

## GPG Green Energy Update

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### A New Frontier of Clean Energy

Power generation potential from off shore winds has been estimated to be 4,000GW in the US, a staggering number which is more than four times the capacity of the current US electric grid.<sup>1</sup> If the US were to create even 54GW of off shore wind production, it would generate an estimated \$200 billion dollars in economic stimulus<sup>2</sup>. The ripple effect would be felt in numerous industries related to the projects, and beyond. Globally, the US lags behind in off shore wind production. European countries are responsible for nearly 90% of all off shore wind power in the world, with China following far behind.<sup>3</sup> The industry is relatively new; most advancement made has come in the past 15 years.

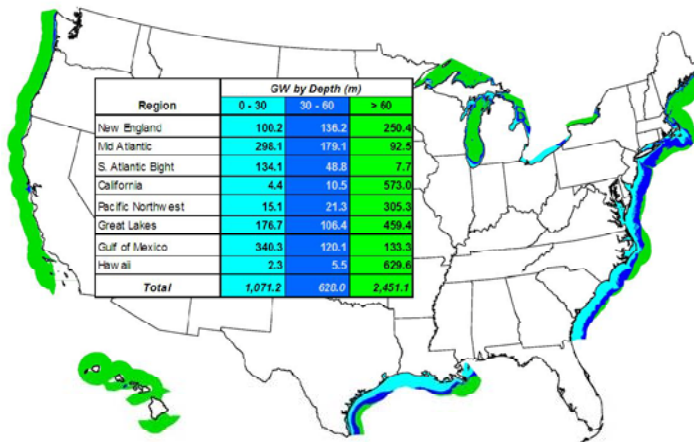


Figure 1 NREL US off Shore Wind Resources

### A Call for Change

As of 2008, the US Energy Department mandated that 20% of the nation's power grid should be supplied by wind energy by 2030. By doing so, the US can reduce its reliance on fossil fuels and the Middle East, while building infrastructure for tomorrow. Currently, the National Renewable Energy Lab (NREL) estimates green energy generation such as wind, solar, and hydro power, only comprises 8% of the US energy grid. Clearly, there is room for growth and a huge industry gap at the moment.

*"Wind power isn't the silver bullet that will solve all our energy challenges, there isn't one. But is a key part of a comprehensive strategy."* -President Barack Obama

### Positive Implications

The obvious benefit of this change is clean, virtually limitless energy generation; however, the US would also benefit from less dependence on fossil fuels and subsequently lower CO<sub>2</sub> emissions. Currently, wind power costs are estimated at 5-8 cents/kW hour, making it one of the most cost effective energy sources in the world.<sup>4</sup> Another compelling reason to support wind power is the incredible economic impact it can have on a region and across the country. Early estimates of the Cape Wind project, underway off the coast of Cape Cod, Massachusetts, call for 600-1,000 new jobs to be created by the project.<sup>5</sup> After construction is completed, another 50-150 full time maintenance and engineering jobs will remain, bolstering the community's economy. This is just one of the dozen outstanding projects currently being bid on, and in line for construction to commence.



<sup>1</sup> <http://www.nrel.gov/docs/fy10osti/49229.pdf>

<sup>2</sup> <http://www.nrel.gov/docs/fy10osti/49229.pdf>

<sup>3</sup> <http://www.nrel.gov/docs/fy10osti/49229.pdf>

<sup>4</sup> [http://www1.eere.energy.gov/windandhydro/pdfs/eere\\_wind\\_water.pdf](http://www1.eere.energy.gov/windandhydro/pdfs/eere_wind_water.pdf)

<sup>5</sup> <http://www.capewind.org/article2.htm>

## Negative Implications

While the sheer abundance of areas available to construct wind farms is great, the readiness and willingness of those living in those areas may not be so. One of the most challenging aspects to construction of an offshore wind farm is getting the state and towns approval. Most farms are constructed 5-14 miles off the coast lines.<sup>6</sup> At these distances, the turbines are not even visible to most. Yet fierce arguments can ensue, as seen in the case of the Cape Wind project, which began permitting in 2003, but did not begin the construction phase until recently. Once approval has been granted, a comprehensive survey of the environmental eco-system must take place; these surveys can often take over a year to complete. If the results find a wind farm would disrupt a vital spawning ground or habitat, the project must be moved or halted indefinitely. A recent NREL report disclosed that once all possible locations have been evaluated regarding eco-systems at sea and on land, only 40% of viable locations would remain for construction. However, even utilizing 40% of viable locations would still result in a +54GW level of production from off shore wind.



## Anyone's Game

The US government estimates that by 2030 nearly 1.4 trillion dollars will be invested in developing US off shore wind capacity.<sup>7</sup> Even with the Cape Wind project finally underway, and several other projects in bidding and leasing phases off the coasts of Texas, New Jersey, Rhode Island, and the Carolinas, the US off shore wind industry is in its infancy and is largely untapped. Newcomers such as NRG, Garden State Off Shore Energy, Coastal Point Energy, and Deep Water Wind, are poised to develop as many farms as they can. In addition, major industry manufacture's such as GE, Siemens, and Mitsubishi heavy industries are segmenting their work force and creating wind farm focus groups to better handle increasing demand. The chart below depicts the projects with immediate economic implications on their region and the industry.

Location	Completion	Cost per Farm
Massachusetts	3-4 year	\$1 billion
New Jersey	5-10 years	\$1.5 billion
Texas	10-15 years	\$2 billion
Carolinas	2-6 years	\$1 billion
Rhode Island	7-9 years	\$4.5 billion

## Fletcher/CSI Insights

Given the relative infancy of the off shore wind farm industry, monitoring and keeping abreast of the changes in the industry will be imperative. Fletcher/CSI can help keep your company current with industry changes and, by doing so, help your company adapt and expand its knowledge base on current acquisitions and technological breakthroughs. Understanding the evolution of this industry into one of the cornerstones of the American energy portfolio will be key knowledge in formulating competitive strategies within the industry in the future. Fletcher/CSI General Practice Group conducts extensive analysis and monitoring of the major players in the US green energy industries and those who support them.

<sup>6</sup> <http://www.nrel.gov/docs/fy10osti/49229.pdf>

<sup>7</sup> [http://www.energy.sc.gov/publications/Wind%20Energy%20Production%20Farms%20Feasibility%20Study%20Committee%20Final%20Report%2012-09%20\(2\).pdf](http://www.energy.sc.gov/publications/Wind%20Energy%20Production%20Farms%20Feasibility%20Study%20Committee%20Final%20Report%2012-09%20(2).pdf)