



## SHOWCASE PROJECT: COMMONWEALTH OF MASSACHUSETTS: HOGAN/WRENTHAM COMPREHENSIVE ENERGY PROJECT

### SOLUTION OVERVIEW

As part of Governor Patrick's Leading by Example Program and statewide clean energy efforts, the \$24 million comprehensive energy project at the Wrentham Developmental Center and Hogan Regional Center is one of hundreds of projects underway at state facilities designed to reduce state government's environmental impacts. Overseen by the Division of Capital Asset Management and Maintenance, the project at these Department of Developmental Services (DDS) sites reduced energy use by 41% and lower energy bills by more than \$2.5 million annually.

The Massachusetts Department of Developmental Services (DDS) operates the Wrentham Developmental Center and Hogan Regional Center. These institutions serve residents with developmental disabilities and include administrative, residential, recreational, and medical offices.

Hogan is located on the same site as a defunct state hospital, which closed in 1992 after 100 years of operation. Most of the site was sold to a private developer in 2005, but Hogan and an oil-fired power plant were left under state control. The power plant, which had also served the hospital, continued to provide electricity and steam heating to Hogan, even though it was extremely inefficient due its age, lack of upkeep, distance from the load (almost 1 mile), and size. Hogan's energy demands are a small fraction of the former hospital's energy demand, meaning the power plant operated far below its peak capacity. This project included the conversion from dirty #6 heating oil to cleaner burning natural gas and a solar thermal installation.

The Wrentham Developmental Center is a state-operated, intermediate-care residential facility with a capacity to serve 361 adults with intellectual disabilities. The facility opened in 1907, comprised of four residential units and a twelve-bed, state-of-the-art acute care medical center. Prior to the recent comprehensive energy project, Wrentham Developmental Center underwent an upgrade in the early 1980's including renovations to the residences as well as the program building. This project included installation of a natural gas cogeneration system and a ground-mounted solar PV array.

### SECTOR TYPE

State Government

### LOCATION

Danvers, Massachusetts

## PROJECT SIZE

827,000 Square Feet

## FINANCIAL OVERVIEW

Project Cost \$24 Million

## SOLUTIONS

By combining funding from a variety of sources, including ARRA SEP funds for project oversight, state-issued clean energy bonds, utility incentives, and deferred maintenance funds, an array of energy measures were implemented. These included lighting and motor upgrades, building envelope improvements and new building controls, new power plants -- including high efficiency boilers, conversion from oil to gas, and a cogeneration system -- as well as installation of solar thermal and solar PV systems.

Both Hogan/Wrentham sites will undergo a number of energy efficiency upgrades and renewable energy installations including:

- Comprehensive lighting upgrades
- High-efficiency motors
- Programmable thermostats and other energy management control systems
- Insulation
- Upgrades to the power and steam plants
- Replacement of oil-fired equipment with more efficient steam gas or condensing hot water boilers
- Installation of a 522 kW cogeneration system and steam heat distribution system (Wrentham)
- Solar hot water system consisting of 34 solar thermal collectors (Hogan)
- 500 kW of solar photovoltaic system (Wrentham)

Financing for the project included:

- A portion of the \$3.8 million in SEP ARRA funds provided by the Department of Energy Resources to the Division of Capital Asset Management and Maintenance for project design and oversight
- State-issued clean energy bonds to cover a majority of the costs, to be repaid over 20 years out of the resulting energy savings
- An estimated \$1.2 million in utility incentives
- Deferred maintenance funds from the Commonwealth

## OTHER BENEFITS

In addition to the energy and cost savings from the efficiency initiatives, maintenance costs associated with this facility are projected to save the facility an additional \$15 million over the lifetime of the project. This project also reduced environmental liabilities associated with the former power plant.

### Annual Energy Use

(Source EUI)

Baseline(2010)  
443 kBtu/sq. ft.

Actual(2014)  
261 kBtu/sq. ft.

### Energy Savings

41%

### Annual Energy Cost

Baseline(2010)  
\$5,250,000

Actual(2014)  
\$1,993,000

### Cost Savings

\$2,576,000



Wrentham Developmental Center



Old boiler from 1950's



New boilers