



# 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, Associate General Counsel, Technical Contact
- Brad Miller, Turning Stone Resort Casino Facilities Director
- Paul Gwilt, Nation Facilities Director

### Budget

Federal funds requested: **\$1,000,000**

Cost-share proposed: **\$1,036,714**

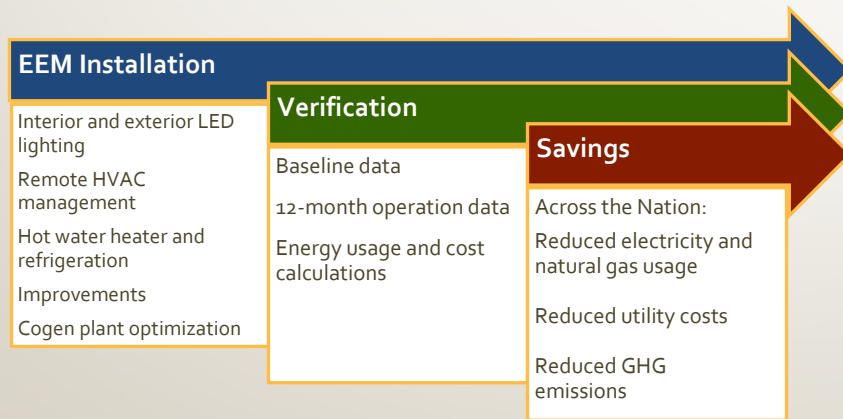
Total Project Costs: **\$2,036,714**

### 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.***



# The Project

The Nation has entered the second of this three-year project to implement numerous energy efficiency measures (EEMs) across multiple facilities. Preliminary work has been completed and a diverse array of energy-saving components will be installed over the course of this project year. EEMs to be installed include interior and exterior LED lighting retrofitting; heating, ventilation, and air conditioning-related upgrades; hot water heater upgrades; and, refrigeration condensing unit upgrades.

The project encompasses 27 buildings located on Oneida Indian Nation (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.



# 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.

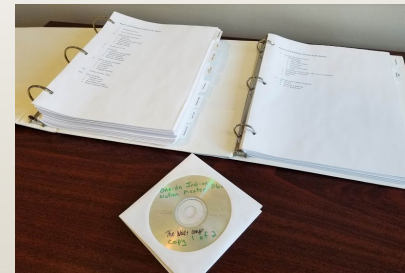
As part of a US Department of Energy *First Steps toward Developing Renewable Energy and Energy Efficiency on Tribal Lands* grant awarded in 2017, the Nation contracted with an energy consultant to provide a comprehensive analysis of energy consumption for approximately 40 buildings (~3.8 million square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



# EXAMPLES of 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) will be updated to LED fixtures. This will involve 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 will also be converted to LED and will consist 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 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.**



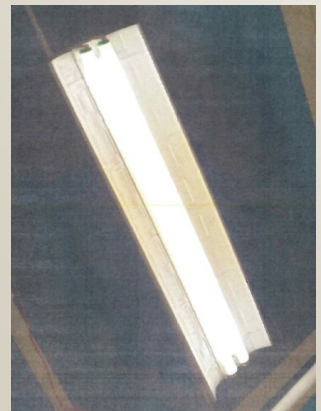
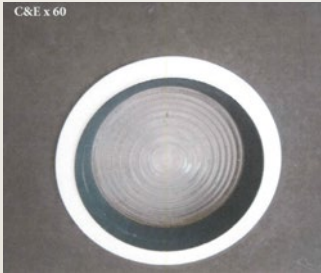
# COVID-19 Pandemic Impact

- On March 23, 2020, the Nation issued an Executive Directive declaring a public health state of emergency and disaster for the entire Nation and ordered the temporary closure of Nation operations and facilities due to COVID-19. To prevent the spread of COVID-19, the Nation closed all non-essential Nation businesses. Substantially all Nation employees were furloughed and activities on this project were largely suspended.
- A phased reopening of Nation facilities began on June 10, 2020 after the temporary suspension of operations and most furloughed staff members returned to work over the course of the following weeks.
- Project activities were restarted, and the Nation still seems on track to complete this project within the original timeline.





# Getting to Implementation



The first step toward implementation was to create a complete and comprehensive list of all equipment and supplies with model numbers and brands, where applicable, and identification information for each item.

- Nation Facilities Project: To ensure accurate bids, photographs of all light fixtures were taken and provided to lighting vendors.
- TSRC Project: Tours of the outdoor facilities for contractors were conducted to facilitate the bidding process and provide potential bidders with the information they need to submit appropriate bids.
- TSRC Project: The Nation secured the services of a green lighting and technology contractor to develop a lighting plan for the parking lots at the Turning Stone facility. The new plan reduces the number of fixtures and poles and increases the actual light provided to the space. See photo on following slide.



# Turning Stone Parking Lot Light Rendering





# 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.
- Samples of remote thermostats were ordered and tested by the Nation IT and Facilities Departments until a suitable option was identified.
- The Nation Supply Chain Department has the supply and equipment list and is actively gathering bids from appropriate vendors and contractors.
- The Turning Stone parking lot lights are the largest single piece of this project, requiring the replacement of the light fixtures, poles, and electrical network to connect the poles. Now that the preparation work (tours, designs, equipment list) has been completed, bids for the installations are being solicited.
- At all other Nation buildings, lighting retrofitting will be performed by three Nation-employed electricians; HVAC and other EEM installation and upgrades will be completed by a Nation-employed HVAC technician.
- EEM installation is targeted to be complete by September 2021 when the verification year will begin.



# Potential Challenges

- **COVID-19 – long-lasting impacts.**
- **Inclement weather in the winter months could impede installation of outdoor equipment, particularly the parking lot lights.**
  - The Nation plans to order all materials for outdoor installations during the winter to allow for work to begin in the spring when the weather improves.
  - Indoor project activities not affected by weather such as indoor lighting will be undertaken during the winter.
- **Vendors require identical information to ensure a fair bidding process.**
  - Photographs of all lighting fixtures taken and provided to lighting vendors.
  - All vendors bidding on parking lot lighting project taken as a group for tours with related Q&A sessions.
- **Access to buildings may sometimes be limited as they are in use by staff and/or guests.**
  - The Nation is creating a schedule of installation 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 will review and discuss with Nation leadership and the DOE grant staff to address if this occurs.



## Verification: Turning Stone Deemed Savings Approach

- Turning Stone is a challenge due to the presence of multiple factors, 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.
- *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 denote 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 have created a comprehensive list of supplies and equipment needed.
  - Samples of selected EEMS have been acquired and tested.
  - Photographs of light fixtures have been taken and provided to potential vendors.
  - Tours of the facility with Q&A sessions have been conducted for contractors bidding on large parking lot projects.
  - Supply Chain staff members have begun to actively solicit quotes and bids for supplies and equipment.
- Strongly anticipate completing indoor activities and preparation for outdoor activities during the winter of 2020-2021.
- Plan to initiate outdoor activities in the spring of 2021.



**Thank You!**

**Questions?**