



Wind Power in New England

A fact sheet series from the Union of Concerned Scientists

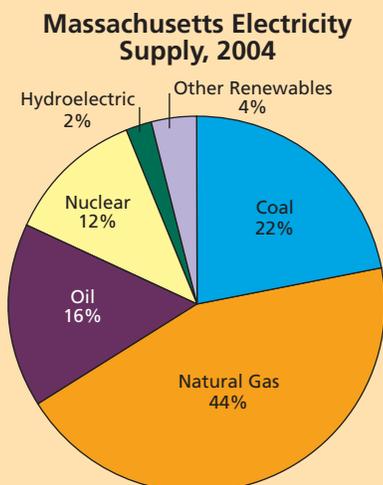
Benefits to Local Communities

WIND POWER CAN offer large economic benefits to host communities, while also helping to improve the environment. New jobs, more money for towns and schools, cleaner air and water, a more reliable electricity supply, and stable energy prices are just some of the many potential benefits. However, new wind power projects sometimes face challenges at the local level because communities are often unaware of the many benefits the project can provide.

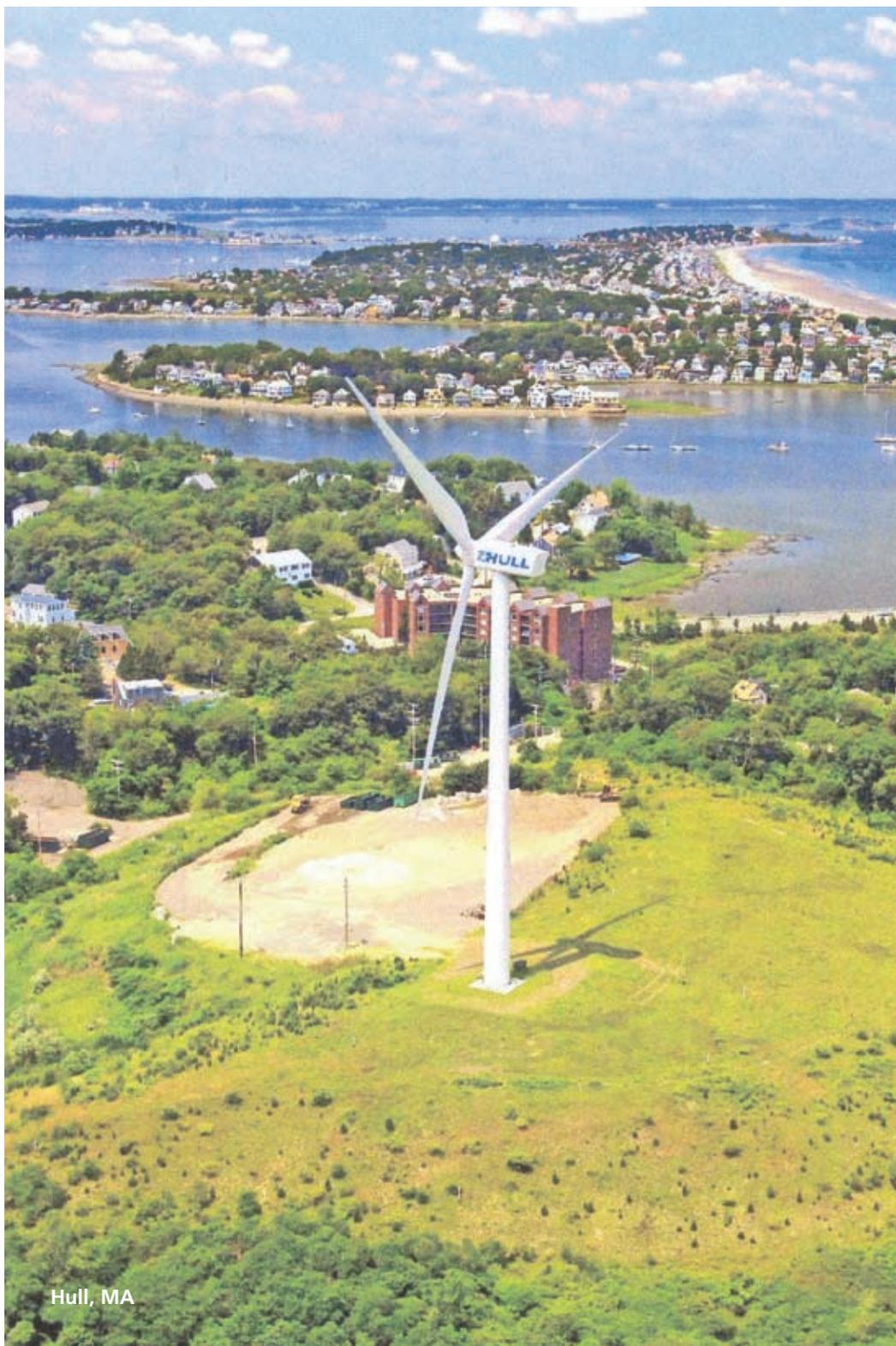
New England has installed only a handful of wind turbines to date. Based on the strong, positive feedback coming from the three New England communities that host wind turbines—Hull and Princeton, MA, and Searsburg, VT—it is time to examine the benefits more closely.

More Secure and Reliable Energy

More than 60 percent of New England's electricity is generated using fossil

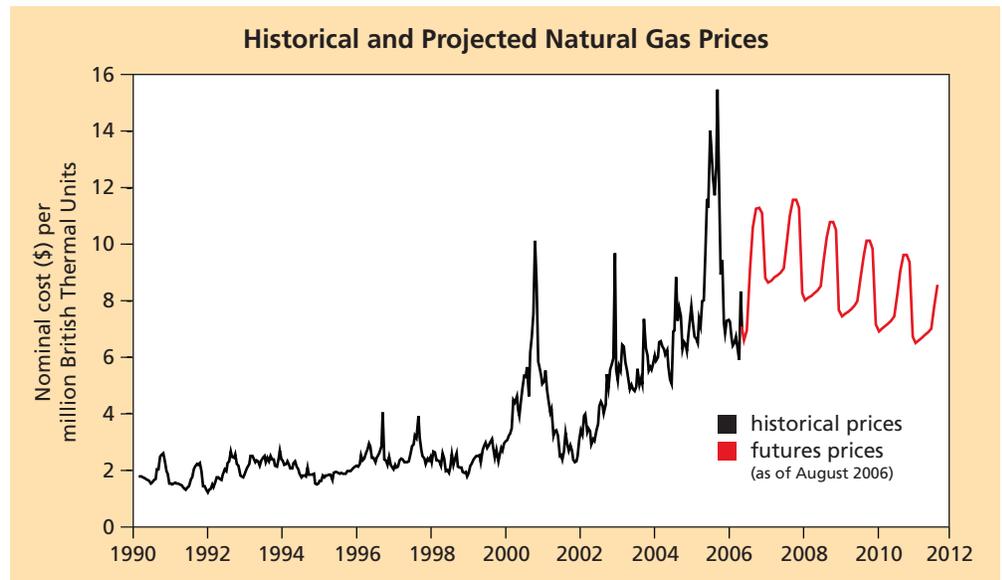


Data Source:
Energy Information Administration, 2005



fuels—natural gas, coal, and oil—with another 25 percent generated from nuclear fuel. In Massachusetts alone, these fuels comprise nearly 95 percent of total electricity generation. However, New England does not have its own supply of coal, oil, natural gas, or nuclear fuel, so most of the region's power plants rely on imported fuel, increasing the risk of fuel shortages or cutoffs. The operators of the electrical grid are particularly concerned about potential natural gas shortages, especially during winter cold spells when gas is also needed for heating. Due to this concern, the region is becoming increasingly dependent

The proposed Hoosac wind project in western Massachusetts is expected to generate \$200,000 in annual revenues for the towns of Florida and Monroe, plus production royalties of \$80,000 to 100,000 per year for leasing land for the turbines.



Note: Historical cost reflects the daily price history of natural gas futures contracts traded on the New York Mercantile Exchange. Futures prices are calculated for the first day of each month. Data source: Lawrence Berkeley National Laboratory

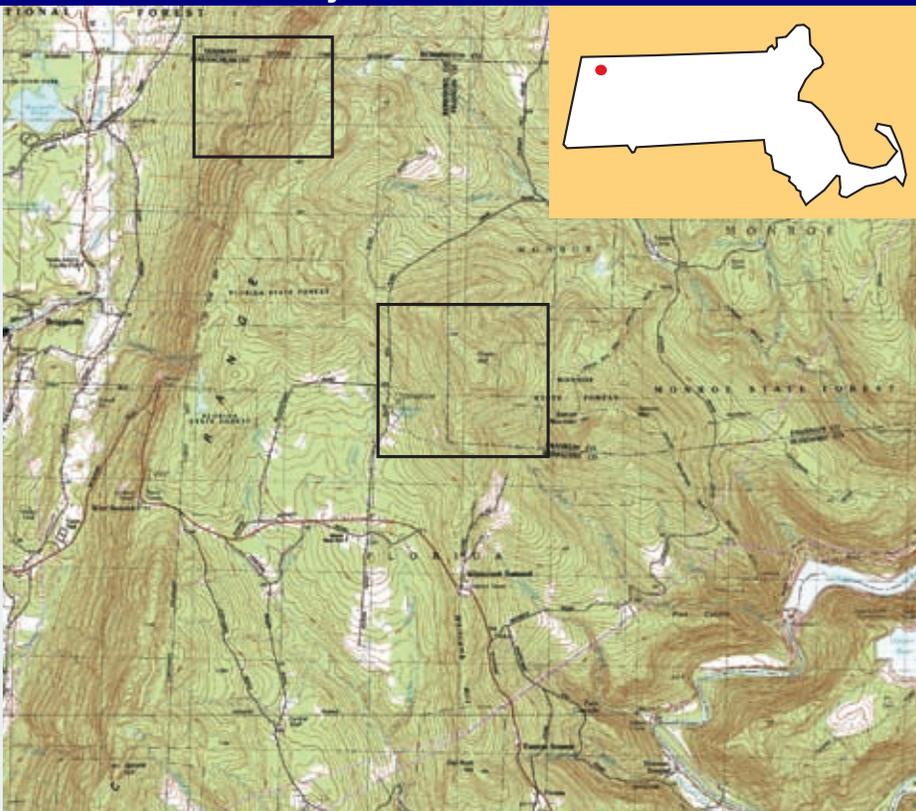
on imports of liquefied natural gas (LNG) from other countries.

Using wind energy generated within the state and region keeps energy dollars in the local economy, instead of sending them out of the state and country. It also reduces the risk of supply cutoffs or shortages, and allows us to become more energy independent.

More Stable Energy Costs

Fuel prices change frequently and are hard to predict. The low cost of natural gas in the 1990s led New England energy companies to build many new natural gas-fired power plants. Since then, however, peak gas prices have surged more than 400 percent, and, as the chart above shows, are expected

Hoosac Wind Project



Location: Florida and Monroe, MA

Project size: 30 MW (20 turbines, each ~1.5MW)

Turbine model: Not yet determined

Owned by: PPM (purchased from enXco)

Development period: 2002–2008

Year online: Planned for 2008

Annual energy produced: 95,000 MWh (projected), enough to power about 16,000 homes

Annual emissions avoided (projected):

SO₂: 188,000 lbs.

NO_x: 70,000 lbs.

CO₂: 112 million lbs., the equivalent of taking more than 7,550 cars off the road

Local benefits: The towns of Florida and Monroe will receive \$200,000 in annual revenues from the project, plus royalties of 2.5–4% on annual gross revenues to property owners for turbines on their land, including town property.

Map Source: Micropath

to remain very high, at least through 2012.

Most of the cost of making electricity from the wind is in purchasing and installing the turbines. After that, the “fuel” is free and operating costs are very low. Communities that own their turbines, such as Hull and Princeton, can reduce and stabilize electricity bills for their residents. Private developers generally offer long-term fixed price energy contracts to communities or customer groups, or utilities. Whether a wind project is municipally or privately owned, the end result is more stable prices to consumers.

A Boost to Local Economies

In addition to stabilizing fuel costs for utilities, residents, and businesses, wind power projects can generate significant economic benefits to local economies. These benefits include:

Revenue. Local governments receive property and income tax revenues, or annual payments in lieu of taxes, from wind project owners. As town services such as water or sewage aren’t needed to operate a wind farm, the payments from wind projects can help towns improve or expand their community services.

Income. Property owners often receive lease payments and/or production royalties for use of a portion of their land, and because wind turbines take up very little space (two percent or less of the land area needed for a wind farm is occupied by wind turbines, access roads, and other equipment), the surrounding land can still be used for other purposes such as agriculture or recreation. Depending on the size of the wind turbine and project terms, annual lease payments to landowners can range from \$2,000 to \$5,000 per megawatt (MW), with additional royalties based on a percentage of the project’s annual revenues.

Hull Wind One

Location: Hull, MA

Project size: 660 kW (1 turbine)

Turbine model: Vestas V47

Owned by: Hull Municipal Light Plant

Development period: 1998-2001

Year online: 2001

Annual energy produced: 1,545 MWh, enough to power about 250 homes

Annual emissions avoided:

SO₂: 3,100 lbs.

NO_x: 800 lbs.

CO₂: 1.7 million lbs., the equivalent of taking 115 cars off the road

Local benefits: Hull Wind One reduces energy purchases, provides stable electric rates, and produces annual savings of \$128,850 (or \$2.5 million over its 20-year operating lifetime). The positive benefits and strong local support have led to installation of a second, larger (1.8 MW) turbine known as Hull Wind Two at a closed landfill site.

Recognition: Hull and its municipal utility have received nine state and federal awards and was featured on Discovery Channel Canada for leadership in energy and the environment.



photo © NREL

Morrison Berkshire, Inc., a heavy steel fabricator in North Adams, MA, manufactured the tower used for the International Brotherhood of Electrical Workers (IBEW) Local 103 turbine in Boston.

Jobs. Wind power generates 40 to 160 construction jobs per 100 MW of generating capacity or about 1 to 2 jobs per 1.5 MW turbine. Site preparation, component manufacturing, and installation of electrical lines are sometimes contracted to local businesses, while construction workers from inside and outside the region spend their earnings

on housing, restaurants, and retail establishments within the community. Once constructed, roughly 10 to 25 permanent jobs are created to operate and maintain every 100 MW of generating capacity.

Property values. A national study of more than 25,000 real estate sales near wind farms across the country found no evidence of a negative impact on property values, and in some cases it even showed a positive effect. In the coastal community of Hull, MA, property sales near Hull Wind One since it began operating in January 2002 show increases in property value consistent with the rest of the town, according to local realtors.

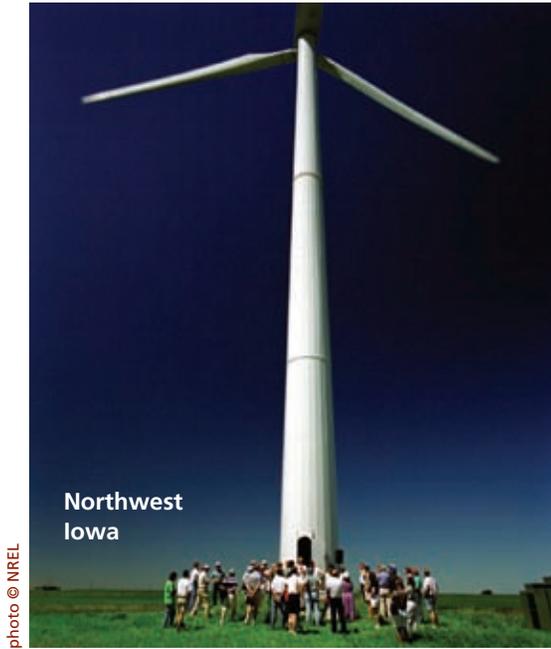


photo © NREL

Northwest
Iowa



photo © NREL

Wind projects generate construction jobs for local workers and attract visitors to local communities.

A long-standing real estate firm serving Hull and the neighboring towns of Cohasset and Hingham highlights Hull Wind One in its sales materials, touting the far-sighted thinking that the use of wind power represents, the stable electricity rates it provides, and the overwhelming town support for a second turbine, which was erected in 2006.

Tourism. The experience of existing wind projects in New England and other locations is that they increase tourism activity. Summer tours of the Searsburg, VT, wind project are regularly filled, and Hull Wind One similarly attracts many visitors year-round. As with tourists to other attractions, turbine visitors are likely to generate additional revenue for the community by patronizing local shops and restaurants during their trip.

Cleaner Air and Water

Power plants are a leading source of environmental pollutants, including sulfur dioxide (SO₂), which causes acid rain; nitrogen oxides (NO_x), which contribute to smog and acid rain; carbon dioxide (CO₂), the main heat-trapping gas that causes global warming; and mercury and other toxic chemicals that contaminate lakes and streams. These pollutants are also a public health concern; soot and smog can cause or aggravate asthma and other respiratory problems, and mercury is a potent neurotoxin that can cause birth defects. In addition, mining and transporting fossil fuels, and disposing of mining and power plant wastes, causes pollution and destroys animal and plant habitat.

Wind turbines, on the other hand, produce electricity with no air or water pollution and generate no harmful wastes.

And when wind energy is added to the electrical grid, less electricity is needed from other power plants, so they burn less fuel.

Public Support

In the two Massachusetts towns with wind turbines, Hull and Princeton residents voted by a 2–1 and 3–1 margin, respectively, to build more turbines in their towns. In Searsburg, VT, home to one of New England's largest wind projects, support for the project increased from 65 percent before it was built to 83 percent afterward. More recent polls indicate that 81 percent of Vermonters would find wind turbines on the mountain ridges acceptable or even beautiful. These favorable opinions clearly reflect the positive contributions and benefits of wind projects, which have become a source of local pride.

Wind Power in New England is a series of fact sheets that describes the economic and environmental benefits wind power can bring to New England residents and businesses, and the important role it can play in reducing the impact of global warming on our ecosystems and communities. These fact sheets were created by the Union of Concerned Scientists (UCS) with funding from the Massachusetts Technology Collaborative (MTC). Fully referenced versions of these fact sheets are available on the UCS website at www.ucsus.org and the MTC website at www.masstech.org



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