

## PEAK SHAVING

### Grid Connected Solar PV with Battery Energy Storage System



#### CLIENT CHALLENGE

The demand for EV charging infrastructure is growing rapidly. With this, electricity consumption costs and transformer overloading have become big concerns to infrastructure owners. Our client in Ontario, Canada sought to utilize solar PV and energy storage system to reduce the demand stress on grid and make bill savings by reducing grid usage during peak periods.

The charging station has Level 2 and Level 3 DC EV chargers that can charge EVs in a short period of time due to high charging power. The power demand of a Level 3 charger is normally higher than 30 kW and in cases above 100 kW as well. So, usage of Level 3 charger during peak hours has significant impact on electricity bills of the client. The integrated solar PV and BESS has given a smart charging solution to our client without overloading the existing system and eliminated the inconvenience of charging EVs during peak hours.

#### BACKGROUND

TROES is a Canadian company specializing in advanced distributed energy storage technologies, product and solutions.

TROES has completed a grid connected EV Charging Station (Level 2/3) project with Solar PV and Battery Energy Storage System (BESS).

This setup will serve as a power source for electric vehicles in commercial and residential buildings in urban areas. It will be pivotal in relieving the burden of excess power demands on the grid by charging the BESS during off-peak time & using the BESS to charge EVs during peak period.

# RESULTS



**US\$95,000**

**Initial Cost**



**8 Hours**

**Daily Usage**



**US\$23,966**

**Annual Savings**



**~4 Years**

**Payback Period**

## FINANCIALS & BENEFITS

The initial system cost is US\$95,000. Assuming 2066 hours of sunshine in Toronto with a level 3 EV charger usage fee of US\$0.21 per minute (US\$0.25/kWh), and level 2 EV charger usage fee of US\$0.01 per minute (US\$0.10/kWh), the annual charging cost will be US\$14,286. The system in this setup will provide an annual savings of US\$87,600 and payback period of around 4 years.

## ABOUT THE SYSTEM

The system comprises of a 100kWh BESS charged by a 10-kW solar PV array and the grid, powering Level 3 and Level 2 EV chargers in the station. The Level 3 charger in this setup charges an ordinary EV up to 80% in just 30 minutes. The BESS allows EV charging, avoiding the peak hour costs of grid electricity.



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