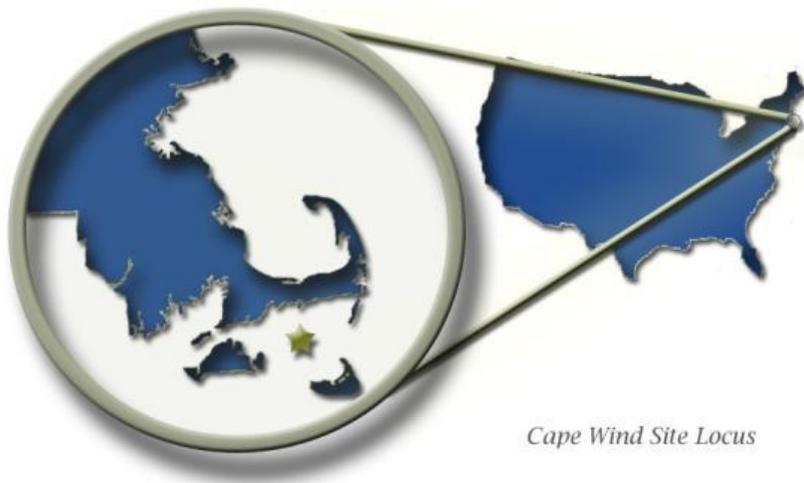


## Cape Wind & Massachusetts

### *Creating Jobs and Providing Clean Power to Massachusetts*

May 1, 2012



The Massachusetts Department of Public Utilities (DPU) reviewed and approved the long term Power Purchase Agreement (PPA, also referred to as ‘the contract’) between Cape Wind and National Grid after a five month adjudicatory proceeding involving twenty two different parties. Supporters and opponents of the contract made their case and called witnesses. In the end, the DPU concluded that:

*“The evidence in this proceeding makes it clear that the Cape Wind project offers unique benefits relative to the other renewable resources available. In particular, the project’s combination of size, location, capacity factor, advanced stage of permitting, and advanced stage of development is unmatched by any other renewable resource in the region for the foreseeable future. This combination of benefits will significantly enhance the ability of National Grid to achieve renewables and greenhouse gas emissions reduction requirements.”*

Last December the Massachusetts Supreme Judicial Court unanimously upheld the DPU’s Contract Approval.

**NSTAR’s filing with the DPU of a long term power purchase agreement for 27 ½% of Cape Wind’s power output will greatly assist the ability of the project to secure financing and make real the many public benefits this project will provide.**

## Jobs & Economic Development

The DPU noted in their contract approval that *“It is undisputed that the construction and operation of the Cape Wind facility will lead to increased jobs in the region.”* In fact, Cape Wind will create up to 1,000 jobs in the region during construction and will permanently employ approximately 50 people at its Cape Cod based headquarters to operate and maintain the wind farm.

There will be additional economic spinoff jobs created in the Massachusetts economy tied to Cape Wind. Hy-Line Cruises announced with Cape Wind last March that they will commission a vessel to provide eco-tours of Cape Wind and they will build a Cape Wind visitors center on their property on Hyannis harbor. Hy-Line Cruises will work with the Cape Cod Community College on credit and non credit courses to train students to qualify for these jobs.

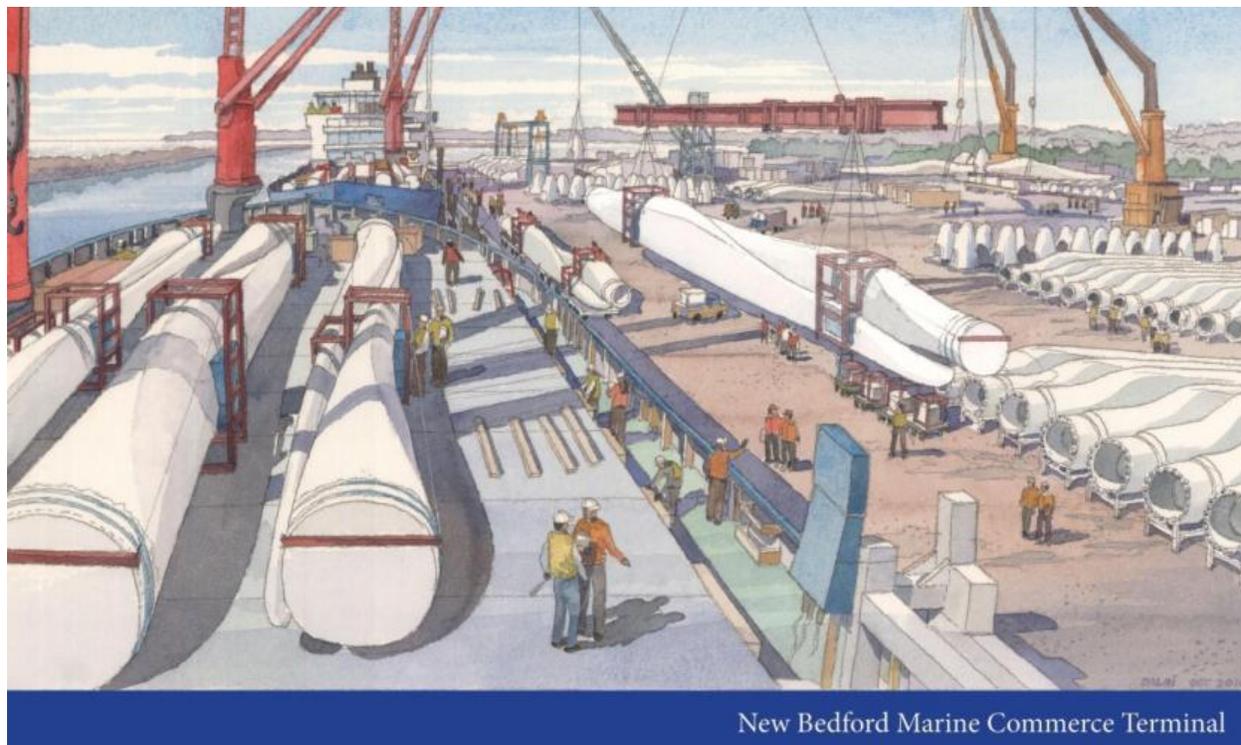


*Artist's representation of the Hy-Line Cruises Eco-Tour of Cape Wind*

Cape Wind donated \$100,000 to Cape Cod Community College to help them become the first community college in the nation to offer a curriculum on renewable energy and Cape Wind is also working with Massachusetts Maritime Academy to ensure there is a local workforce that can meet the needs of Cape Wind and beyond as the offshore clean energy sector grows. In a February, 2011 Op Ed that appeared in the Cape Cod Times co-authored by the Presidents of Massachusetts Maritime Academy and Cape Cod Community College, Admiral Rick Gurnon and President Kathy Schatzberg wrote about their workforce development initiatives to ready their students for offshore wind jobs: *“We*

*should embrace and celebrate these high-paying jobs destined for skilled trade workers, technicians, scientists and engineers. They will encourage more young people to stay on the Cape, raise their families here, and help build our future with a more demographically balanced population. These jobs will breathe vitality into our economy."*

Employment opportunities in offshore wind are also spreading to the Massachusetts south coast. A new Marine Commerce Terminal is being planned in the Port of New Bedford capable of handling the assembly and staging of multiple offshore wind farms as the regional industry develops.



The U.S. Department of Energy has identified the potential of building out wind power off the U.S. east coast and in the Great Lakes over the next 20 years at a scale that would create over 40,000 American jobs. The opportunity for Massachusetts being home to the nation's first major offshore wind farm is to seize the 'first mover advantage' in creating jobs that will be needed for the supply chain to support this emerging industry. Examples of offshore wind companies already creating these jobs in Massachusetts, drawn here because of Cape Wind, include Siemens Wind Power, Global Marine Energy, K2 Management, and SgurrEnergy.

### **A Cleaner & Healthier Environment**

A wind farm like Cape Wind is clean because it produces needed electricity without producing any air pollution like mercury, sulfur dioxide, nitrogen oxide, particulates or carbon dioxide. A wind farm also

doesn't generate waste or use water for cooling (traditional power plants often use tremendous amounts of water).

Not only won't Cape Wind emit pollution, it will actually reduce the amount of pollution being generated by power plants in New England. Cape Wind's turbines will be producing power about 86% of the time and during that time the operators of the electric grid in New England will reduce the amount of power being generated from fossil fueled power plants.

According to the comprehensive review of this project by 17 Federal and State agencies, Cape Wind will reduce the amount of sulfur dioxide and nitrogen oxide by over 1,000 tons per year, and Cape Wind will reduce carbon dioxide emissions by over 770,000 tons per year. Carbon dioxide (CO<sub>2</sub>) is a greenhouse gas that contributes to global climate change and according to the Massachusetts Executive Office of Energy & Environment Cape Wind will cause regional CO<sub>2</sub> reductions equal to that of removing 175,000 cars off the road, each year.

The 'external costs' of energy production from fossil fuel power plants in the U.S. are typically not reflected in the market price of that energy and in the case of coal they are substantial. According to researchers at Harvard Medical School, the mid-range estimate of the external costs of coal in damage to human health and the environment is 18 cents per kilowatt hour, which is over-and-above the market price for that energy.

### **Greater Energy Independence for Massachusetts**

Cape Wind will harness the sea breeze offshore Massachusetts to supply electricity for over 200,000 homes in Massachusetts during average winds and up to 500,000 Massachusetts homes when the winds are strong. This will reduce the amount of power that will be needed from imported sources into our region such as coal, oil, and natural gas. Cape Wind will produce as much electricity in a year from the winds on Horseshoe Shoal as would a coal power plant burning a half million tons of coal, an oil power plant burning 113 million gallons of oil, or a natural gas power plant burning 10 billion cubic feet of natural gas.

Cape Wind's electricity will be supplied directly into the grid in eastern Massachusetts where the greatest demand is located and where this infusion of electricity supply is most needed. In its approval of the Cape Wind / National Grid PPA, the DPU made note of the system reliability benefits of Cape Wind's location and ability to deliver power directly to eastern Massachusetts on Cape Cod:

*"A primary advantage of the Cape Wind facility is that it will be located very near a customer load center and thus contribute more to system reliability than a resource that is located farther away... When a generation resource is located near a customer load center it will: (1) reduce transmission line losses, which also serves to improve system voltage, thereby reduce the amount of power needed from elsewhere; and (2) not be subject to any transmission*

*constraints, which better positions the electric system to respond to any contingencies in the availability of power supply, thereby reducing the probability of surges, brown-outs, and black-out. Today, electricity customers on Cape Cod receive most of their power from: (1) the Canal generating station, located in Sandwich, Massachusetts; and (2) two 345 kV transmission lines that cross the Cape Cod Canal from the lower SEMA area. The Cape Wind facility's injection of power into the middle of this load center at the Barnstable switching station will: (1) balance Cape Cod's reliance on these other two sources; and (2) provide an important redundant supply of power (i.e., one that allows for continuous power flow through the system), even under emergency conditions. Accordingly, we find that the Cape Wind facility's location near a customer load center will substantially enhance system reliability."*

The DPU Order approving the Cape Wind contract with National Grid addressed the unique qualities of the project in terms of scale, location and capacity factor in being able to advance the energy goals of the Commonwealth of Massachusetts:

*"One of the many benefits that Cape Wind provides is that it will assist National Grid and Massachusetts in meeting the renewable energy requirements of the Green Communities Act as well as the greenhouse gas emissions reduction requirements of the Global Warming Solutions Act... The combination of the Cape Wind facility's large size and high annual and peak capacity factors relative to other Section 83-eligible resources, such as land-based wind and solar resources, means that its electricity output will significantly exceed the output of these other resources. Accordingly, the Cape Wind facility will provide far greater benefits in terms of: (1) its ability to contribute significantly to addressing the projected RPS gap; (2) its ability to contribute substantially to complying with GWSA emissions reductions requirements; (3) contributing to fuel diversity; (4) creating a higher level of price suppression impact; (5) mitigating fuel price volatility and acting as a hedge against future fuel prices; (6) contributing to system reliability; and (7) moderating system peak load...the value of the Cape Wind facility as compared to alternative Section 83 resources is further enhanced when these benefits are considered in combination with the facility's favorable location on the regional transmission grid and advanced state of development."*

**Cape Wind – a strong performer during ‘peak’ electric demand events contributes to substantial electric reliability benefits for eastern Massachusetts**

The DPU Order approving the Cape Wind contract with National Grid noted that Cape Wind's Scientific Data Tower has recorded strong winds during times of peak electric demand events in New England:

*"Offshore wind facilities in the Northeast are expected to have a higher capacity factor, with greater coincidence to both summer and winter peak loads, than onshore wind or solar facilities. Moreover, Horseshoe Shoal, the area of Nantucket Sound where the project will be located, has*

*one of the strongest and most consistent wind regimes in New England. Actual hourly wind data shows that the project's capacity factor would have averaged an impressive 76 percent during the region's top ten historic peak [electric demand] hours. "*

Due in part to the 'sea-breeze effect', Cape Wind's location six miles offshore is an ideal location to take advantage of strong afternoon winds on hot summer days when air conditioning use pushes electric demand in New England to historic peaks. This is documented in more detail in a report Cape Wind published in 2007 that is available here:

<http://www.capewind.org/downloads/CWReport.pdf>

Cape Wind will also be a strong performer during cold winter conditions when natural gas supplies available for power plants are low and energy market prices are high. This was noted in a Department of Energy (DOE) White Paper that examined a three day period of sub zero weather when ISO New England was contemplating rolling blackout warnings due to insufficient availability of natural gas because so much natural gas was being used by the heating sector.

The DOE white paper noted that Cape Wind's Scientific Data Tower was reporting strong winds that would have allowed the facility to be operating at full output during almost the entire period, and noted that, *"During the January 14-16, 2004 period of natural gas shortage, the Cape Wind project, if it had been fully constructed and was online, would have made a significant contribution to the power supply and reliability of the regional grid."* A link to that report is available at:

[http://www.capewind.org/downloads/DOE\\_Wind\\_Analysis.pdf](http://www.capewind.org/downloads/DOE_Wind_Analysis.pdf)

This winter vulnerability of the region's electric reliability was highlighted more recently in an October 6, 2011 Associated Press article, 'Report: New England power grid facing challenges', in which Gordon Van Welie, ISO New England CEO, acknowledged some *"near misses"* when natural gas availability for power plants during cold winter conditions dropped and he noted that *"The last thing anyone wants is for the lights to go out in a really cold period in New England"*.

### **Cape Wind: Long Term Price Stability & Predictability**

Part of the challenge the DPU had in estimating the impact that Cape Wind would have on electric bills for National Grid customers is the intense price volatility of fossil fuels, which constitute the bulk of electric generation sources and largely set the price of electricity in New England. The DPU Order approving the Cape Wind contract noted that, *"...from January 2000 through November 2007, National Grid's residential basic service [electricity] customers experienced a 68% increase in their total bills, almost entirely due to rising natural gas prices."*

### **Expected Bill Impact from Cape Wind PPA for NSTAR Customers**

In order to estimate the potential bill impacts of the PPA, NSTAR provided a conservative model (reflecting the downturn in the global economy and lower natural gas prices) that shows a modest increase on a typical monthly residential electric bill of \$1.08. Electric bill increases for all types of customers within their Massachusetts service area will be in the 1.3% to 1.7% range.

### **Massachusetts' electricity customers 'willingness to pay' for clean energy**

Two separate and independent public opinion surveys found large majorities of Massachusetts residential electricity consumers willing to pay more (sometimes much more) than the potential bill increase that NSTAR estimated from their PPA with Cape Wind, in order to obtain a greater share of their electricity supply from renewable sources.

1. On September 21, 2010 Suffolk University / 7 News published a public opinion survey of Massachusetts voters on a variety of political and public policy questions. Question #31 read as follows: *"How much more in percentage are you willing to pay for renewable energy on your current electric bill for sources such as wind power, solar power or biofuels?"* The results were as follows:

Not willing to pay any more:	18%
Willing to pay 1% to 10% more:	26%
Willing to pay 10% to 20% more:	13%
Willing to pay 20% to 50% more:	11%
Willing to pay 50% to 100% more:	9%
Willing to pay more than 100% more:	17%
Undecided:	7%

2. In April, 2011, MassINC published a public opinion survey of Massachusetts residents on issues related to climate change. Question 14 asked, *"Massachusetts law requires utilities to produce more energy from renewable sources each year. If providing this renewable power increases your monthly electric bill by \_\_\_ would you favor or oppose such a policy?"*

The results were as follows:

<u>\$ Electric Bill Increase</u>	<u>Favor</u>	<u>Oppose</u>	<u>Don't know / refused</u>
\$1	80%	17%	2%
\$3	69%	28%	3%
\$5	60%	35%	5%

Analysis: The Suffolk / 7 News poll found 76% willing to pay the additional amount estimated by the NSTAR (or more), compared to only 18% not willing to pay more; and the MassINC survey found 80% willing to pay the additional amount, compared with 17% unwilling.

### **Cape Wind compared with...what?**

Those who oppose Cape Wind's contract with NSTAR say that instead of purchasing power from Cape Wind, Massachusetts utilities should purchase lower priced renewable energy. The reality, however, is that Cape Wind's power price is already significantly less than the price of solar power in Massachusetts. And while there are lower-priced inland wind projects in Northern New England, most of those projects

are remotely located and will create no jobs in Massachusetts and, due to transmission constraints, will typically not be able to deliver incremental power to Massachusetts on a reliable basis. Those projects also tend to produce during off-peak hours, when the power is less needed and less valuable.

**Other Benefits of the Cape Wind contract with NSTAR:**

1. Buyer's option to extend contract at 'cost plus'. At the end of the 15 year contract NSTAR and National Grid has an option to extend the Cape Wind contract on a lower rate structure that would reflect the fact that the capital costs of the project have been mostly amortized by that time. As noted by the DPU, this provision *"could provide significant benefits to National Grid customers at a time when fossil fuel prices could be higher and greenhouse gas emission reductions requirements more stringent than during the first 15 years of the contract."*
2. Any extra wind production is sold at half price. The contract acknowledges the possibility that Cape Wind will produce more power than expected and if that is the case any amount of wind production greater than anticipated would be sold at half price. This could be result from a particularly windy year or could result from improvements in wind turbine component technology utilized by the facility over time. Conversely, if Cape Wind produces less power than expected, electricity buyers are not penalized and will only purchase electricity that is actually produced.
3. Power price is reduced if the project receives a Department of Energy Loan Guarantee. Cape Wind is pursuing the possibility of securing a DOE Loan Guarantee and a provision in the contract returns 75% of the financial benefit of this back to electricity customers in the form a lower power price.
4. Cape Wind's potential return on investment is regulated to benefit electric consumers. This contract provision would reduce the power price to electricity consumers if actual project costs are lower than anticipated and Cape Wind's resulting return on investment would be higher than anticipated. As noted by the DPU: *"Finally, the contract's downward price adjustment mechanisms, in particular the provision for reducing the price if the project's internal rate of return is higher than 10.75 percent, assure that the developer will not reap windfall profits. We note that the costs of the facility that will be used to calculate the rate of return are subject to review by an independent verification agent [to be selected by the Massachusetts Attorney General]."*
5. Contract price includes all present and future environmental benefits. The 'all-in' price not only includes energy, capacity factor value, price stability hedge value, and Renewable Energy Credits, but the contract also provides, at no additional price, any future environmental attributes such as 'carbon credits' that Cape Wind could receive from federal legislation seeking to reduce carbon dioxide emissions to mitigate climate change.

### **Cape Wind will reduce wholesale electric market prices through 'Price Suppression'**

Cape Wind will place downward pressure on the electric wholesale market in New England, resulting in savings to electric consumers. Cape Wind commissioned Charles River Associates to analyze this price suppression effect and they found that Cape Wind would reduce electricity prices by over \$7 Billion dollars over the 25-year life of the project through price suppression.

In its Order approving Cape Wind's contract with National Grid, the DPU found that *"Price suppression occurs when an electricity resource bids into the wholesale energy market at low or zero cost (on account of low or zero fuel costs), thereby establish a lower energy price in the wholesale market. All of the parties in this proceeding who have addressed price suppression agree that the Cape Wind facility will reduce wholesale energy prices..."*

Although the DPU assessed the Price Suppression effect for National Grid's Massachusetts electric consumers as part of their bill impact calculation, the DPU noted that electric consumers all over New England would benefit from this effect in lower wholesale electric prices.

It is widely documented that installed offshore wind projects in Europe are causing price suppression in European wholesale electric markets.

### **What Others are Saying**

- Boston Globe Editorial. *"In the longer term, consumers will get a power source with zero fuel costs, a welcome hedge against the unpredictable fluctuations of natural gas prices. And as high as fossil-fuel prices can go, they still don't reflect the health and environmental costs of their production or their emissions...With energy policy in the country as a whole paralyzed by congressional stalemate, Massachusetts at least has a chance to make itself a leader in clean-energy industries."*
- Boston Business Journal Editorial. *"...the extra rate to subsidize Cape Wind is a very good deal for Massachusetts. The project will put the commonwealth in the forefront of American wind technology while up to 1,000 people construct the wind farm. The Cape, in particular, will benefit from the economic activity..."*
- Fall River Herald Editorial. *"Renewable energy is sensible and it can work, which National Grid's agreement to purchase power from Cape Wind shows."*
- Massachusetts Energy Consumers Alliance & People's Power & Light. *"This Cape Wind project represents a good hedge against fossil fuel prices and it will help tame the market clearing price of electricity...The volatile nature of fossil fuel-based electricity is a barrier in and of itself to efficient markets and the formation of sound public policy. Cape Wind will help to reduce volatility."*
- Environmental League of Massachusetts Corporate Council. *"As major Massachusetts companies we are significant employers and substantial consumers of energy. Energy costs are important*

*to us, but so are price stability and the health and well-being of our employees. We support Cape Wind and the further development of renewable energy in New England and the nation. We must be leaders in this critical area and cannot fall behind the rest of the world. Our economy depends on it."*

- Progressive Business Leaders Network. *"The era of putting Renewable Energy at the center of our economy has begun. The power purchase agreement between National Grid and the Cape Wind project means significant benefits for the region in renewable energy production, job creation, stable (and decreasing) pricing and long-term economic development...Cape Wind means Massachusetts is well-positioned to be an important hub for the offshore wind industry. This means jobs, tax revenue and higher quality of living."*
- Conservation Law Foundation. *"The DPU's decision to approve the Cape Wind power purchase agreement brings Massachusetts one step closer to realizing the economic and environmental promise of offshore wind energy. The decision is particularly significant in that it spells out for Massachusetts residents and businesses that power from Cape Wind will be less expensive than opponents have suggested, especially when one takes into account Cape Wind's value in reducing the volatility of the price they pay for electricity."*
- Natural Resources Defense Council. *"For a nickel a day [projected monthly bill impact for their residential electricity customers], Cape Wind is striving to offer cleaner air, new jobs and reduced reliance on oil, coal and gas...the cost of inaction is indeed higher."*