Team Awesome

Solar Data Visualization

October 25, 2016

**Solar Data Project Briefing**

Grid Tie Inverters

* The grid tie inverter supplied by the solar panel takes priority over the power supplied by the power company to the facility (i.e. 1000 watts needed, solar panel provides 600 watts, need 400 watts from power company)
* Does not store energy, only supplemental while power is being consumed

Power surplus from solar panel

* Energy going back to the grid is registered as energy going out, so excess power creates charges to the facility.

Calculating power produced over time by panel

* where rate is the rate per kWh from the energy company

Data accuracy

Some data from the panels is actually missing, caused by power outages, equipment failures, temporary disconnection from the internet, etc. No data will be received if these issues occur.

Belize power rates

http://www.bel.com.bz/Rate\_Schedule.aspx

(bill cost per kw/h)/60 for kw per minute

Client contact information

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Requirements

* Savings on monthly, weekly, daily basis to report to each school
* Approximate the accuracy (as a percentage?) for a given window of time
* Include longitude and latitude as fields for each facility
* Savings expressed as kWh and dollars
* User supplies rate per kWh (rate can change based on total usage)
* Comparison between energy usage at different points in time for a facility
* Each facility has two banks of panels; show outputs relative to one another
* Minimum window of an hour of output
* Developer friendly API—very important
* Consider proposals for follow-up projects—i.e. Error reporting, diagnostics, etc.
* Would be optimal if the new web software was more performant than existing
* Needs to be integrated with existing solution
* Will be hosted on school provided Linux server

Specifications

* Web-based solution
* Need only to use existing data

Out of scope

* Admin page site to add sites
* What percent inefficency due to panel angle
* Handle power produced during night times
* Monitoring over-production
* Exporting data to file/report