transmission: Transporting electricity in bulk from the sources of supply to other principal parts of the system or to other utility systems, also that portion of utility plant used for transmission.

Transportation sector: Cars, buses, trains, etc. that are involved in the process of moving people and goods.

Turbine: An enclosed rotary type of prime mover in which the heat energy in steam or hot gas is converted into mechanical energy by a high velocity flow against successive rows of radial blades fastened to a shaft.

Unbundling: Disaggregating electric utility service into its basic components and offering each component separately for sale with separate rates for each component. Unbundling is a critical feature in restructuring the electric utility environment. For example, generation, transmission, and distribution could be unbundled and offered as discrete services.

Utility: A public service business or regulated entity that exhibits the characteristics of a natural monopoly. For the purposes of electric utility restructuring, a utility refers to the regulated, vertically integrated electric company.

VELCO: Vermont Electric Power Company, a company owned by some of Vermont's retail utilities that oversees common transmission facilities and acts as Vermont's representative to the New England Power Pool (NEPOOL).

Vermont Electric Power Producers, Inc. (VEPPI): The current state purchasing agent designated by the PSB to aggregate the electric output of Vermont QFs, and to allocate the energy and costs to Vermont utilities at the statewide avoided cost rates as calculated by DPS and approved by PSB. As necessary, VEPPI enforces performance provisions. (Formerly the purchasing agent was Vermont Power Exchange (VPX.))

Vertical integration: An arrangement whereby the same company owns all the different aspects of making, selling and delivering a product or service. In the electric industry, it refers to the historically common arrangement whereby a utility would own its own generation plants, transmission system, and distribution lines to provide all aspects of electric service.

Volatile organic compounds: VOCs are often toxic, and they contribute to ground-level ozone. Ground-level ozone, the major component of smog, is formed from the combination of VOCs and nitrogen oxides as they react in the presence of heat and sunlight.

Watt: The electrical unit of power, equal to one Ampere flowing continuously across a potential of one Volt. One horse-power equals about 746 Watts.

Wheeling: The transmission of electricity by an entity that does not own or directly use the power it is transmitting. Wholesale wheeling is used to indicate bulk transactions in the wholesale market, whereas retail wheeling allows power producers directs access to retail customers. This term is often used colloquially as meaning transmission.

Wholesale competition: Wholesale competition within the electric industry generally means that each utility can purchase wholesale power from a variety of sources, and in turn suppliers or producers of power can sell to any utility. (See Retail competition.)

Wholesale power market: The purchase and sale of electricity from generators to resellers (who sell to retail customers) along with the ancillary services needed to maintain reliability and power quality at the transmission level.

Wind energy: The kinetic energy of wind converted into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity for distribution.

Wires charge: A broad term which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires. (See Access charge.)

World ultimate resource reserves: For petroleum, this is the technically recoverable oil resources assuming existing technology, including reserves already used, proved reserves, future additions to reserves in existing fields, and estimated undiscovered resources. The world ultimate resource reserves for petroleum are estimated at 2.3 trillion barrels.