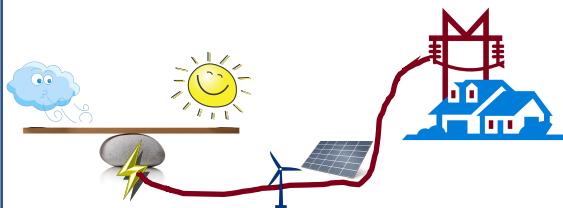




## BACKGROUND

Happy-4 is a project to get the most stable clean energy resource through the combination and ratio optimization of solar and wind energy at specific location. Based on the actual electricity consumption data, this project will further return optimized number of solar panels and wind turbines to meet the system energy consumption.



## FUNCTIONS

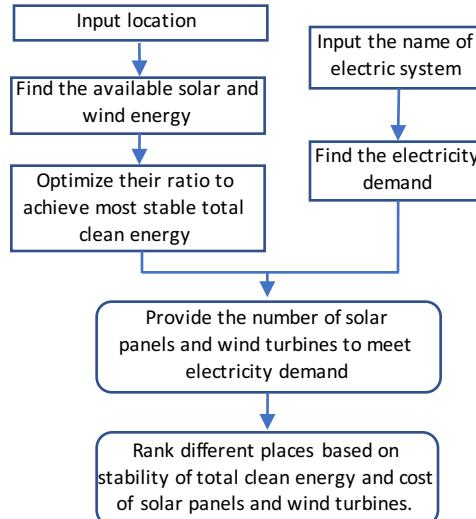
□ Our project will realize the following functions:

- Automatically download the radiation and wind speed data of specific location based on user's input;
- Calculate the solar and wind power through System Advisor Model (SAM);
- Optimize the ratio between solar and wind power to get most stable clean energy power;
- Determine the number of solar panels and wind turbines to provide clean energy and meet the energy consumption of specific electric system.

□ Data source:

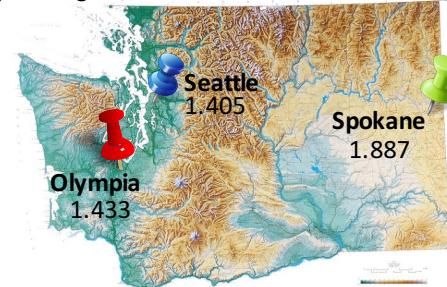
- Radiation and wind speed data is from National Solar Radiation Data Base (NSRDB), DOE;
- Software development kit (SDK) in SAM comes from National renewable energy laboratory (NREL);
- Electricity demand comes from U.S. Energy Information Administration.

## DESIGN

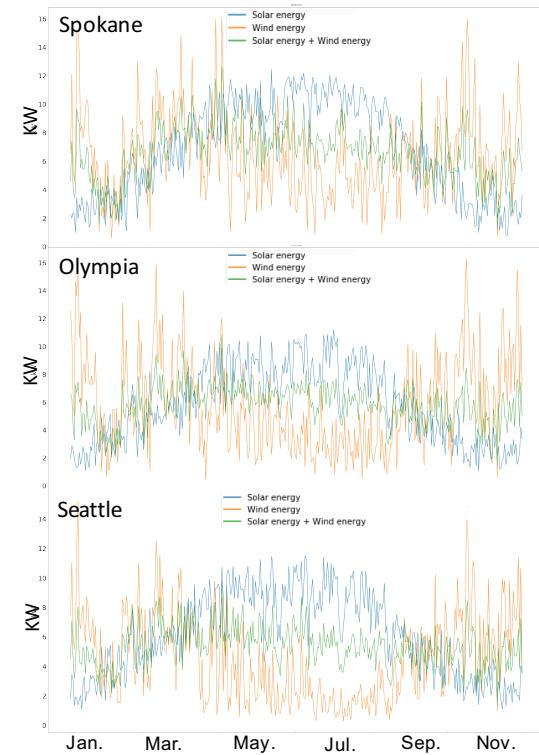


## OUTPUT

□ Standard deviation of total clean energy after optimizing the ratio between solar and wind energy:



□ Stabilization of total clean energy



□ Amount of solar panels and wind turbines in Seattle to meet the electricity demand.



<https://github.com/cchvv/Project-Happy-4>