UMBC's Thermal Energy Storage System

This 60-foot tall tank is the heart of UMBC's thermal energy storage system. Chillers in the Central Plant "charge" the tank at night, chilling and storing 1.6M gallons of recirculated water to 40° F. The following day, the tank is strategically "discharged" to help cool the campus, so less chillers need to run during the day. Utilizing thermal energy storage reduces the load on the electric grid during peak daytime hours, which makes the grid more reliable and reduces the need for additional power plants and transmission lines. Beyond the social and environmental benefits, the thermal energy storage system provides UMBC with economic benefits: electricity costs less at night, lower peak demand charges, and rebates for participating in demand curtailment. These energy rebates were used to hire UMBC's Environmental Sustainability Coordinator.

Through complex upgrades to pumps, piping, and controls, the Chilled Water Optimization project will significantly improve the efficiency of the Central Plant and cooling for most of the campus. This project will reduce UMBC's annual energy usage by 5,700,000 kWh and reduce annual GHG emissions by 3,100 MT eCO_2. By using Energy Performance Contracting, this $6M project will essentially pay for itself in about 10 years. This is another example of Facilities Managements cost-effective approach, which makes conservation the top priority.

Compare this $6M investment to conserve 5,700,000 kWh/year with a solar project capable of producing 5,700,000 kWh/year. It would require 475,000 square feet of solar panels. That's 11 acres, the size of 170 tennis courts. Not counting the costs of land or structural upgrades to roofs, such a solar project would cost over $30M and have a payback period of over 50 years. The Chilled Water Optimization project costs one-fifth as much and the payback is five-times faster.