

Renewable Energy Case Study: Deer Island Wastewater Treatment Plant, Mass. Water Resources Authority

Long credited with helping to achieve a dramatic cleanup of Boston Harbor through its deployment of state-of-the-art wastewater treatment technologies at the Deer Island Wastewater Treatment Plant, the Massachusetts Water Resources Authority (MWRA), in recent years, has expanded its environmental stewardship to include clean energy, embracing a plethora of on-site and renewable energy options that serve as a model for similar facilities across the country.

A recipient of the U.S. Environmental Protection Agency's Energy Leadership Award and two LBE Awards, MWRA's Deer Island facility—the country's second largest sewage treatment plant—gets 25 percent of the energy needed to treat its daily average wastewater volume of 350 million gallons from on-site and renewable power generation facilities.

Deer Island is among the largest electricity users in the Northeast, responsible for handling wastewater from 43 Eastern Massachusetts communities and shouldering an annual energy demand of 18 MW and yearly electric bill of about \$16 million. These statistics were powerful incentives for the Authority's investment in a suite of energy alternatives ranging from ground- and rooftop- solar PV systems and wind turbines to anaerobic digesters (AD) and hydro-electric generators that capture water as it drops from the plant into the outfall tunnel shaft. The island's renewable energy generation now offsets 25 percent of its Deer Island energy bill, a \$3.4 million value.

In addition to all the measures implemented at Deer Island, MWRA has installed solar PV, wind, and hydro at several other water and wastewater locations, resulting in significant decreases in grid electricity and an increase in renewable energy generation. MWRA has decreased use of grid electricity by 17 percent between fiscal years 2006–2012 and increased renewable energy generation by 38 percent over the same timeframe. In fiscal year 2012, MWRA generated 27 percent of its total electricity consumption from onsite renewable sources.

Deer Island at a Glance



Wind—Two 600 kW “conventional” turbines, generating approximately 2 million kWh of electricity per year, and one 100 kW FloDesign prototype turbine.

Solar PV—736 kW producing 850,000 kWh of clean electricity generation per year.

Anaerobic Digesters**—Co-generation using methane from on-site digesters saves approximately five million gallons of fuel oil annually; saving some \$2.6 million per year.

Hydro—Two 1 MW hydroelectric generators producing almost 6 million kWh per year.

*** In addition to generating energy, AD produces sludge that is pelletized to become fertilizer, and then given to cities and towns served by the Authority and sold to turf farms.*



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