



School began as normal for the Binghamton City School District's MacArthur Elementary School in September 2011.

For students, the first day of school would also be their last in the building. On what would have been the second day of school, the community was devastated by flooding as a result of Hurricane Irene. The elementary school was flooded beyond repair and needed to be replaced.

The District's vision for its new school included a state-of-the-art educational facility that would be cost-effective to operate and a positive addition to the local community. It became clear early in the process that reducing energy consumption was key to community stakeholders. The new 130,000 sq. ft. building serves 450 students in grades pre-K-5, and features a core building and three classroom wings, with a total of 42 classrooms. An energy model of the proposed design using eQUEST software was created, with frequent iterations and revisions throughout the design phases to help inform the design and determine progress toward the net-zero-energy goal.

- 1 Energy modeling and analysis showed energy cost savings of 53% relative to a baseline design, without any renewable energy. With a PV system included, modeled cost savings is 82.6%, with a very low Energy Use Intensity (EUI) of 10 kBTU/ft<sup>2</sup>-yr.
- 2 These results were used to document the maximum possible points for credit LEED EAc1 - Optimize Energy Performance, with additional renewable energy, regional and exemplary credits, for a total of 28 points in support of the goal of LEED Platinum certification.
- 3 ECMS used in the analysis included: variable speed pumping, energy recovery ventilation, advanced lighting and daylighting controls, exterior lighting, improved building envelope (glazing), and high-efficiency service hot water. Estimated savings are 703,000 kwh in electricity and 257 therms natural gas annually.
- 4 Based on the energy modeling analysis, the District received a NYSERDA New Construction Program incentive offer of \$242,178, more than twice the original estimate initially provided by NYSERDA. The Solar PV system should receive an additional \$150,000 incentive from the NY-SUN Initiative.

