**Project Background**

The Empire State Plaza campus is among the largest users of energy within the state-operated Capital Region portfolio of buildings. Consequently, it has been a continuous focus of productive energy efficiency projects for more than 20 years. These initiatives include installing:

- An automated lighting control system,
- State of the art automated heating and cooling controls,
- Extensive efficiency upgrades to the central chiller plant at the plaza and the Sheridan Avenue steam plants.
- New LED lighting systems for the New York State Museum, Library, parking garages and other areas.

Combined, these efforts have reduced energy and environmental impacts of the Plaza by 40 percent or more since 1990.

That is an impressive number, but we are not done.

Improving how energy is produced and delivered to the plaza complex is the next step in our energy conservation and cleaner energy production efforts. A number of options were considered to meet the goal, including solar, geothermal (underground), and wind. Unfortunately, at this time, these technologies are not sufficient to supply the vast amount of thermal and electrical energy needed to operate such a large facility in a climate that requires either heating or cooling throughout most of the year.

We ultimately concluded that the most efficient and environmentally-friendly way to supply the plaza with the necessary energy is to upgrade the Sheridan Ave. Steam Plant to a Cogeneration facility, also known as Combined Heat and Power (CHP).

**Project Facts**

1. **What does the project involve?**

   Empire State Plaza is a 98-acre complex located in downtown Albany that houses state government buildings, The Egg, and a convention center. It currently utilizes electricity and natural gas from National Grid diesel fuel to power its emergency generators and steam from the Sheridan Avenue Steam plant to heat and cool its space. The new 16-megawatt system would replace the obsolete diesel fuel-operated emergency power system and offset the less-efficient existing gas boilers. It would allow for on-site power generation from clean-burning natural gas-fired turbines, providing 90 percent of the power needed to operate the Plaza.

   The new system will result in an estimated $3 million in annual energy savings to state taxpayers. It will also reclaim the heat generated by the new turbines to create steam to meet the majority of heating and cooling needs for the entire plaza and provide sustained emergency power during a utility outages.

   The new system will not require new building construction, but will re-purpose an existing building (the former RDF facility on the Sheridan Ave. complex property).

2. **What are the goals of the project?**

   This project will accomplish a number of goals:

   - Energy efficiency and the reduction of operational costs
   - Reduce air and greenhouse emissions
   - Upgrade the emergency power system
we will be able to increase energy efficiency by 30 percent. Through the recovery of the heat generated by the electrical generation process, the project will reduce the operation of the existing less energy efficient boiler plant. The new system is far more efficient than the existing equipment.

Removing the plaza load from the statewide electrical system will result in a reduction in the electricity generated by inefficient gas and oil-fired power plants that currently operate to serve the marginal loads in the state. In addition, the older diesel-fueled emergency power system will be upgraded to the latest technology which will further reduce emissions in the local area.

Overall this results in a reduction of greenhouse gas emissions, as well as reduced local emissions of air pollutants, such as nitrous oxides (NOx), at the plant.

As has been demonstrated and proven by other entities such as Albany Medical Center, Union College, New York Presbyterian Hospital, Cornell, Burrstone in Utica, and many more, cogeneration and microgrids provide efficient, cost-effective and resilient energy solutions.

3. Were alternatives to Natural Gas considered?
a) Can we use solar or wind as a power source?

- **Solar PV:** The amount of solar PV required to run the plaza would cover more area than is available on every rooftop in downtown Albany (roughly 1,000 acres of solar PV would be needed to power the entire plaza). Even if this were possible, a Solar PV system would require a very large battery (1-2 acres) to provide power at night or during overcast conditions. It would also fail to offset the operation of the existing boilers that generate the steam needed to heat and cool the plaza.
• **Wind:** Building a wind turbine in Albany is not feasible as the area does not receive a significant amount of wind given the location within the Hudson River Valley. Additionally, a wind generator would face the same challenge as solar PV as there is not enough land area available in the immediate area to site such a system.

b) Why can’t renewable energy be built at a different location and transmitted to power the plaza?

Even if a suitable location could be found for a renewable generation source, it would be a long distance from the plaza. That distance would make any remote system subject to the same vulnerabilities as the existing power grid, negating the resiliency benefits of the system to the plaza. In addition, offsetting the electrical use of the plaza with renewable sources would not provide a reduction in local emissions because the existing steam plant would still be required to provide the steam necessary for heating and cooling. There is currently no viable renewable source of high-pressure steam.

c) What about using geothermal energy to heat and cool the plaza?

The Power Authority is a strong proponent of geothermal technology as it is an excellent clean energy source for a facility to utilize to reduce its environmental impact; however, the Empire State Plaza is not an ideal application for its use for several reasons:

- Utilizing geothermal heating and cooling at the plaza would double or triple the electrical needs of the plaza while at the same time creating an increased dependence on the electrical grid. In the event of a blackout, heating and cooling at the plaza would be lost entirely. A loss of heat at the plaza during a winter month, even for one night, would likely cause significant and costly damage to the heating and cooling equipment.
- The air-handling units currently supporting the plaza's heating and cooling system are too small to be converted for use in a geothermal system and would need to be replaced with much larger units at an extensive cost.
- The piping system currently used to transport steam for the heating of the plaza cannot be repurposed to transport water. The piping would need to be replaced with significantly larger pipes at an extensive cost.
- The proposed alternative to the disruption and cost of drilling hundreds of wells to accommodate a geothermal system at the plaza is to utilize the Hudson River as a geothermal heating and cooling source. The Hudson River is currently being utilized as a water source in warmer months to act as a heat sink in lieu of cooling towers; unfortunately, the river cannot be utilized in colder months (Dec. through March) as the water reaches freezing temperatures and cannot be used to produce heat as part of a geothermal system.

New York State is committed to furthering the implementation of geothermal technology throughout the state and has launched the Geothermal Clean Energy Challenge initiative, which is designed to help stimulate financing and installation of large-scale geothermal systems at state and local governmental entities, public and private schools and healthcare facilities.

d) Why not utilize fuel cell technology?

The most mature and developed fuel cell technologies do not operate at a high enough temperature to produce the high energy steam required at the plaza. Fuel Cells are not capable of varying output quickly enough to follow the loads at the plaza.

e) Why not only replace the aging diesel generators?

Replacing only the existing emergency generators with new units would not reduce the emissions associated with the current operation of the steam boilers. In addition, the diesel generators do not provide sufficient power to utilize the plaza as an emergency shelter as the generators are designed to provide only the minimum power necessary for occupants to vacate the building during an emergency.  
*(Updated 12/6/17)*

4. What Environmental Studies were conducted to assess the impact on the environment and health of local residents? Can we see the study?

Environmental studies will be conducted as part of the air and environmental permitting of this project and will be conducted when the project design is finalized. NYPA has committed to performing a full Environmental Impact Study to determine the affect this project will have on the environment. It is anticipated the permitting process will begin in spring 2018, at which time environmental studies will be conducted and be available for public review and comment. In addition, the proposed cogeneration plant will meet strict DEC requirements for noise.  
*(Updated 12/6/17)*

5. What are the long-term plans for the energy needs of the plaza?

The Empire State Plaza is a very large facility requiring a large amount of electrical energy and heat to operate. This project will provide a large portion of the energy needed for the plaza, but not all, especially during daytime peak hours. OGS will continue to improve the energy efficiency of the plaza to reduce its associated energy use and emissions. These future efficiency projects will include measures to incorporate renewable energy sources such as solar photovoltaic systems or other renewable energy technologies as they come to the market. CHP technology is currently the most efficient and environmentally friendly measure that can be taken to address the overall energy use of the plaza.
6. Why does Albany need a microgrid? Who will benefit?
A microgrid is an electrical system that is capable of operating on its own without needing energy from the electrical grid. Microgrids have the advantage of remaining operational in the event of a long-term electric service outage. As an example, many microgrid systems in New York City, such as NYU, were able to maintain electrical and operation during the blackout caused by Superstorm Sandy. The new plaza microgrid will allow state officials to continue to perform their duties in the event of a widespread outage caused by weather or other hazards. Additionally the plaza will be able to serve as a shelter for the public as well as a staging area for recovery teams and other emergency resources. (Updated 10/18/17)

7. How will project participants communicate with the community in the future?
The webpage for this project will be updated to keep the community informed on the project’s progress. In addition, public participation will include open dialogue and communication with the community and project stakeholders before and during the permitting process.

8. What are the benefits of the project to the local community? Will the project reduce the rates the community is currently paying?
While the project will not reduce local utility rates, it will allow Empire State Plaza to run almost entirely independently from the electric distribution system. This is a vital benefit to the community because this facility can be used as a place of refuge in the event of widespread disaster or long-term power outage. In addition, the existing equipment in operation at the plant will be replaced or offset in such a way that local air pollutants will be reduced.

The plaza microgrid can also be expanded into a larger community-based system for downtown Albany under NYSERDA’s NY Prize Competition. A feasibility study was completed in July 2016 as part of the NYSERDA NY Prize Competition and additional funding was recently awarded to conduct detailed engineering design and business plans for this future expansion project.

Noise and air pollution associated with the obsolete emergency diesel generators will be virtually eliminated, and tractor-trailer trucks delivering fuel will be reduced.

NYP A will host a job fair with project contractors within the local community to support local employment prior to the construction of the project. At a minimum, all major contractors on the project will participate. (Updated 12/6/17)

9. Will the project use local labor/contractors and local businesses for construction?
Yes.

The project will create work for local electricians, plumbers, steamfitters and other trades who will be paid at prevailing wage rates. We cannot comment on which businesses will receive work until we are able to make a contract award following the proposal evaluation period. We expect to award the project in the first quarter of 2018.

Estimated Project Schedule

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10. What is the project timeline?
NYP A has received all the proposals in response to its RFP for this project and we are currently evaluating them. We expect to select vendors for the project in the first quarter of 2018.

Initial project construction is expected to begin during fall 2018 and will take approximately 18-24 months, with a target completion date of 2020. (Updated 10/18/17)
11. What will the construction impact be?

a. Will there be increased traffic and noise pollution during construction? How will project participants mitigate any adverse conditions?

During the construction period, most work will take place during business hours and will be conducted primarily inside the existing building. Public roads may be used to accommodate necessary cranes on a limited basis.

All materials transported over city of Albany roads will be coordinated with the City to minimize any potential disruption to vehicular or pedestrian traffic. The new cogeneration plant will meet strict DEC requirements for noise. The new turbines will be installed inside the building within acoustic enclosures.

b. Will any work be carried out during the night?

We do not expect any work to be completed at night at the Steam Plant. There may be some work completed inside the Empire State Plaza at night, but this will have no adverse impact upon the surrounding community as it will be within utility areas not visible or accessible to the public.

12. Is the RFP available for our review?

TBD

13. Is NYPA in a position to execute a community benefits program?

Our team has been reaching out to a variety of stakeholders to educate and inform them about the proposed project. We are encouraging an open dialogue with our stakeholders and informing them to let us know if they have any ideas and recommendations on the project. At this point, we are gathering information to determine what our options are as we move through the project timetable. (Updated 12/6/17)

For further information, please contact:
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www.nypa.gov/EmpireStatePlazaMicrogrid.

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