



MWRA Receives Mass. Energy Award



The Massachusetts Energy Consumers Alliance presented MWRA executive director Fred Laskey with an award for "Outstanding Leadership in the Public Sector" at its annual meeting on October 25, 2010.

Mass Energy noted that MWRA has exemplified how adopting clean energy technologies and practices can achieve economical and environmental results to the public's benefit. It also cited MWRA's renewable energy installations and commitment to energy efficiency.

With wind, solar, hydro and biogas, MWRA currently utilizes nearly 14 megawatts of renewable energy with 3.7 megawatts more under construction and more on the way. At Deer Island alone, MWRA self-generates 23% of the plant's electricity needs - and by using the methane produced in sewage treatment, over 50% of the total energy demand.

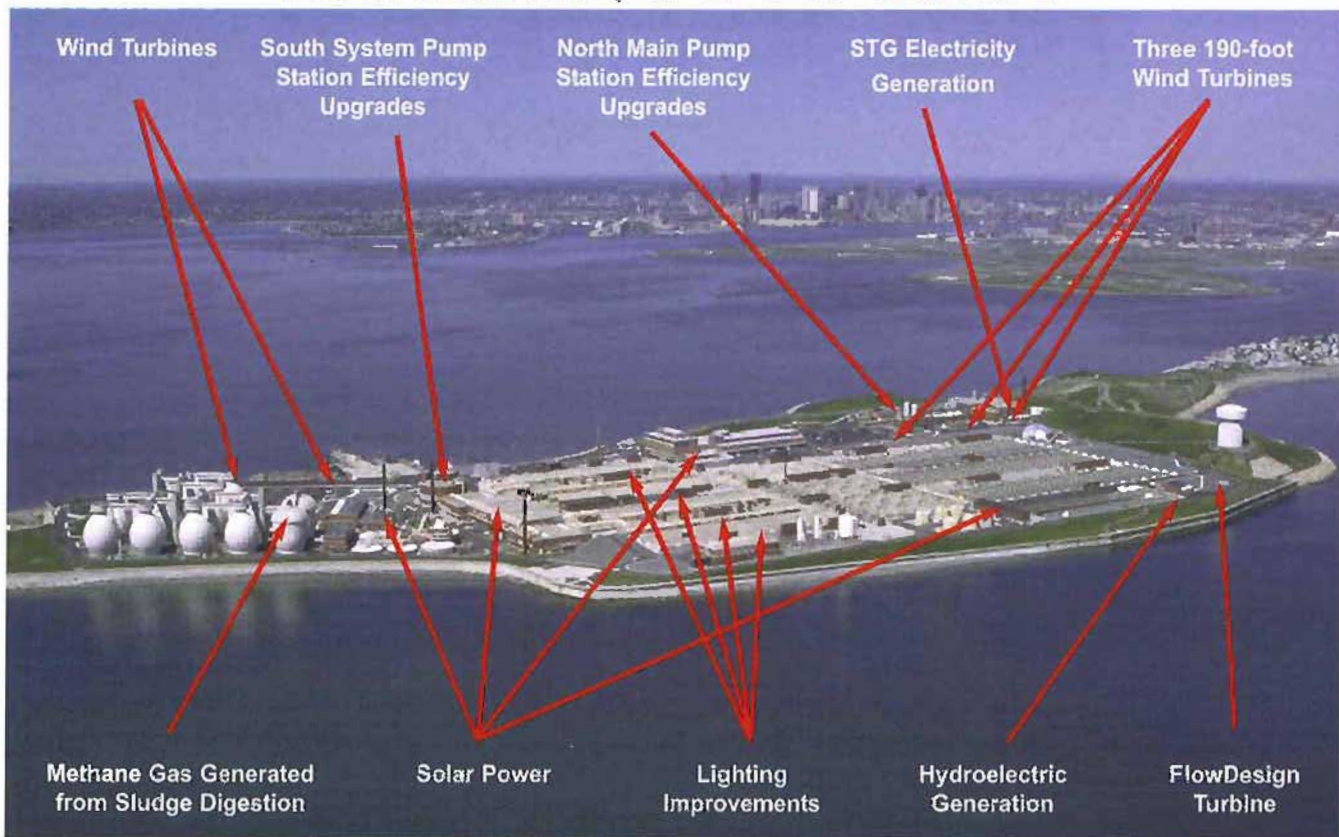
MWRA has also performed energy audits at its major facilities replacing lighting fixtures and HVAC controls for significant savings.

MWRA has also aggressively sought out funding opportunities - receiving more than \$10.5 million in stimulus money and Massachusetts Renewable Energy Trust grants over the last few years.

In addition to this award, MWRA received the "Leading By Example Award" from the Executive Office of Energy and Environmental Affairs in 2007 in recognition of on-site and renewable energy generation on Deer Island, the exploration of other opportunities for solar, wind, and hydroelectric power at a number of facilities, recycling efforts, and its alternative fuel vehicles and diesel retrofits.

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MWRA Renewable Energy Initiatives At Deer Island



The MWRA's Deer Island Wastewater Treatment Plant treats an average of 360 million gallons of wastewater each day from 43 communities in greater Boston and is one of the largest electricity users in the Northeast.

Deer Island currently self-generates 23% of its electricity needs and more than half of the Island's energy demand is provided by on-site, renewable generation.

METHANE/STEAM TURBINE

The methane generated from the sludge digestion process is collected and used in Deer Island's on-site power plant to create steam that supplies hot water and heat for the facility. This results in the avoided cost of \$14 million annually for the purchase of diesel fuel. The steam is also run through a steam turbine generator that produces electricity.

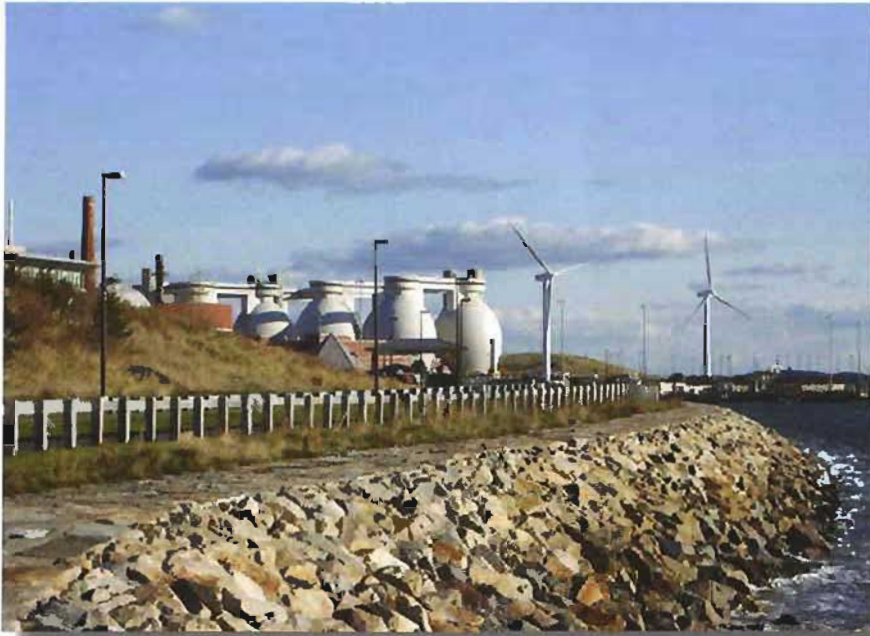
MWRA is currently upgrading the steam co-generation system to optimize use of the digester gas by installing a back pressure turbine. The modifications are expected to increase renewable energy production by 5.5 million kW hours per year (in addition to the current 28 million kilowatt hours per year already produced) and provide a total annual savings in electrical costs of \$2.8 million.

ENERGY EFFICIENCIES

MWRA has embarked on an extensive review of its facilities looking for opportunities to increase energy efficiencies. Lighting improvements have been made at each location, including the installation of motion sensors, and replacement of lamps, ballasts and signage.

New variable frequency drives have been installed at a number of pumping stations – both at Deer Island and within the water system – that run motors more efficiently. HVAC system upgrades and heating set-backs have been performed at several locations and chemical mixers at the Carroll Water Treatment plant were turned off.

WIND



At the Deer Island Treatment Plant in Winthrop, two 190-foot, 600 kW wind turbines went on-line in November 2009. The wind turbines generate over 2 million kilowatt hours per year and provide an annual savings in electrical costs of \$210,000. The \$4 million project was funded in part by a \$400,000 grant from the Massachusetts Technology Collaborative. Plans are underway for three more wind turbines at Deer Island.

FloDesign Wind, a Massachusetts based engineering firm, is installing a demonstrator unit of its innovative new wind turbine, which is modeled after a jet engine. It uses a shroud to concentrate wind and is expected to be 33% more efficient than a traditional blade turbine. This 100-kW turbine will be fully funded by FloDesign and should be completed in early 2011 and should provide an annual savings in electrical costs of \$30,000.



In Charlestown, foundation work has begun for a 365-foot wind, 1.5 MW turbine that will generate 3 million kilowatt hours per year and provide an annual savings in electrical costs of \$300,000. This \$4.7 million project will be fully funded through the American Recovery and Reinvestment Act (ARRA). The turbine will be installed in Spring 2011.

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SOLAR



At Deer Island, a 100-kW roof-mounted solar photovoltaic system was installed on the Residual/Odor Control Building at Deer Island in early 2008. All power generated is being utilized on-site and provides an annual savings in electrical costs of \$11,000. The \$870,000 solar photovoltaic project was funded by a \$310,000 CREB loan and a grant of \$560,000 from the Division of Energy Resources.



A 180-kW roof-mounted solar photovoltaic system was installed on the Administration/Warehouse roof in fall 2009. This \$1.2 million design/build project was partially funded through ARRA and provides an annual savings in electrical costs of \$19,000.

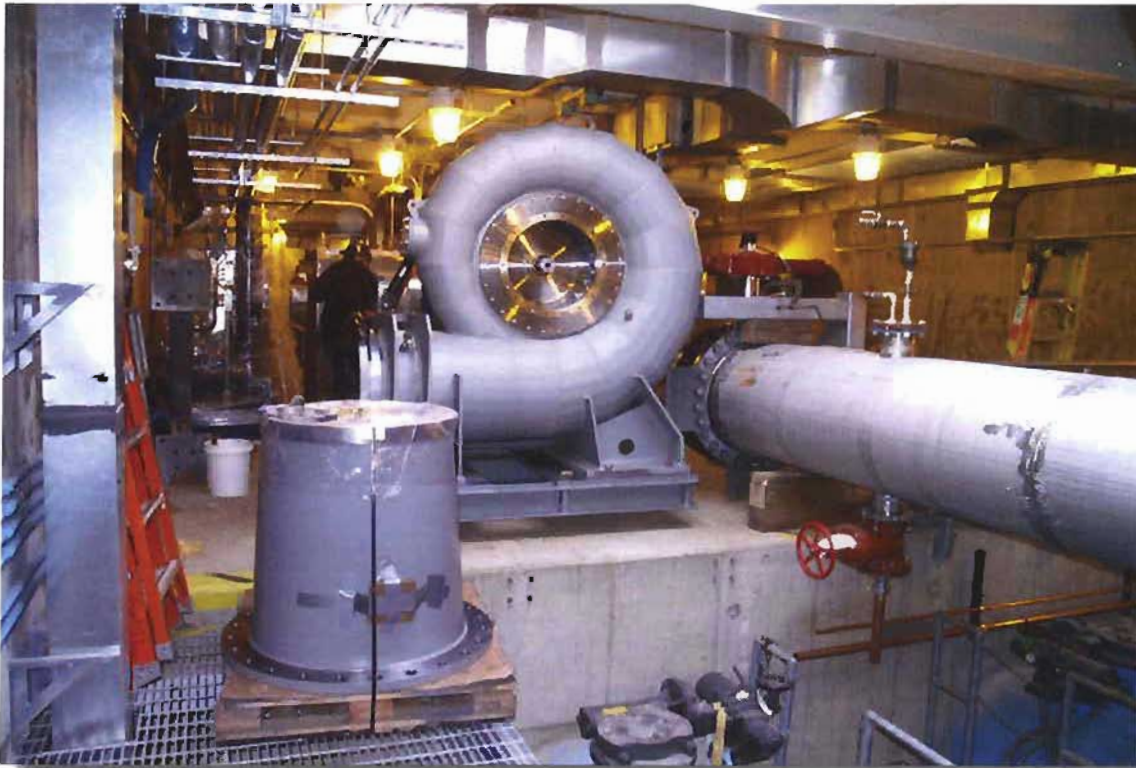


Another 456 kW in solar panels are being installed soon both on the ground under the existing wind turbines and on another roof top. The \$1.1 million project was procured through a Solar Power Purchase Agreement - a financial arrangement in which a third-party developer designs, procures, installs, owns, operates and maintains the system and the host customer provides the site and purchases the electricity. The installation cost is funded through ARRA and should provide an annual savings in electrical costs of \$35,000.

At the Carroll Water Treatment Plant in Marlborough, a 496 kW, ground-mounted solar array has been installed that will generate 616,000 kilowatt hours per year. This \$2.1 million project is fully funded through ARRA and will provide an annual savings in electrical costs of \$87,000.



HYDROELECTRIC



In Weston, a new hydroelectric generator has been installed at the Loring Road covered storage facility, which will generate 1.2 million kilowatt hours per year. This \$1.8 million project is fully funded through ARRA and the Massachusetts Technology Collaborative and will provide an annual savings in electrical costs of \$150,000.



Since 2002, energy is recovered at Deer Island by the flow of treated wastewater as it drops from the plant into the outfall tunnel shaft through two one-megawatt hydroelectric generators that produce over 5 million kW hours per year and provide an annual savings in electrical costs of \$600,000.



MWRA also operates hydroelectric generators where the drinking water enters and leaves the Wachusett Reservoir. At Oakdale, a 3.5 MW turbine generates 13 million kilowatt hours per year and at Cosgrove, two 1.7 MW turbines generate 3 million kilowatt hours per year and provide an annual revenue from electrical sales of \$1.1 million.