

Maine Offshore Wind to Supply Half of Electric Needs

George Harvey

Maine Governor Janet Mills signed into law LD 1895, a bill to advance offshore wind energy in the state, procuring 3,000 megawatts of offshore wind capacity by 2040. This is an important development that could supply a huge amount of electricity. Looking back, it is also a historic development because of the obstacles that had to be overcome to get it passed and signed.

The first of these was clearly known from the very start. Developing offshore wind power in Maine had a severe problem because development sites in the Gulf of Maine all had waters too deep for standard installations with masts standing on the ocean floor. This issue came up in a 2013 post at the *Green Energy Times*' website, which was a repost of an article from the Department of Energy, "Maine Project Launches First Grid-Connected Offshore Wind Turbine in the U.S." (https://bit.ly/Maine_wind_1) The article dealt with a University of Maine demonstration project using a floating wind turbine.

Another problem that had to be overcome was objections by people and businesses engaged in lobster fishing. They wanted their economic interests and the natural resources they depended on to get protection in any legislation promoting offshore wind energy. Their request was addressed in the law.

Yet another problem was that Governor Mills herself would not accept the law as it was originally written. It made



University of Maine's 20-kilowatt grid-tied offshore wind turbine in a 2013 demonstration off Castine, Maine. (Jplourde umaine, CC-BY-SA 4.0, <https://bit.ly/CC-by-SA-4-0>)

possible addressing issues of environment and climate change as she had hoped they would be, but in the form it first reached her desk, it had provisions that would have made it impossible for many Maine workers to get employment on the offshore projects. The result was that the first attempt to pass the bill was vetoed by a woman who was keenly interested in its primary intentions. The work done by the governor was detailed by a press release from her office, "Governor Mills Signs Bill to

Create Jobs, Advance Clean Energy and Fight Climate Change Through Responsible Offshore Wind." Read more at (https://bit.ly/Maine_wind_2)

As it was finally passed and signed, LD 1895 should enable construction of offshore wind farms that could supply half of the electricity needed by the state of Maine in 2040. Given the work that has already been done, we might hope things would get easier. Unfortunately, we cannot assume that much.

There are still obstacles to overcome.

There is still a lot of work setting up the sites that can be auctioned off, getting the U.S. government agencies to agree to the details of the work, and do the auctions required. After that, the auction winners have to install the turbines and get them properly connected to the grid. That has all been anticipated, however.

Unanticipated obstacles have shown up as unexpected costs due to inflation and supply problems. The cost of wind power has been declining rapidly, but at present, the issue is out of hand. According to an article at *OilPrice.com*, the cost of U.S. offshore wind power construction has risen 57% since 2021. Due to cost and supply issues, Iberdrola decided to get out of a contract for an offshore wind farm in Massachusetts, agreeing to pay \$48 million in fines (https://bit.ly/Maine_wind_3).

We should recall that the 2040 goal is still many years off, however, and note that many things will happen in that time. The cost of wind turbine construction has been on a predictable learning curve, going down, and that is likely to continue after unusual conditions pass. One way or the other, we must deal with the situations we find, and hope that progress may continue.

In the meantime, we congratulate the people who have been working so hard in Maine for the work they have done. And we wish them good luck for the future. 🍀

Avast, Mate – Sail Ho!

On August 1, the Pyxis Ocean set sail, under sail, on its maiden voyage from China to Brazil.

Martin Wahl

The 2017 Mitsubishi bulk cargo ship *Pyxis Ocean*, chartered by Cargill, was retrofitted by Norway's Yara Marine with two of UK's BAR Technologies WindWings. This work was done at the COSCO shipyard in China. The wing-like sails are estimated to save up to 30% of fuel usage and greenhouse gas (GHG) emissions, per their press release.

BAR Technologies incorporates aerodynamic expertise from Formula 1 race car designers and provides technology to America's Cup hydrofoil yacht builders.

Each 123-foot-high rigid sail is made from steel and fiberglass consisting of three components: a central 32-foot-wide element and two 16-foot-wide wings on either side, each with a central pivot. This provides a total sail width of 65 feet and area of up to nearly 4,000 square feet.

The wing assemblies rotate to best position them according to the wind angle and speed. They fold down to the ship's deck to allow access at port and for passing under bridges or through canals.

A "line-of-sight" camera replacement system allows an unobstructed view from the ship's bridge as if the sails were not there.

As of this writing, the *Pyxis Ocean* is currently enroute from China to Brazil where it is planned to load a cargo of grain destined for Denmark. To see where it is now – go to *Pyxis Ocean's* location on *MarineTraffic.com*.

Berge Bulk, a leading dry bulk shipping company, also plans to equip its New-castlemax bulk freighter *Berge Olympus*



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with BAR's WindWings by Yara Marine Technologies later this year.

What other wind technologies are in the offing?

Wind-assisted sailing technologies range from Michelin's inflatable sails to rotor-sails that utilize the same spinning effect in airflow to achieve forward thrust that makes fastballs rise and curveballs bend. While rotor sails require engine propulsion to drive them, fuel savings between 6% and 8% have been confirmed.

Some of the other technologies include kites and aerodynamic hull designs that act as sails.

At this time, most are retrofit solutions allowing existing fossil-fuel powered ships to add sail propulsion. There are some initiatives to develop purpose-built sailing ships with supplemental engine power. For example, *Veer Voyage* and *Windcoop* are developing sailing ships that accommodate container shipping.

According to Gavin Allwright, Secretary General of the International Windship Association, more than 30 ships are now equipped with wind-assisted propulsion systems, with a total of 50 to be reached during 2024, and the industry is on a trajectory to double every year.

What if the wind dies down?

The trade winds have remained stable for eons. Additionally, the most common trade routes follow prevailing winds. All of the proposed new designs include auxiliary power, either fossil fuel or electric, for in-harbor maneuvering and when the wind is weak or not favorable. Advanced weather prediction and navigation support systems help determine optimal course planning during a voyage.

The industry is also investigating the feasibility of implementing other fuel sources for powering their fleets, including battery power, biofuels and synthetic fuels. Lloyd's conducted a study surveying shipping companies for their assessment. The conclusion at this time is that a carbon fee is needed to make the conversions cost-effective.

Other issues?

Sail-assisted shipping is a new phenomenon and challenges range from vessel classification and obtaining insurance to crew training and general resistance to change.

In addition to height requirements for bridges and canals, there are other constraints for implementing sail-assist technologies - most concerning ship configuration for cargo storage and loading: the sail structures must not obstruct deck space required for crane access to cargo holds. Bulk carriers like the *Pyxis Ocean* and roll-on/roll-off (RORO) vehicle ferries are good retrofit candidates. Container freighters pose more daunting challenges as crane access

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USDA Rural Development Funds New Hampshire and Vermont Grantees with More than \$1,000,000

Part of Biden-Harris Administration's \$808 Million Investment to Strengthen Infrastructure and Create Jobs Throughout U.S.

On August 28, the U.S. Department of Agriculture (USDA) State Director of Rural Development in Vermont and New Hampshire, Sarah Waring, announced that the Agency is investing \$1,064,000 to municipalities and non-profit organizations in both states through the Community Facilities Direct Loan and Grant Program. The grant funding is part of the Agency's \$808 million national infrastructure and jobs initiative that USDA Secretary Tom Vilsack announced earlier today, focused on helping rural cooperatives and utilities build and improve electric infrastructure, water systems and community facilities in rural areas. The investments will help 480,000 people in 36 states and two U.S. territories stay connected, safe and employed with good-paying jobs.



Northeast Kingdom Waste Management District (NEKWMD) purchased a polystyrene recycling machine with grant funding. The machine condenses the material into ignots which will be sold for use in making foam insulation panels. (NEKWMD)

"USDA invests in rural America because we know strong communities are rooted in their people," Secretary Vilsack said. "Powering people with modern infrastructure creates good-paying jobs and supports opportunities for people to build brighter futures. The investments we're announcing today demonstrate the Biden-Harris Administration's commitment to ensuring that people who live and work in rural areas have every opportunity to succeed – and that they can find those opportunities right at home."

"With this essential funding through Community Facilities grants, rural towns throughout the Twin States will

see quality of life improve in real time," Waring said. "From a state-of-the-art Styrofoam recycling machine in Vermont's Northeast Kingdom, to municipal buildings generating renewable energy in Coos County, New Hampshire, these investments provide a path forward for people looking to make the right economic and environmental choices. And those choices are made possible by the Biden-Harris Administration's insight into the needs of rural communities, and fearless action on their behalf."

The funding advances President Biden's Investing in America agenda, a key pillar of "Bidenomics," to grow the American economy from the middle-out

and bottom up – from rebuilding our nation's infrastructure, to driving over \$500 billion in private sector manufacturing and clean energy investments in the United States, to creating good-paying jobs and building a clean-energy economy that will combat climate change and make our communities more resilient.

The 139 investments announced will help people living in Alabama, Alaska, Arizona, California, Florida, Iowa, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Missouri, Mississippi, Montana, Nebraska, New Hampshire, New Mexico, New York, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Puerto Rico and the Marshall Islands.

For example, in Lyndonville, Vermont, the Northeast Kingdom Waste Management District will purchase a commercial-grade polystyrene recycling machine with help from a \$36,000 Community Facilities grant. In the first year of use, it will recycle roughly four tons of waste material, which will be sold to a commercial buyer to use in foam insulation panels.

In Colebrook, New Hampshire, solar panels on public works buildings will offset 100% of the costs to operate them. This will provide approximately \$81,000 in annual savings over the next 25 years, and generate carbon-free energy on site.

Under the Biden-Harris Administration, Rural Development provides loans and grants to help expand economic opportunities, create jobs and improve the quality of life for millions of Americans in rural areas. This assistance supports infrastructure improvements; business development; housing; community facilities such as schools, public safety and health care; and high-speed internet access in rural, tribal and high-poverty areas. Visit www.rd.usda.gov.

For NH and VT – Rural Development US Dept of Ag, contact Sarah Waring, State Director at (802) 828-6000, or Sarah.Waring@usda.gov.



City Thanks EV-friendly Employers

– Cont'd from p.6

- Adimab recently installed EV charging for employees; and
- Mascoma Bank offers employees an exceptionally low rate on loans to buy EVs; and
- Local car dealers including Lebanon Ford, Volvo and Volkswagen of Lebanon, and Nissan of Lebanon provide EV charging for use by employees and others; and

WHEREAS, these employers serve as role models for forward-thinking employers throughout the Upper Valley,

NOW, THEREFORE, BE IT RESOLVED by the Lebanon City Council that we, the members of the Lebanon City Council, express our gratitude to Dartmouth Health, Hypertherm Associates, Mascoma Bank, Adimab, Lebanon Ford, Volvo and Volkswagen of Lebanon, Nissan of Lebanon, and all other employers in Lebanon who make EV charging available to their employees or otherwise facilitate adoption of EVs by employees. We are grateful for their efforts to meet the needs of employees who drive EVs and to create a sustainable and greener future for our City.

ALSO, BE IT RESOLVED that the members of the Lebanon City Council express our gratitude to employers elsewhere in the Upper Valley who may employ Lebanon residents and who make some EV charging or other EV-friendly policies available to employees, including:

- In Hanover, N.H. – Dartmouth College and Kendal at Hanover;
- In Enfield, N.H. – Montcalm Golf Club;
- In Norwich, VT. – SolaflectEV and King Arthur Baking Company;
- In Hartford and White River Junction, VT. -- The Town of Hartford; Norwich EV;



Clayton Morlock talks with Melissa Ingrisano about his BMW i3 EV at the Upper Valley Electric Vehicle Expo on September 30 in Lebanon, NH. (Meg Newman)

Mascoma Bank; Key Chevrolet of White River; Upper Valley Honda, and All-Star White River at the Gilman Office Center.

LASTLY, BE IT RESOLVED that the members of the Lebanon City Council encourage other employers to take advantage of free assistance for installing workplace EV charging that is available through the federal EMPOWER program (Equitable Mobility Powering Opportunities for Workplace Electrification Readiness) by contacting EMPOWER at www.workplacecharging.com or Jessica.Wilcox@des.nh.gov.

Dated this 20th day of September 2023.
Signed by Lebanon Mayor Timothy J. McNamara on behalf of the Lebanon City Council. ♻️

Avast, Mate – Sail Ho!

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and above-deck storage provide limited deck space for sail-supporting structures.

What's the benefit?

For shipping operators, the biggest benefit is that the wind is free.

The sails cost a reported \$2.55m, according to Yara Marine, and fuel savings should mean payback in as little as seven to 10 years – about a third of the lifespan of the typical cargo ship. Incorporated into newly built vessels with optimized hull and drive train design alongside advanced course planning, they could reduce fuel use by almost one third.

Additionally, consumer demand for low-GHG impact products is growing and some nations are considering imposing carbon emissions fees on shippers.

For the planet, the benefit is a reduction in emissions from an industry that, according to UNCTAD contributes about 2.8% of all GHG emissions and is a focus



The Alfa Laval/Wallenius Oceanbird. (Courtesy image)

for GHG reduction mainly due to its rapid growth, its dependence on carbon-intensive fuels, and the sheer size of its business. More than 80% of the world merchandise trade by volume is transported by sea.

After a career in data product management, Martin Wahl has worked in biofuels since 2006, currently with Lee Enterprises Consulting, a large bio-economy consulting group. Dividing his time between California and New Hampshire, he serves on Corte Madera, California's Climate Action Committee and is a Newfound Lake Region Association member. ♻️