SHOWCASE PROJECT: ONE MARITIME PLAZA

SOLUTION OVERVIEW

In January 2012, the Toledo-Lucas Port Authority, a quasi-government entity that provides fixed-rate financing for energy efficiency retrofits, acquired One Maritime Plaza, a seven-story office building in Toledo, Ohio. The building, currently housing 9 tenants and 110 people, had a number of deferred maintenance concerns including heating and cooling inefficiencies. For example, inside temperatures of 80F in summer months hurt office productivity, and the building had disproportionately high energy use and costs.

The Port Authority used its Property-Assessed Clean Energy (PACE) finance program to finance energy efficiency retrofits at its One Maritime Plaza building – this proved to be a good way for the Port Authority to demonstrate its leadership and promote its program by using its own building.

Typically PACE programs enable property owners to finance energy retrofits with an assessment added to the property's tax bill. PACE financing is tied to the property, not the owner. Under Ohio PACE law, municipal, government and non-profit entities are eligible for PACE financing. In the case of the Port Authority, it did not want to add debt to the property which made PACE an attractive option because it can be structured as an off-balance sheet financing.

As of April 2015, the Toledo-Lucas Port Authority has issued more than $17.8 million in taxable revenue development bonds and revolving loan funds to finance PACE projects with an open bond inducement to issue an additional $7.0 million in process.

SECTOR TYPE

Local Government

LOCATION

Toledo, Ohio

PROJECT SIZE

60,000 Square Feet

FINANCIAL OVERVIEW

Project Cost: $1,058,000

SOLUTIONS

A local engineering firm, SSOE, was selected in a competitively bid process as the energy program advisor. SSOE provided a mechanical energy assessment of the Maritime Plaza building and proposed a list of energy conservation measures that would be financed by the PACE program. These measures ranged from window resealing to a comprehensive controls system overhaul.

The Port Authority underscored the importance of having a building controls expert involved from the very beginning. Total financing for retrofits for this property amounted to $1,058,000. The following improvements were carried out:

- **Installed automated building control system that includes real time remote management capability and web-based operator interface.**
  The control system consists of a high-speed, peer-to-peer network of DDC controllers, a control system server, and a web-based operator interface. The control system server is accessed using a Web browser over the Port Authority's local area network, and over the Internet. The system utilizes BACnet protocol for communication to the operator workstation and for communication between control modules.
- **Installed new Variable Frequency Drives for Air Handler supply and return fans.**
  Return and Supply fan Variable Frequency Drives reduced electric consumption and provide regulated building air pressure thereby controlling air infiltration and providing healthy air exchanges.
- **Repaired and controlled Air Handler Dampers**
  Outside air, return air, and exhaust air dampers were repaired and re-controlled. These dampers are critical to the air exchange process for the buildings and provide free cooling during cooler months of the year.
- **Removed and replaced VAV box Controllers throughout the building.**
  The proper operation of the VAV boxes are critical to the health and temperature control of the building and they are one of the most vital components of the HVAC system. Removal and replacement of the pneumatic controls on the VAV boxes allowed all boxes to be networked together and provide critical information on building conditions on a network that is utilized by the air handlers to reset discharge air temperatures, duct static pressures, and control building static pressure.
- **Pneumatic compressed air control system**
  Removed old pneumatic air compressor. Air compressors and pneumatic control systems are extremely costly to operate and inefficient.
- **Perimeter Reheat Coils**
  Controlled the perimeter temperature in the hot water system utilizing the networked VAV box data.
- **Repair entrance air curtain.**
  Prevented unwanted air infiltration at building entrance with air curtain.
- **Remove and replace current electric motors with premium efficiency motors.**
  This simple process yields substantial and immediate payback results and local electric utility has an incentive program in place to promote the replacement of these motors.
- **Repaired water treatment for cooling water systems.**
  Dirty cooling water allows for algae and mud to accumulate inside of chiller barrel tubes and causes the chiller to operate at a high head pressure thereby increasing the current

consumption and adding unneeded wear and tear on to the chillers internal components.
- **Control of cooling water system.**
  Resetting chilled water temperature by utilizing network data from VAV box controllers, forecasted weather, and building environmental conditions.
- **Top to bottom building lighting retrofit.**
- Replace existing inefficient T-12 and incandescent lighting with energy efficiency lighting and occupancy sensors.

- **Retrocommission building mechancial and electrical systems.**
  Complete deferred maintenance and cleaning of mechanical system. Provide verification and balancing of building systems to design specifications to optimize building performance while maximizing occupant comfort and minimizing energy consumption.

Click here to watch a video about Toledo's energy efficiency efforts.

OTHER BENEFITS

This project has resulted in a major upgrade to the existing building, though the look and aesthetic has not changed. Additional benefits identified by the Port Authority included:

- Improvement in overall building performance.
- Significant improvement in tenant comfort and productivity.
- Energy and operational savings provided support for the improvements
- Validates the benefits and success of the PACE program

- Demonstrated program success and expertise is supporting PACE expansion throughout major Ohio metropolitan areas as well as into multiple smaller communities.
- Establishes PACE as a community economic development tool, revitalizing downtowns and businesses, conserving energy and supporting sustainability initiatives.
- Demonstrated leadership and success is increasing awareness resulting in expanding project pipeline.

Annual Energy Use
(Source EUI)

Baseline(2011)
285 kBtu/sq. ft.

Actual(2014)
207 kBtu/sq. ft.

Energy Savings
27%

Annual Energy Cost

Baseline(2011)
$162,000

Actual(2014)
$104,000

Cost Savings
$58,000