

SHOWCASE PROJECT: CITY OF KNOXVILLE: CONVENTION CENTER

SOLUTION OVERVIEW

Led by the Mayor's Energy and Sustainability Task Force, the City of Knoxville undertook a comprehensive energy efficiency upgrade program targeting 99 City buildings, including the Knoxville Convention Center. Retrofits at the Knoxville Convention Center were completed in 2012 with actual savings of \$314,000 per year. The solar array installed on the Convention Center roof is expected to produce 118,240 kWh/yr, which at the incentivized buy back rate will generate approximately \$25,000 annually for the City of Knoxville.

As part of the City's Energy and Sustainability Work Plan, Knoxville is committed to implementing energy efficiency and renewable energy retrofits across its aging public infrastructure. In 2010, the City executed a contract with Ameresco to inventory public facilities and implement retrofits to improve efficiency and reduce energy costs. The project was bid and awarded in 2009, and the \$19,000,000 13-year contract was executed in 2010. Construction at the Convention Center was completed in 2012, and the facility is now LEED certified.

The Convention Center retrofits cost \$3.46 million and have resulted in annual energy savings of 17% with a payback period of approximately seven to ten years.

SECTOR TYPE

Local Government

LOCATION

Knoxville, Tennessee

PROJECT SIZE

500,000 Square Feet

FINANCIAL OVERVIEW

Project Cost \$3.46 Million

SOLUTIONS

The energy efficiency retrofits took roughly a year to complete once contracts were executed due to the need to work around the Convention Center's event schedule. In addition to ESCO-prescribed energy and water conservation measures, the Convention Center was chosen to pilot a DOE-seed funded third party solar finance model, and the roof space was leased to FLS Energy, a private company, to host a 90 kW solar photovoltaic (PV) system. The electricity generated from these installations is added back to the grid and provides energy credits, a savings for both the

Convention Center and the City of Knoxville.

The executed energy savings performance contract with Ameresco enabled the City to finance a range of energy efficiency measures that have reduced annual energy consumption by 17%. These measures included:

- New lighting systems and controls (70.2% energy savings)
- A boiler replacement (20.6% energy savings)
- A new high efficiency HVAC system (9.2% energy savings)
- An updated energy management system

One innovative measure was the complete redesign of the domestic hot water supply to allow the "high pressure" boiler to be turned off when not needed. The lighting controls system enables technicians to set lighting levels at 50% during event move-in and move out, and 100% only during event hours in occupied spaces. To complete the cycle, Knoxville is working with Ameresco to "continuously commission" the building and aggressively monitor the new systems to ensure that efficiency is sustained. The energy efficiency retrofits took roughly a year to complete once contracts were executed due to the need to work around the Convention Center's event schedule.

OTHER BENEFITS

The Knoxville Convention Center was the first building in Knoxville to undergo a complete energy efficiency upgrade with building integrated solar PV. Projects like these move the City towards reduced and cleaner energy use, and set the blueprint for future energy efficiency improvements. The third party solar financing approach can be applied across TVA's seven-state service area and may be applicable as a model for local governments to procure affordable clean energy in other settings where a utility has a similar power purchase agreement program.

LEED certification for the Convention Center was obtained in late 2012 and the project provides the following benefits for the City of Knoxville and other local governments in the region:

- **Replicable Financing Model** - The third party solar financing approach can be applied across TVA's seven-state service area and may be applicable as a model for local governments to procure affordable clean energy in other settings where a utility has a similar power purchase agreement program.
- **Job Creation** - The contracts with Ameresco and FLS Energy increased opportunities for local contractors and helped support jobs in the energy sector, which is a rapidly growing field in the State of Tennessee.
- **Demonstration Project** - Moving forward, the Convention Center will be used as a lead by example demonstration project for the larger Knoxville community and a place where other businesses can learn about energy efficiency and renewable energy opportunities.

Annual Energy Use

(Source EUI)

Baseline(2010)



Actual(2013)



Energy Savings

17%

Annual Energy Cost

Baseline(2010)



Actual(2013)



Cost Savings

\$314,000



The Knoxville Convention Center



90 kW rooftop solar PV system



Inverters control the 90 kW photovoltaic system