



## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HELPING TO BUILD A SECURE ENERGY FUTURE

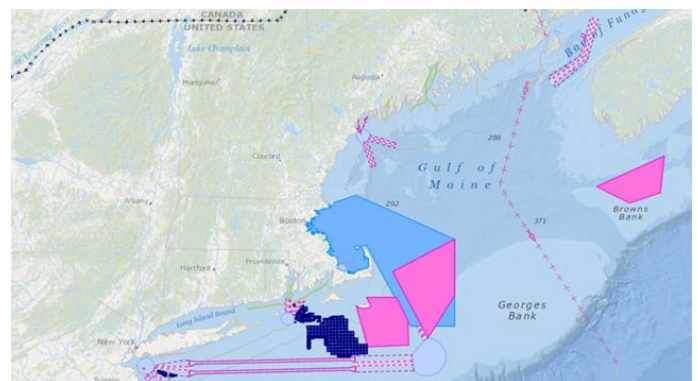
At a time when global energy supplies are uncertain and prices unreliable, increasing domestic energy is an imperative. America needs to control our energy future by harnessing all of the resources that we have available and embracing a diverse energy portfolio. To assist in building a secure domestic energy future, the National Oceanic and Atmospheric Administration (NOAA) is working to **advance responsible domestic energy production, help consumers and businesses save money, and support energy innovations**. NOAA is positioned to provide decision makers with the environmental intelligence, data, and expertise, they need to harness renewable energy from the sun, the wind, the ocean, as well as responsibly develop offshore oil and gas resources. The agency delivers weather forecasts; collects Earth- and space-based observations; works to reduce environmental impacts; and conducts innovative research.

### Advancing Responsible Development of America's Domestic Energy Economy

As stewards of the nation's oceans and coasts, NOAA protects living marine resources and their habitats, and ecosystem health. NOAA provides science, observations and data to inform the responsible development of domestic energy resources. In addition, NOAA works with federal agencies and coastal states to provide emergency responders with tools, such as the Environmental Response Management Application (ERMA), training, and science needed to effectively respond to and restore the environment in the event of

an oil or chemical accident. Lastly, NOAA provides technical expertise and delivers environmental science, products and tools to the energy industry, coastal states, and other agencies to help inform energy siting decisions.

**Did you know?** NOAA is working to better inform energy siting decisions by making ocean and coastal data easier to access through visualization and analysis tools such as the MarineCadastre. This tool allows users to review a variety of relevant NOAA data - from critical habitat designations to right whale calving grounds – allowing project developers to identify areas of potential conflict and areas potentially appropriate for development.



**Figure 1. A MarineCadastre map showing wind planning areas, shipping zones and maritime boundaries off the New England coast.**

## Saving Consumers and Businesses on Energy Costs

Everyday energy decisions are made based on NOAA weather information. NOAA's National Weather Service and National Hurricane Center provide weather data for local and regional forecasts, as well as emergency alerts for severe events such as hurricanes, extreme heat, or solar flares. One major challenge for energy managers is dealing with variable energy production that may be caused by fluctuating weather. For example, clouds block solar panels; hurricanes halt offshore oil and gas production or require wind turbine blades to be repositioned; or solar space storms can cause power grid blackouts. NOAA provides weather information to the public and to decision makers, including the energy industry, so they can plan for variable production or mitigate the impacts from severe weather events. Having information in advance of inclement or severe weather saves energy companies, and ultimately consumers, on energy costs.

**Did you know?** A 2005 study found that U.S. electricity producers save \$166 million annually by using NOAA's 24-hour temperature forecasts to improve the mix of energy sources that are available to meet electricity demands.<sup>1</sup> Accurate temperature forecasts are important because temperature is the key weather variable that determines if someone is going to turn on the air conditioning or heat. [<sup>1</sup> Teisberg, T., Weiher, R., and A. Khotanzad. (2005). The Economic Value of Temperature Forecasts in Electricity Generation. Bulletin of the American Meteorological Society, 86: 1765 - 1771.]



Figure 2. Turbines generate power near Dyess Air Force Base in Texas. Credit: Courtesy of the National Renewable Energy Laboratory.

## Leveraging American Innovation for a More Secure Energy Future

To successfully develop wind and solar energy, a better understanding of these resources is needed, along with more accurate wind and cloud forecasts. NOAA researchers work closely with the U.S. Department of Energy and industry partners to help lower the costs of integrating wind and solar energy into the electrical grid by improving NOAA's short-term weather forecasts. For example, having advanced knowledge of when wind power will "ramp up" or "ramp down" can lead to significant improvements in the efficiency and operation of fossil fuel plants, as well as the entire electrical grid system.

**Did you know?** NOAA teamed up with the U.S. Department of Energy, two private wind energy companies, and academic research institutions on the Weather Forecast Improvement Project (WFIP). WFIP aims to improve NOAA's short-term (0-6 hour) forecasts that impact wind energy generation. The end goal is to lower the cost of electric power for the consumer and meet the President's clean energy goals. NOAA contributed scientific expertise in collecting atmospheric data and in making weather predictions. The project targeted the Upper Midwest and Texas, which were selected in part because WFIP industry partners support thousands of wind turbines in these areas. Preliminary results are excellent, showing a reduction in forecast error and a potential for cost savings.

NOAA's expertise supports a variety of energy sectors, including:

- Offshore oil & gas
- Onshore & offshore wind energy
- Biomass & biofuels
- Nuclear energy
- Ocean thermal energy conversion
- Marine hydrokinetic energy
- Solar energy
- Traditional hydropower

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