



## Assessing Solar Potential in My Neighborhood

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*Neighborhood: Between NE 65th Street and NE 63rd Way, City of Redmond*

### Problem Statement

How can I raise awareness of solar potential in my neighborhood, and encourage my neighbors to solarize?

### Impact Statement

If I solarize my home, I will zero out my energy consumption as well as my energy bill. Yes, it costs a lot for the initial installation, but there are great incentives that reduce this cost. Plus, the system pays for itself in 7-10 years.

At that point, my energy is free for the rest of my life. If I can demonstrate that solarizing my home is such a fantastic deal, then I can convince other homeowners in my neighborhood to solarize their homes.

If many people in my neighborhood solarize, I can share the data with my city government to encourage them to support the momentum I have helped generate by offering additional incentives or stronger green building codes for all homes in my city.

If my city becomes a solar city, we can catch up to and surpass the carbon emissions reduction goals we committed to as part of the [King County Cities Climate Collaborative](#). If the K4C surpasses its goals, we can get other cities to join the collaborative effort and we will become a model for the region, the nation, and the world.

Along the way, three other benefits are realized.

1. Sustainability Ambassadors will receive funding through our partnership with [Sphere Solar Energy](#) to support a paid internship to manage the Solar Neighborhood Challenge.
2. We will learn a lot about [green jobs in the solar sector](#).
3. More underdeveloped communities will prosper from new solar projects through the [international charitable work](#) of Sphere Solar Energy.

## Background Knowledge

- Imagery and 3D modeling and shade calculations from [PVWatts](#).
- Weather data from the National Renewable Energy Laboratory (NREL).
- Utility electricity rates information from [Clean Power Research](#).
- Solar pricing data from NREL's [Open PV Project](#), [California Solar Initiative](#), and [NY-Sun Open NY PV data](#).
- Solar incentives data from relevant [Clean Power Research](#), Federal, State and local authorities as well as relevant utility websites.
- Solar Renewable Energy Credit (SREC) data from [Bloomberg New Energy Finance](#), [SRECTrade](#), and relevant state authorities.
- Aggregated and anonymized solar cost data from [Aurora Solar software](#).

[Sustainability Ambassadors' Solar Neighborhood Challenge](#) (Scroll down to see FAQ)

[Solar Neighborhood Information Brochure](#)

[Green jobs in the solar sector](#)

[International charitable work](#) or [Sphere Solar Energy](#)

## Alignment with Relevant Community Goals

Solar power is a very effective way to reduce a city's carbon footprint. Many cities in King County have pledged together to set goals and timelines for carbon emission reductions. These commitments are part of the [King County Cities Climate Collaborative](#) (K4C).

The City of Redmond's plan includes *"a commitment to reduce community-wide emissions by 80% by 2050, with an aspirational community-wide greenhouse gas reduction target of carbon neutrality by 2050. It identifies 24 strategies and 169 actions to work towards these goals."*

Actions in the City of Redmond's plan are categorized into six key sustainability focus areas – Transportation and Land Use, Buildings and Energy, Material Management and Waste, Natural Systems, Water Management, and Climate Change and Resilience."

To meet the goals of the Energy section of the Redmond Plan, solar is a very big component. So it will really matter if lots of homes invest in solar and if the city can offer incentive packages to support the transition.

Here are more examples of how cities are trying to reduce their carbon footprint through policy making, goal setting, and projects.

[Washington has a goal of 100% clean, renewable energy by 2045](#)

[Reducing Redmond's Emissions by 80%. by 2050](#)

[King County Strategic Climate Action Plan](#)

[King County Cities Climate Collaborative](#) (also see [K4C Climate Action Tool Kit](#))

[Seattle Office of Sustainability and the Environment](#)

[Seattle Climate Action Plan](#)

[Bellevue Environmental Stewardship Plan](#)

[Kirkland Sustainability Master Plan](#)

[Redmond Sustainability Plan](#)

[Issaquah Climate Action Plan](#)

[Burien Climate Action Plan](#)

[Edmonds Climate Action Plan](#)

[Sustainable Shoreline](#)

[Bothell Sustainability](#)

### Document current conditions (Using the [PVWatts Calculator](#))

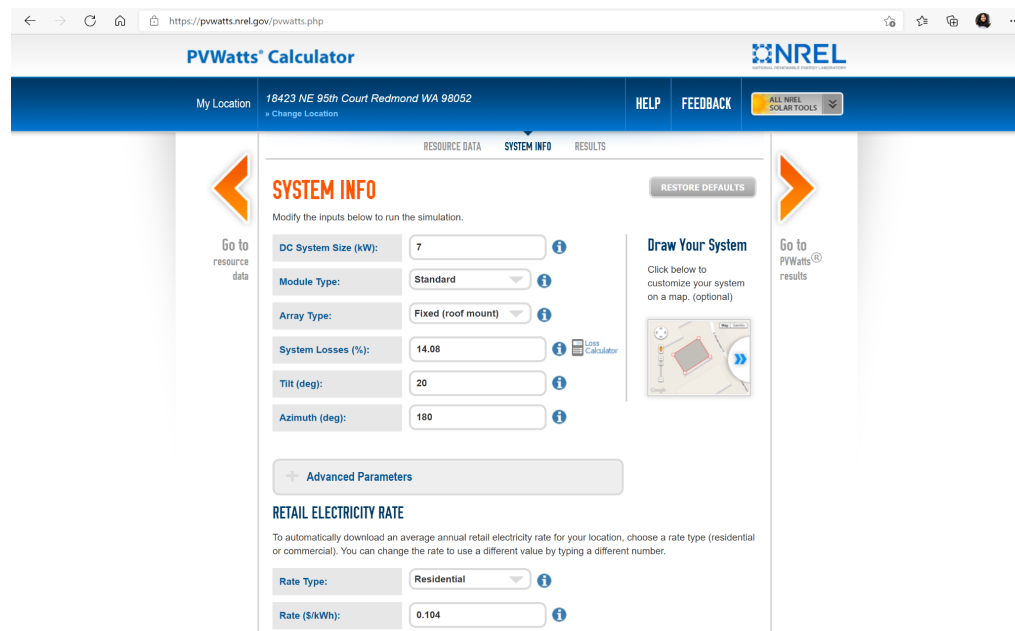
1. How many households are in my neighborhood?
2. How many homes already have solar panels in my neighborhood?
3. Estimate the number and percent of total homes in my neighborhood that have the best sun exposure
  - a. Identify the approximate solar array size for each home in my neighborhood using:
    - i. The following reference table for an average home
    - ii. Additional research on the array size needed for each home based on the energy demand and sunlight exposure.

| <i>Scenario</i>                  | Approximate cover of energy demand | Approximate array size to use in PVWatts |
|----------------------------------|------------------------------------|--|
| <i>Cut your bill in half</i>     | 50%                                | 4 kW                                     |
| <i>Net Zero Energy</i>           | 100%                               | 7 kW                                     |
| <i>Become an energy producer</i> | 110%                               | 8 kW                                     |

- b. Go to <https://pvwatts.nrel.gov/pvwatts.php>, input your address and zoom in using the plus icon.
    - c. The map generalizes your location, so you may need to move the pin to the top of your house. Once positioned click on System Info at the top of the website:



- d. Once you've selected System Info, enter the correct information for each textbox - click on the [i](#) to learn more.
- e. Fill in DC System Size
- f. Change the array type to fixed (roof mount).



- g. Click done and move to results to see data for your average solar radiation, savings, and AC Energy.

## Identifying Stakeholders

| STAKEHOLDERS  | INTERESTS  | GOALS   | APPROACH   | NOTES  |
|---|--|---|--|--|
| My parents  | They love me. Climate action. Saving money   | Add panels to your home, talk to Sphere Solar, get a free quote                         | Informing and encouraging  |  |
| Neighbors we know   | Saving money, learn more about panels  | Get them to add panels to their homes, talk to Sphere Solar, get a free quote           | Emailing, door-to-door, calling, meeting   |  |
| Neighbors we don't know                                   | Saving money, becoming more sustainable  | Adding solar panels to their home   | Door-to-door   |  |
| Neighborhood organized in an HOA (HomeOwners Association) | Creating a more sustainable neighborhood, saving money, increasing property value                          | Adding solar panels to homes, increase total neighborhood value/potential               | Stuffer in membership snail mail, E-Newsletter to membership, member meeting, door-to-door |  |
| Green Realtors (Redfin, Skyline, etc.)                    | Selling homes with great energy savings + increased property value   | Adding solar panels to homes  | Calling, emailing  | See: <a href="#">Green Homes for Sale in King County</a> |
| School Green Team   | Reach more neighborhoods, inform student body via Earth Month Assembly, Measure impact                     | Gain a lot of data on solar potential for houses, adding solar panels to homes          | Calling, emailing, talking (face-to-face)  |  |
| <a href="#">Rotary Club</a>                               | Community Service Org  | Adding solar panels to their homes, spread plan/impact                                  | Calling, emailing  |  |
| <a href="#">Kiwanis Club</a>                              | Community Service Org + Key Club   | Adding solar panels to homes, spread plan   | Calling, emailing  | Funds key clubs in schools!                              |
| Friends   | Saving money, Environmental Benefits   | Adding panels to their homes  | Calling, email, talking to them  |  |
| City staff member   | Promote Redmond, provide residents with an ideal city, aligning with the Environmental Stewardship Program | Spread news of the challenge to more people, encourage use in buildings across the city | Emailing   |  |
| Chamber of Commerce                                       | Saving money, Environmental Benefit  | Adding panels to businesses, spread news of the project through this network            | Calling, emailing  |  |
| City council member                                       | Saving costs, re-election, pride in Redmond, Meeting K4C commitments                                       | Spread news of the challenge to more people, encourage use in buildings across the city | Emailing   |  |

#### APPROACH STRUCTURE:

- Solar panels are cool! This is why you should care!
- These are steps you can take!
- We're partnered with a super cool local small business called Sphere Solar! They can get you a free quote! They're also building wells in Kenya with the profits!

#### Implementation Steps

1. Define the parameters or boundaries of my neighborhood solar inventory.
2. Practice using [PVWatts Solar Calculator](#) to learn about the solar potential of my own house.
3. Use the same tool to estimate the solar potential of the rooftops in my neighborhood that have the best sun exposure. (Choose as many as you have time for- aim for 5 or more)
4. Create a chart of this data to see the totals.
  - a. Total system output per year
  - b. Optimal solar array size
  - c. Annual value
  - d. Estimated annual environmental impact of the recommended solar installation size. Use the [EPA greenhouse gas equivalencies calculator](#).
    - i. Metric tons of Carbon Dioxide saved
    - ii. Number of passenger cars taken off the road
    - iii. Number of trees seedlings grown for 10 years
5. Prepare a final report.
6. Report to stakeholders (reference the stakeholders table above), to encourage residential solarization in my neighborhood and across all neighborhoods in my city (speak with city councils to encourage information on city website)

#### **Describe the audience you will present your work to. Identify the content and media you will use to communicate your project and its impact.**

1. See the list of all stakeholders above
2. Other Sustainability Ambassadors to inspire replication
3. Create an infographic report
4. Post a series of short blogs chronicling my project
5. Post a series of short videos documenting my project
6. Repurpose my videos and blog posts through social media accounts of...
  - a. Sustainability Ambassadors
  - b. All relevant stakeholders who also have a social media presence

**This is it! Document the impact your project had with evidence and data.**

To be developed...

**Develop a series of 5 short videos of your plan, process, and results. (1-3 minutes)**

1. My plan and intended impact, relationship to community goals, stakeholders who need to know.
2. Here are the steps I plan to take, the resources I will need, and the experts I will consult.
3. The story of how I'm implementing my plan, the steps, insights, and obstacles.
4. Here is the result, my impact data, I did it! I learned a lot.
5. Here is the math story of projected, collective impact if others did what I did.

**Reflect on your experience**

1. Post a series of short blogs chronicling my project
2. Post a series of short videos documenting my project
3. Describe new insights, new stakeholder connections
4. What new skills did I learn?
5. How do I feel about the impact I achieved?
6. What is the mathematical amplification if lots more people did what I did?