Challenge
A large healthcare company produces lifesaving medicines at its manufacturing plant in New York State. Due to the critical nature of the products produced at this facility, the water and steam that comes into contact with their products must be highly purified. This process, which takes place on site, requires a tremendous amount of steam. The high-energy requirements of the company's clean rooms require large amounts of electrical power as well. Furthermore, production increases planned as part of a facility extension are expected to drive a 4-megawatt (MW) power deficit that the local utility cannot meet using its existing infrastructure. With such a power demand, the company wanted to explore options for reducing its reliance on grid energy.

Solutions
The New York State Pollution Prevention Institute (NYSP2I) was tasked with conducting a building-retuning training to train the company's maintenance, operations, and environmental staff on energy-saving opportunities within the facility, and to assess the potential for incorporating renewable-energy generation and energy storage into the facility.

Under a grant from the National Institute for Standards and Technology (NIST), administered by Empire State Development (ESD) in 2013, NYSP2I developed a curriculum for training owners and managers of industrial facilities in building retuning. An abbreviated version of building recommissioning, retuning is a detailed effort to reset and readjust all of a structure's energy systems. NYSP2I staff led a two-day training on the company's premises. They instructed the attendees on how best to perform periodic energy assessments in their buildings.

In addition to the training, NYSP2I staff investigated the feasibility for generating renewable energy on site as part of the company's planned physical growth. They found this solution to be impractical due to the large electric load the new facilities were expected to drive.

Results
• Fifteen staff members from multiple facilities were trained on general building energy, compressed air systems, boilers and steam systems, and industrial refrigeration.
• A 4.2-MW, turbine-driven generator powered by natural gas with a heat-recovery steam generator (HRSG)—with a turbine featuring high heat quality—was chosen.
production facility would demand. However, the team completed a combined heat and power (CHP) feasibility assessment to better understand the company’s energy loads, to predict the loads required to cover the new facility, and to develop a CHP system that would meet those needs. Lastly, they explored available financial incentives to help offset some of the costs of a CHP system.

Results
NYSP2I supported the pharmaceutical company with its energy initiatives in the following key ways:

• Fifteen staff members from multiple facilities were trained. Two training cohorts were held October 9-10 and October 23-24. These covered general building energy, compressed air systems, boilers and steam systems, and industrial refrigeration.

• To account for the facility’s steam loads, a 4.2-MW, turbine-driven generator powered by natural gas—with a heat-recovery steam generator (HRSG) was chosen. The turbine featured high heat quality, making it ideal. Its projected steam output could supply approximately 71% of the company’s load. The generator could cover 100% of the company’s electrical shortfall. The total cost for the system is estimated to be $8.53 million.

  • Operating and maintenance costs are estimated to be $2.1 million annually, and the combined heat and power plant is estimated to save $3.04 million in energy costs annually.

  • The expected simple payback is 9.1 years. When considering the cost of improving the electrical utility infrastructure, the payback drops to an estimated 2.3 years.

• The most notable financial incentive identified during the energy analysis was a 10% federal tax credit for CHP owners. Additional opportunities included financial support for qualifying new construction projects and several demand response programs.