



# Facility Energy Efficiency Project

US Department of Energy

Energy Infrastructure Deployment on Tribal Lands

# Oneida Indian Nation

## FACILITY ENERGY EFFICIENCY PROJECT

### MULTIPLE ENERGY EFFICIENCY MEASURES



#### Project Summary

Oneida Indian Nation's *Facility Energy Efficiency* project aims to reduce the Nation's energy usage by installing energy efficiency upgrades throughout **27 Nation-owned buildings** (office space, warehouses, police facilities, convenience stores, and entertainment venues), covering over **3.8 million square feet** of facility space:

- Interior and exterior lighting upgrades with LED technology
- Remote HVAC management
- Improvements to hot water heaters and refrigeration

This project furthers the Nation's goal to preserve and protect its natural resources to ensure a safe, healthful, and productive environment for current residents and visitors on its lands, as well as for the seventh generation to come.

#### Key Personnel

**Key Oneida Indian Nation personnel include:**

- Ray Halbritter, Nation Representative & Chief Executive Officer
- Peter D. Carmen, Chief Operating Officer, Business Contact
- Bryan Mignone, Deputy General Counsel, Technical Contact
- Brian Snyder, Turning Stone Resort Casino Facilities Director
- Paul Gwilt, Nation Facilities Director

#### Budget

**Federal funds requested: \$1,523,946**

**Cost-share: \$512,768**

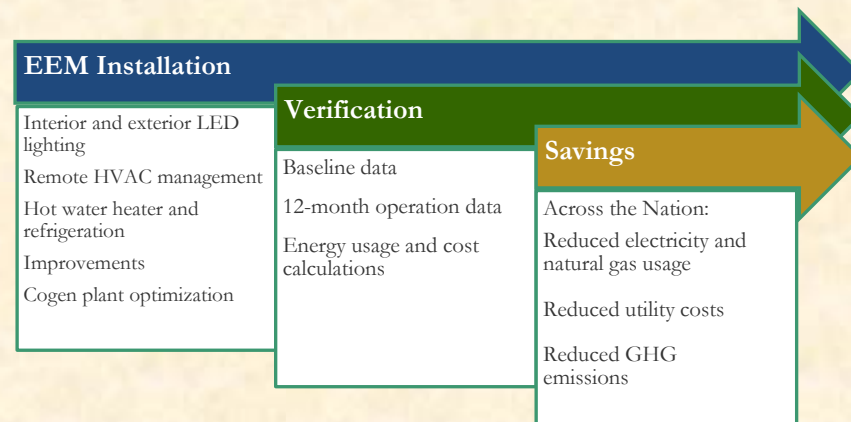
**Total Project Costs: \$2,036,714**

#### Project Outcomes

- (1) over **\$450,000** saved annually
- (2) decrease of more than **4 million kWh** and **50,000 therms** of energy usage annually
- (3) reduction of more than **3,000 metric tons of greenhouse gas emissions** annually

The payback period for this project is **4 years**.

Realization of these impacts will help the Oneida Indian Nation achieve its goal of effective *environmental stewardship*.



*Oneida Indian Nation's building energy efficiency upgrades will generate substantial environmental benefits.*



# Project Goal

The Oneida Indian Nation recognizes the need to be a responsible steward of its resources—including energy resources—while encouraging economic development to support the needs of its operations, programs, and members. The *goal* of the Oneida Indian Nation *Facility Energy Efficiency Project* is to build upon a previously conducted energy audit of Nation buildings to implement energy efficiency measures across 27 facilities.

As part of a US Department of Energy *First Steps toward Developing Renewable Energy and Energy Efficiency on Tribal Lands* grant awarded in 2017, the Nation contracted with an energy consultant to provide a comprehensive analysis of energy consumption for approximately 40 buildings (~3.8 million square feet of building space).

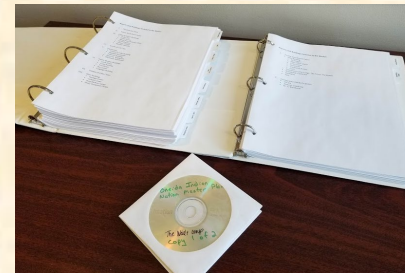
The resulting audit, consistent with ASHRAE Level II requirements, provided dozens of recommended efficiency measures for the facilities studied.





# Energy Master Planning deliverables

- The 2018 energy audit report explored feasible technology alternatives. Using industry expertise, the consultant recommended specific technologies (*e.g.*, LED lighting, electronically commutated motors for coolers) for each building and measure. Each recommended measure was described in detail, evaluating compatibility with existing infrastructure, operation, and costs with assumptions clearly stated.
- Multiple measures, by building, were presented with associated implementation costs and resulting energy/cost savings. A Savings-to-Investment Ratio (SIR) was calculated for each measure across all properties as well as for each property individually. The higher the SIR, the more cost efficient the change.
- The Nation evaluated the economic impact of various solutions, focusing on the return on investment. Based on the analysis, Nation leadership agreed that the best options to pursue were EEMs with reasonable return on investments. The selected EEMs (LED upgrades, HVAC improvements) all involve equipment that is commercially available and warranted.





## The Project

The Oneida Indian Nation (the Nation) has entered the fourth of this four-year project to implement numerous energy efficiency measures (EEMs) across multiple facilities. Much of the work has been completed and a diverse array of energy-saving components has been installed over the course of this past project year. Installed EEMs include interior and exterior LED lighting retrofitting; thermostats to facilitate remote control of heating, ventilation, and air conditioning from the Facilities office; kitchen hood controls; and, refrigeration condensing unit upgrades.

The project encompasses 27 buildings located on Nation lands including offices, cultural centers, police facilities, convenience stores, and the Turning Stone Resort Casino (TSRC).

The combined impact of the savings in energy and costs will continue well into the future as the selected improvements utilize equipment with longer useful lives than the older and often obsolete versions. Even those measures with longer rates of return on investment contribute to the sustainability of the Nation facilities.

# Energy Efficiency Measures



## Interior / Exterior LED Lighting (25 buildings)

In general, replacing the existing incandescent, fluorescent, and high intensity discharge fixtures with new LED fixtures produces an attractive payback.

Exterior lighting (primarily parking lots, including those at TSRC) are being updated to LED fixtures. This involves removal of existing fixtures and installation of new fixtures as well as replacement of light poles to accommodate the new fixtures and an upgraded electrical network connecting the new poles.



Interior lighting being converted to LED consists of removal of existing fixtures and installation of new fixtures and occupancy sensors.

## Remote HVAC Management (19 buildings)

This includes installing programmable thermostats and a remote access connection and the implementation of demand control ventilation system with CO<sub>2</sub> sensors and Remote Terminal Unit Distributed Control System (RTU DCS) controllers.



## Other EEMs include

- Hot water heater upgrades (3 buildings)
- Refrigeration condensing unit upgrades (3 buildings)
- Walk-in evaporator fan electronically commutated controls (5 buildings)
- Snow melt boiler replacement (1 building)
- HVAC replacement (1 building)





## Turning Stone is the area's largest consumer of energy

The Turning Stone Resort Casino is comprised of 3.4 million square feet of facility space across multiple buildings on an 812-acre campus. Turning Stone is the largest Nation facility and includes gaming space, lodging facilities, spas, entertainment complexes, dining and banquet facilities, and administrative offices.

*In a given year, the amount of electricity and natural gas purchased and used by Turning Stone could light over 104,100 homes and heat over 7,600 homes in New York State.*

The EEMs for Turning Stone include exterior LED lighting replacement; a chiller system upgrade at the Cogen plant which includes the installation of water pump controls to balance water temperature and volume for maximum efficiency; and, installation of energy efficient kitchen exhaust hoods with sensors that allow operation to be adjusted based on cooking intensity.

**Turning Stone EEMs represent 44% of the projected savings over 4 years.**



# Getting to Implementation



The Nation completed initial project steps:

- Created a complete list of all equipment and supplies with model numbers and brands, where applicable, and identification information for each item.
- Developed detailed scopes of work that could be provided to potential vendors.
- Prepared requests for proposals (RFPs) for each element of every project component. Some components require materials, installation, mechanical work, and electrical work – four RFPs for one project component.
- Found vendors that were available to bid on project components.
- Scheduled and conducted walk-throughs to familiarize vendors on the details of the project components and to answer vendor questions.
- Accepted and reviewed bids and selected the most appropriate vendors; sent bids to DOE for approval.
- Negotiated contracts with the selected vendors.







# Implementation

- Due to the time of year and the need to have the new equipment available, the snow melt boiler was purchased and installed within weeks of the project start in the fall of 2019.
- A sample remote thermostat was chosen and installed. It works flawlessly, but the Nation is reconciling some security issues with the cloud-based software.
- The Nation's Supply Chain staff completed the vendor selection process for all of the contracts.
- The last phase before verification of savings can begin is delivery and installation of the materials. Production and delivery delays put this project behind schedule, and a few final deliveries are still pending.
- Some parts (variable speed drives) require specialized construction to ensure compatibility with existing motors which requires months for completion.
- The extremely large quantity of light fixtures involved in the Nation facilities component – 7 tractor trailer loads! - requires that delivery be broken into phases because the Nation does not have warehouse space available to hold them all.



# Challenges

- **COVID-19 long-lasting impacts.**
  - Production of parts was delayed, and there were repeated changes to delivery dates.
  - Delivery transportation is delayed everywhere for all materials.
  - Vendors are working with fewer staff members or closed permanently, while other were so busy they did not have the time to bid or complete the project work.
  - The Nation lost some key staff who had to be replaced.
- **Access to buildings may sometimes be limited as they are in use by staff and/or guests.**
  - The Nation is working with input from building staff and occupants to avoid particularly busy times and to minimize disruption to daily operations.
- **Unanticipated cost increases to EEM equipment or installation compared to budget.**
  - The Nation reviewed its request for parking lot light poles and found that it could decrease the number of poles to be replaced. This decreased the cost of the poles and freed funds to be used to offset additional materials costs.



## Verification: Turning Stone Deemed Savings Approach

**Challenge:** Due to the presence of multiple factors, Turning Stone presents a unique challenge in terms in the verification of savings, so simply demonstrating baseline and after-project energy usage will likely not provide evidence of the real impacts.

- EEMs will not be individually metered, making isolation of each EEM difficult.
- TSRC is a large, multi-use facility with multiple maintenance and expansion projects potentially occurring each year with timetables that overlap this EEM project.

**Solution:** At Turning Stone, the Nation will calculate savings based on baseline data from the 2018 energy audit for each EEM. This method assumes that the stipulated monthly savings for each EEM will be held constant and that EEMs are successfully installed and operating properly. Annual energy savings, in kWh and therms as applicable, will be calculated and projected at the time of commissioning for each EEM. Monetary savings will be calculated using the resulting energy savings and the current utility rates for Turning Stone.





## Verification: Other Nation Buildings Whole Building Verification

- Use of proprietary benchmarking software beginning in 2018 has allowed the Nation to develop baseline data for each facility (other than Turning Stone).
- The software provides the ability for the user to flag a point in time where a change was made, allowing the Nation to note the implementation date of any EEMs made at a building.
- The Nation will use the program to compare the 12 months prior to implementation of EEMs to at least a 12-month period after implementation to demonstrate overall energy (electricity and/or natural gas, as applicable to individual EEMs) and cost savings realized.
- To account for multiple EEMs at a building, the Nation will flag each EEM implementation event date at each building.
- The analysis will take into account when each event occurred and will be used to explain fluctuations in energy usage and costs.



# Current Project Status

- September 2019 - Project kick-off
- December 2019 - Snow melt boiler was purchased and put into service.
- January – December 2020:
  - Project staff members created a comprehensive list of supplies and equipment needed.
  - Samples of selected EEMS were acquired and tested.
  - Photographs and details of light fixtures were taken and provided to potential vendors.
  - Supply Chain staff members began to actively solicit quotes and bids for supplies and equipment.
- January – December 2021:
  - Developed scopes of work for each project component and elements of each component (parts, installation, mechanical, electrical).
  - Prepared RFPs for elements of project components.
  - Solicited bids, conducted walk-throughs, answered questions, and accepted bids. Selected vendors.
  - Acquired DOE approval on project components that required approval.
  - Negotiated contracts with selected vendors.
- January - November 2022:
  - Prepared and installed project components as they became available.
  - Completed preparation work such as electrical wiring.
  - Installed many parts and fixtures.
  - Adjusted to constantly changing production and delivery schedules.



**Thank You!**

**Questions?**