

**Grid Connected Solar PV with
Battery Energy Storage System
Peak Shaving in a University
Building, Illinois, US**

Background

TROES is a Canadian company specializing in advanced distributed energy storage technologies, product and solutions. TROES has developed a grid connected **Solar PV and Battery Energy Storage System (BESS)** solution, that addresses the power demand issues of commercial and residential buildings. This system alleviates issues of excess demand on the grid by charging the BESS during off-peak period using grid or solar, and using the BESS to support building demands during peak period.

CLIENT CHALLENGE

Our client university in Illinois has multiple buildings with high power requirements like any other college campuses or universities. The grid purchasing costs for them consists of energy charging and demand charging, and demand becomes a large part of their bill when they use a lot of power over a short period of time. The university was committed to showcasing application of renewable technology in conjunction with energy storage system to solve this issue of excess demand charges, and the locale was suitable for the installation as well, since Illinois has good solar insolation and its utilization would help alleviate power demand problems.

In this project, the solar PV was integrated with a Battery Energy Storage System to ensure application of solar PV at highest efficiency. That way, the power generated by solar panel could also be used to respond to the unpredictable nature of peak demand.

FINANCIALS AND BENEFITS

The system cost is US\$290,000. The local electricity rate is US\$0.08/kWh. We assume 8 hour's sunshine in a day. The yearly consumption saving would be US\$23,330. With a demand reduction of US\$3000, the total saving would be US\$26,330.

Initial cost	Daily usage	Yearly revenue	Payback
US\$290,000	800kWh	US\$26,330	6.9 yrs

About the system:

The system comprises of a **250 kWh BESS** charged by a **100kW solar PV array** and the grid. This setup will be able to support the buildings' power demands during peak periods using the energy stored. Since the BESS is charged during off-peak period with either solar PV or the grid, significant amount of bill savings can be made.

