

“ By using the performance contract approach with Ameresco, we are able to address several important city priorities of improving our facilities, saving money and being environmentally proactive in reducing the use of energy. ”

Bernie Lynch
Former City Manager, City of Lowell



CASE STUDY

CITY OF LOWELL, MA

Due to on-going budget constraints and increasing operational costs, the City of Lowell was facing needed infrastructure upgrades with limited funding. The City partnered with Ameresco to improve aging infrastructure and capture significant energy and operational savings through energy efficiency and renewable energy projects. Additionally, the City was keen on improving services with a focus towards environmental sustainability, stewardship and carbon footprint reduction.

TECHNOLOGY TYPE

ENERGY EFFICIENCY
ENERGY MANAGEMENT
PHOTOVOLTAIC SYSTEM
RENEWABLE ENERGY

FACILITY SIZE

2.9
MILLION SQ FT
(47 BUILDINGS)

ESPC ENERGY PROJECT SIZE

\$21.1
MILLION

PV CAPACITY

1.8
MW

ESPC ANNUAL
ENERGY SAVINGS:

\$1,522,629



SERVICES PROVIDED



PHASE 1: Energy Savings Performance Contract

Ameresco designed and installed over 23 distinct energy conservation measures including electrical, mechanical, weatherization, water and operational upgrades at 28 schools and 19 municipal facilities. The city-wide infrastructure upgrade and energy efficiency project, is expected to produce annual energy savings of more than \$1.5 million over a 20 year contract. This represents approximately 25 percent savings overall.

The traditional electrical energy conservation measures implemented include lighting system improvements, lighting controls, integrated and new energy management systems, demand control ventilation, vending machine controls, PC load management, variable frequency drives for pumps and fans and energy efficient motors.

Mechanical measures include steam trap replacements, new thermostatic radiator valves, stack-draft reducer, fan coil replacements, energy recovery units, gas furnace repair or replacement and air handling unit replacement. The most significant replacements include both boiler and chiller replacements throughout the City. The existing boilers in City Hall, JFK Civic Center, and Lowell Memorial Library were either defunct or in poor operating shape requiring significant maintenance. At the JFK Civic Center, the existing absorption chillers and cooling tower are defunct and the City used a rental chiller to cool the building during the cooling season. By replacing the aging and

SERVICES PROVIDED (cont.)



defunct equipment, the City realizes significant savings, improved comfort and marketability of the Civic Center.

Weatherization measures include pipe insulation, swimming pool covers, new roofs and windows, attic insulation and other infiltration reductions. Five of the building's roofs had no insulation and frequent leaks, which require significant maintenance. By replacing the aging and failing roofs, the



City benefits from both energy and operational cost savings, as well as increased marketability of the Civic Center.

This comprehensive \$21M Energy Savings Performance Contract (ESPC) is budget neutral and includes over \$1M of utility rebates, as well as leveraging \$250,000 of the City's ARRA - EECBG (American

Recovery and Reinvestment Act - Energy Efficiency and Conservation Block Grant) Program.

PHASE 2 & 3: Solar

Originally evaluated under the ESPC, Ameresco identified significant additional opportunities for photovoltaic power generation. It was determined that a Power Purchase Agreement (PPA) gave the City greater capacity and energy cost stability. Ameresco designed, installed, commissioned, owns, operates, and maintains five roof-top mounted solar PV systems totaling 341.9 kW at three elementary schools, a middle school and the Lowell Memorial Auditorium. The City of Lowell incurs no capital costs and pays Ameresco a 20-year discounted electricity rate compared to anticipated National Grid rates plus the commodity cost of electricity.

The partnership continued, under a separate PPA for a 1.5 MW PV project, this time for a ground mounted system on a capped landfill. More than 6,000 solar panels at the City's capped landfill site, transform an otherwise unusable open space to a modern green-energy site that will generate electricity cost savings for the City.



SERVICES PROVIDED (cont.)

PHASE 4: Energy Management

Energy management comes as the fourth phase in a successful and award-generating partnership between Ameresco and the City of Lowell. Under a new contract, Ameresco will provide a web-based energy management system that collects and analyzes energy usage data for all of the City of Lowell's utility accounts. Ameresco will receive the City's utility bills directly, capture the data, audit the data, and resolve any discrepancies identified in the bills. After that an Accounts Payable file will be sent directly to the City's accounting system for processing and payment. In addition to monthly bill data, Ameresco's energy management system can receive, store and analyze interval data from individual meters and the City's Building Automation Systems, as well as the output from the solar PV projects from which the City purchases some of its electricity needs.

The system will analyze the data to help the City of Lowell better understand and manage its energy consumption and costs. The analysis includes benchmarking, baseline creation, performance reporting, and Measurement and Verification. The system also offers a project tracking module that can track Energy Conservation Measures, track savings, cost-benefit analysis, and log issues and their resolution.

CUSTOMER BENEFITS



Through its partnership with Ameresco, the City of Lowell was able to replace defunct and aging equipment. This robust combination of measures yields in excess of \$1.5M of annual savings to the City. The City schools have improved comfort and educational environment. The City has an improved working environment for its staff and greater marketability for its public gathering venues.

CUSTOMER BENEFITS (cont.)



In 2010, the City of Lowell garnered the Green Community designation from the Massachusetts Department of Energy Resources (DOER). In 2011, the City of Lowell received the Municipal Leading by Example Award presented by the DOER.

The City obtains the environmental and green community benefits of renewable energy and, at the same time, receives electricity cost savings and stable electricity prices for 20 years, rather than volatile commodity, as well as transmission and distribution prices. These green community and financial benefits flow to the City without the City's capital funds or bonds.



ENVIRONMENTAL BENEFITS



Through the City's partnership with Ameresco, Lowell is expected to save the equivalent of 6,158 tons of CO₂ per year. The green benefit from this carbon reduction is roughly equal to:

- **1,270** acres of pine forest absorbing carbon
- **1,023** cars taken off the road for one year
- **775** households powered for one year



SPOTLIGHT

CAPPED-LANDFILL SOLAR FARM

SUMMARY

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PROJECT FACTS

Ameresco Responsibilities: Development, Engineering, Procurement, Construction Management, Operation & Maintenance

- **Total System Size:** 1.5 MW 6000+ panels
- **Expected First Year kWh Output:** 1.88 million kWh
- **Contract Type:** Power Purchase Agreement (PPA)
- **Permits Required:** MA DEP Post-Closure Use Permit, Building, Electrical

ABOUT THE CITY OF LOWELL, MA

The City of Lowell is the fourth largest city in the Commonwealth of Massachusetts. Its strategic location at the intersections of Routes 495, 93 and 3, provides excellent access to all points of interest in Massachusetts as well as New Hampshire and Maine. This planned urban community is built around the Merrimack River and its diverse canal system, which provided power to the early manufacturers. Today these water amenities add to the character of the city.

Learn more at www.lowellma.gov.

ABOUT AMERESCO

Ameresco, Inc. (NYSE:AMRC) is one of the leading energy efficiency and renewable energy services providers. Our energy experts deliver long-term customer value, environmental stewardship, and sustainability through energy efficiency services, alternative energy, supply management, and innovative facility renewal all with practical financial solutions. Ameresco and its predecessors have constructed billions in projects throughout North America and Europe.

For more information about Ameresco and our full-range of energy efficiency and renewable energy solutions, please visit ameresco.com.