

NEW ENGLAND ISLAND ENERGY PROFILES

Matinicus, ME

A remote microgrid seeking to incorporate renewable generation



Island Snapshot

Critical Needs

With one of the highest electric rates in the country (\$0.68/kWh), Matinicus is pursuing the implementation of a solar/diesel hybrid system to increase reliability and lower costs. Electricity generation and service is plagued with safety, reliability, and efficiency challenges, primarily due to aging generation and distribution infrastructure, and reliance on diesel fuel transported by tanker. These issues have led the island to pursue the "Matinicus Renewable Power Project." The project will replace the current switchgear, add 150-200 kW of solar photovoltaic (PV) generation and battery storage, and replace the power company's aging utility line truck.

Local Governance

Matinicus is a plantation, meaning that it retains some of the attributes of a town but still falls under the jurisdiction of Maine's Land Use Planning Commission (LUPC). Three elected assessors serve the plantation and meet regularly, and also serve as the board of the municipal Matinicus Plantation Electric Company (MPEC). An annual town meeting is held to approve budget items and other issues for MPEC and the community as a whole.

Population	Year-Round 74	Seasonal ~100
Size	720 Acres	
Distance from Mainland	22 Miles	
Median Household Income	\$50,833	
Electrical Systems	Two 65 kW diesel generators; one 100 kW generator	
Electric Rate (2015)	\$0.69/kWh	% Of U.S. Avg. 567%
Minimum Monthly Charge	\$25/month	
Total Annual Electrical Usage	244,500 kWh	
Average Heating Fuel Price (2013)	\$3.50/gallon (#2 heating oil)	

Electrical Systems

With no connection to the mainland, Matinicus generates all of its electricity on-island. MPEC owns and operates three diesel generators which are fueled by diesel stored in tanks by the harbor. MPEC's electricity rate consists of an energy charge of \$0.3045/kWh and a \$25 meter fee which cover all operating costs plus \$1/gallon of fuel. The rest of the fuel is covered in a fuel surcharge which varies from month to month based on the price of diesel. The five-year average (2010-2014) is \$0.68/kWh (including the base rate) but it has been as high as \$0.80/kWh. The island consumes about 244,500 kWh of electricity per year and most of this usage is in the summer.

Heating Fuel Accessibility

The primary heating fuels used on Matinicus include propane, heating oil, and kerosene. Firewood, pellets, and coal are also used. In 2013, heating oil was approximately \$3.50/gallon, propane was \$6.17/gallon, and kerosene cost \$3.97/gallon. Propane supply can be restricted in the winter and weather can limit tanker trips.

Major Energy Consumers

Major energy consumers on the island include the telephone company, as well as some lobstermen's shops. Many of the year-round homes on Matinicus are old and under-insulated.

Energy Leaders

Currently, the power company board is made up of three members, one of whom also serves as head lineman for the power company, and is the advisor for the Diesel Island Fellow shared between Monhegan and Matinicus.



An aerial view of the north end of Matinicus.



The one-room school house on Matinicus.

Energy Initiatives to Date

Energy Efficiency

Weatherization: 18% of year-round homes have received energy assessments and basic air sealing and insulation through the Weatherization Week program. This program has resulted in \$2,690 in annual community savings.

Electrical Efficiency: 900 LED bulbs were purchased for 40 buildings (roughly 35% of the island's building stock) during a series of 2015 group purchases. Estimated annual savings are about \$7,700.

Energy Education & Leadership

Line Loss Study: A study of the financial impact of line losses in the distribution system determined that ratepayers have had to cover the cost of approximately \$260,000 in electricity that was generated but not consumed over the past 10 years.

Energy Inventories: Energy uses (thermal and electrical) have been inventoried in 43 buildings, including 16 year-round buildings and 22 seasonal buildings.

Renewable Energy

Matinicus Renewable Power Project: The project seeks to increase the efficiency and reliability of MPEC's power generation and provide a model for a renewable microgrid system that could be replicated on other islands and in other small, remote communities. The project will replace the outdated, analog switchgear and add battery storage, allowing the generators to run at maximum efficiency and enabling seamless integration of a 150-200 kW solar PV array. Increased system efficiency will reduce the island's costly dependence on diesel fuel.

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