UVM Energy Policy Series
February 9, 2004

Presented by:

Patty Richards
Director of Resource Planning
Burlington Electric Department
About Burlington Electric Department (BED)

- Municipal (not for profit)
- Serve the City of Burlington (19,600 customers)
- Long standing commitment to renewable power and energy
- Power Supply
  - Long term focus
  - Focus on fiscal prudence and environment
  - Focus on sustainability and economic development
  - Focus on balanced approach of competing interests
This chart demonstrates the impact BED's energy efficiency efforts have had on annual energy consumption in Burlington. The area between the red and green lines represents the amount of energy saved by Burlington consumers from 1989 through 2003 from energy efficiency implementation.

Without energy efficiency Burlington's load would have been 15% more in 2003 than it was in 1989.

Burlington's load is actually 2% less in 2003 than it was in 1989!
Burlington’s overall rates are 11% lower than statewide average

- In 2002 BED’s average rate was 9.7 cents/kwh
- Vermont statewide average in 2002 was 10.87 cents/kwh
- Burlington’s residential rates are 26% lower than the statewide average
- Burlington’s average business customer rate was 9.78 cents/kwh
- Since 1995 Burlington’s business rates dropped 19%
- BED increased renewable power from 31% in FY2002 to 40% in FY2003
2002 Avg New England State Utility Rates

- Rhode Island
- Burlington Electric Dept
- Connecticut
- New England
- Massachusetts
- New Hampshire
- Vermont
- Maine

cents/kwh
Economics of Wind

• Long term purchase power commitment necessary to build wind
  – Developers looking for 15 to 20 years
  – Allows cost to be spread over time and reduces cost of energy

• Price for wind power is falling
  – 1979: 40 cents/kwh
  – 2000: 4 to 6 cents/kwh

• Vertically integrated utilities appear to be best suited to buy significant wind resources
  ✓ Purchases can be done on scale that make economics work
  ✓ Long term (15 to 20 years)
  ✓ Retail choice not spurring development of wind
    ✓ Individual buying power too small
    ✓ Retail consumers do not commit long term (15 – 20 years)
Economics of Wind

- PPA gives known long term fixed cost
- No fuel adjustment clauses in wind contracts
- Energy price escalates at a rate less than inflation
- Wind resource adds fuel diversity to power supply
- Wind farms are a composite of many small generators
  - minimizes entire plant loss risk
  - turbine maintenance cycled - not all units out at once
Economics of Wind

- COST counts
- Bigger is better (economies of scale)
- REC sales key - lowers cost of energy
- REC sales limit ability to claim power as wind/renewable
- REC’s managed properly can lower energy costs from wind projects
- Don’t have to sell all REC’s from project – sell some/keep some
Wind vs Wholesale Markets

- Wholesale market costs:
  - variable
  - volatile
  - driven by natural gas trends (price and perceived availability)
  - uncertain
- Wholesale electricity markets moved to new paradigm that makes load pay congestion costs (known as locational marginal pricing)
- Farther away generation is from load greater risk of congestion costs
- Construction of major new natural gas power plants in ME, MA, CT, and RI. Known in Vermont. Need adequate TRANSMISSION to get it here.
- New England peaks at 25,000 MW
- Regional generation at 32,900 MW
- Almost experienced rolling black outs in January 2004 – only 22,000 MW peak load
- Locational Marginal Pricing (LMP) creates an incentive to obtain generation close to load
- Building wind in Vermont can act as risk hedge to LMP’s
- Management of REC’s can lower energy costs from wind resources
New England Spot Electricity Market
vs
Niagra Falls Ave Spot Gas Price Index

Power and gas are 86% correlated

Data Source:
Natural Gas: Natural Gas Exchange (www.NGX.com)
New England Spot Electricity Market: www.iso-ne.com

2002 Sources of Energy in New England

- Natural Gas (single fuel) 29%
- Natural Gas (dual fuel) 9%
- Coal 12%
- Nuclear 25%
- Hydro 5%
- Oil 3%
- Wood/Refuse 5%
- Other 3%
- Pumping load & adjustments 2%
- Net Flows (imports - exports) 7%

Data Source: ISO-NE website
Prepared by Burlington Electric Department 9/2003
Burlington entered a long term purchase power agreement with Equinox Wind Partners

- Construction pending receipt of permits
- Commercial operation between 2003 and 2005
- Total 9 MW nameplate rating
- 23,500 MWH
- 7% of Burlington’s energy
- Equivalent to 4,000 Burlington homes
- Adds diversity to power supply
- In-state energy
- Local jobs and tax benefits
- No air emissions
- Renewable
- Off-sets fossil fuel generation in New England
- Sale of environmental attributes through REC’s (Renewable Energy Credit) lowers cost of energy coming from site
Summary – The Economic Case for Wind

- Risk Hedge
- Cost of Energy can be managed by sale of REC’s
- Power supply diversity
- Closer to load is better
- Ancillary economic benefits to towns with wind turbines
- Wind is part of a balanced power portfolio
- Wind is part of a forward thinking vision
- Wind does contribute to rate stability
Thank You

Questions?