Bellingham Clean Energy Task Force

Western Solar

INTEGRITY & CRAFTSMANSHIP

SIW

Solar Installers of Washington

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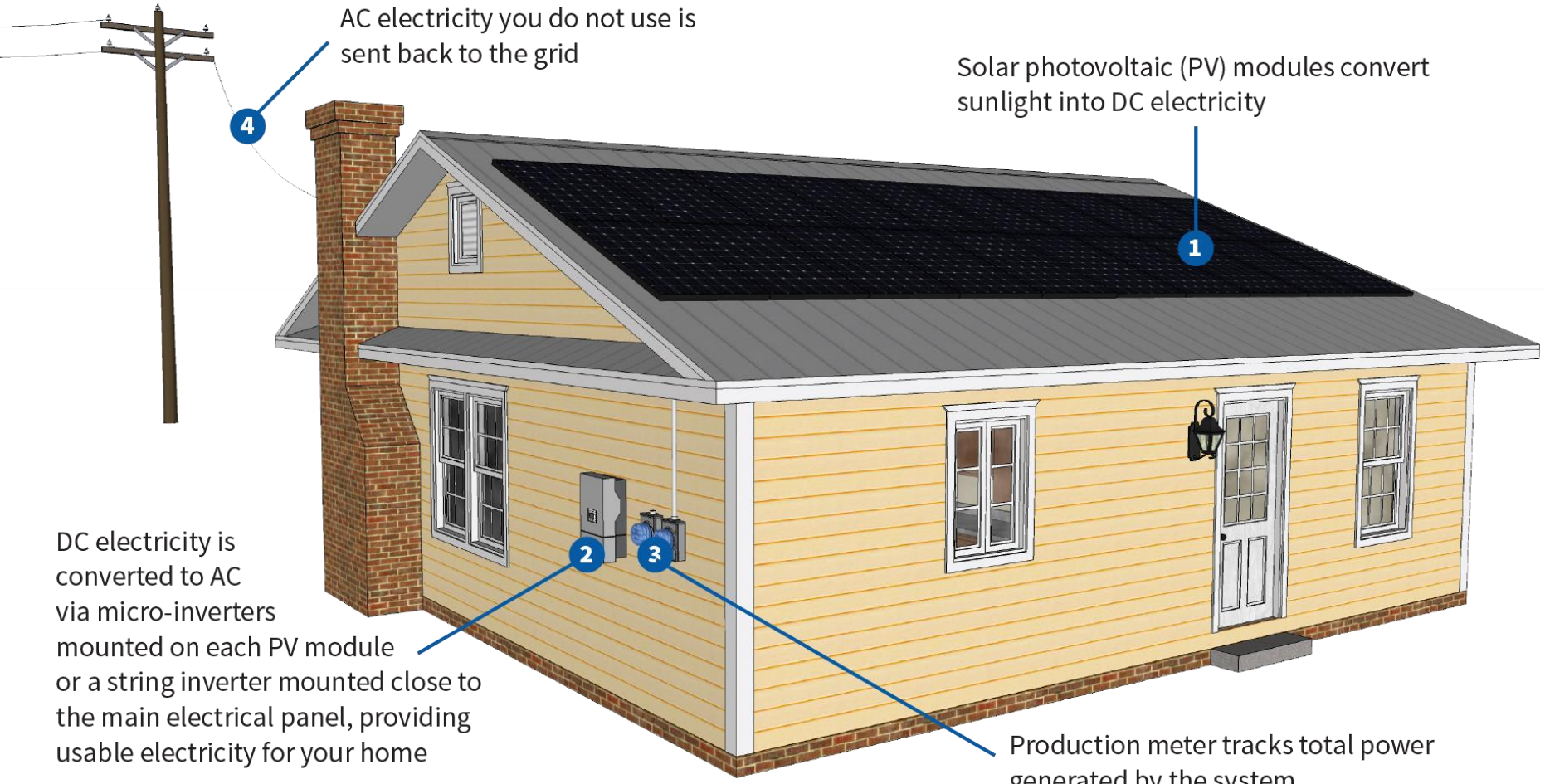
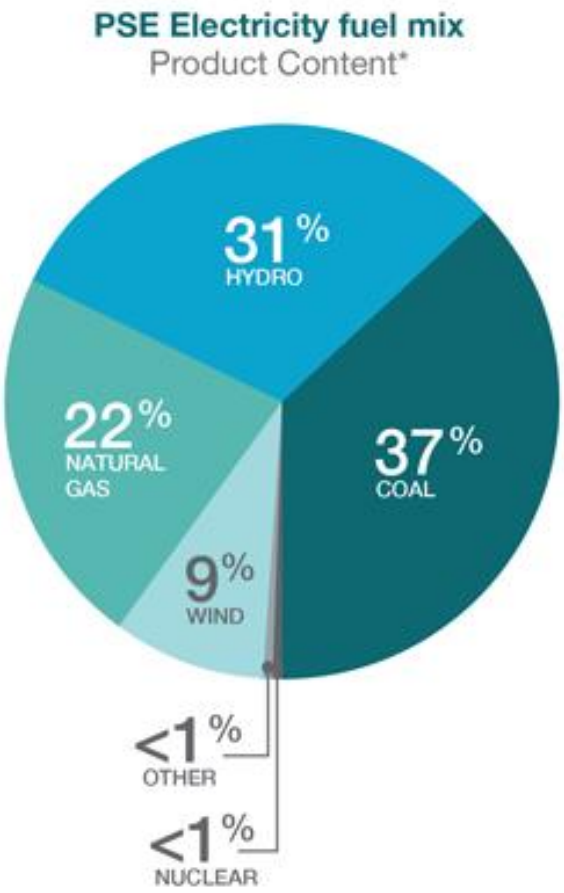
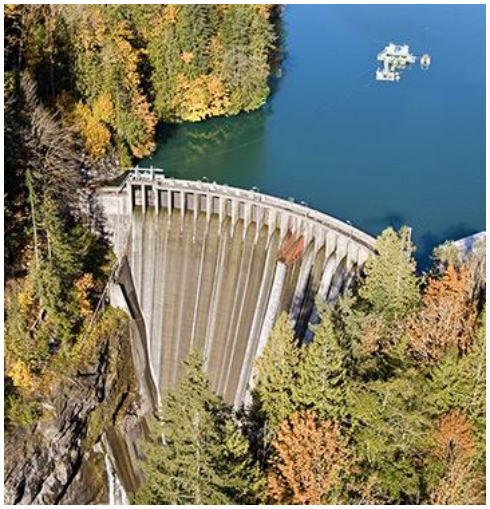
How Does Solar Work?

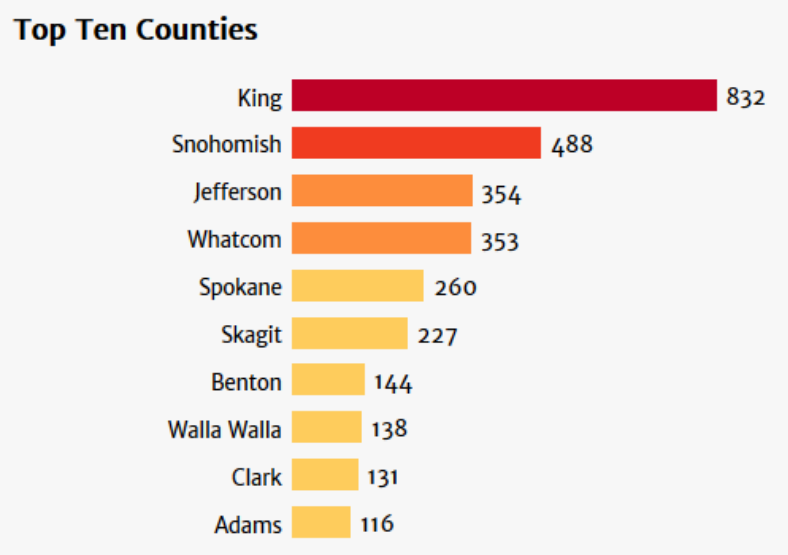


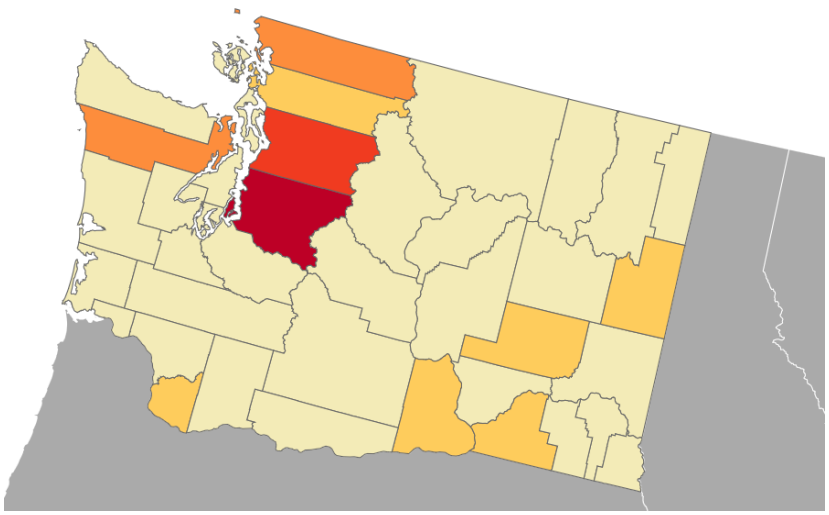
Do we want solar in Western Washington?





A Vibrant Clean Energy Economy





Washington

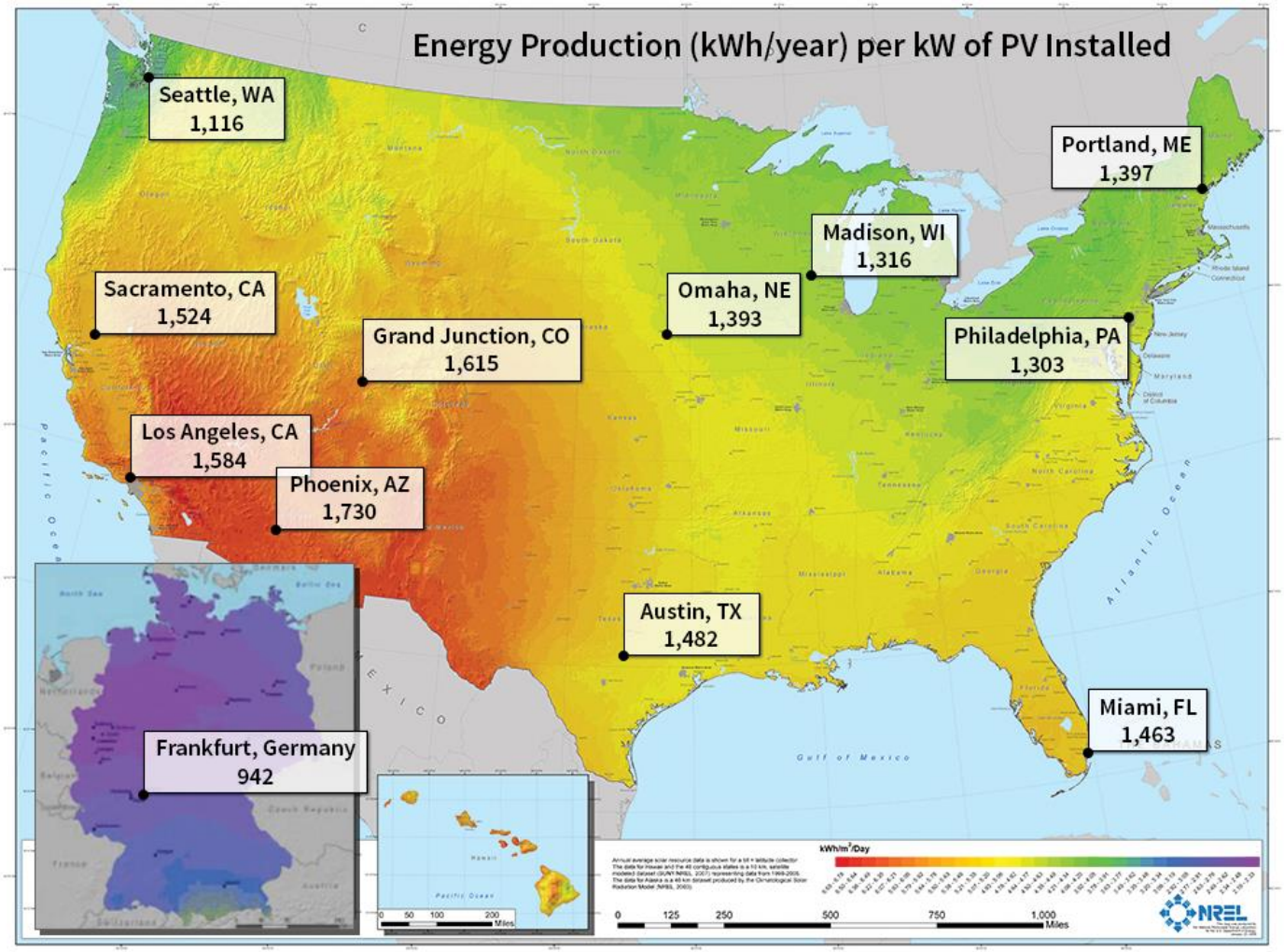
Washington Fact Sheet

		rank among states
3,433	Solar jobs	22/51
1,588	Installation jobs	23/51
618	Manufacturing jobs	16/51
264	Sales and distribution jobs	32/51
735	Project development jobs	12/51
228	Other solar jobs	20/51

46.3% Installation
18.0% Manufacturing
7.7% Sales and Distribution
21.4% Project Development
6.6% Other

Courtesy of The Solar Foundation

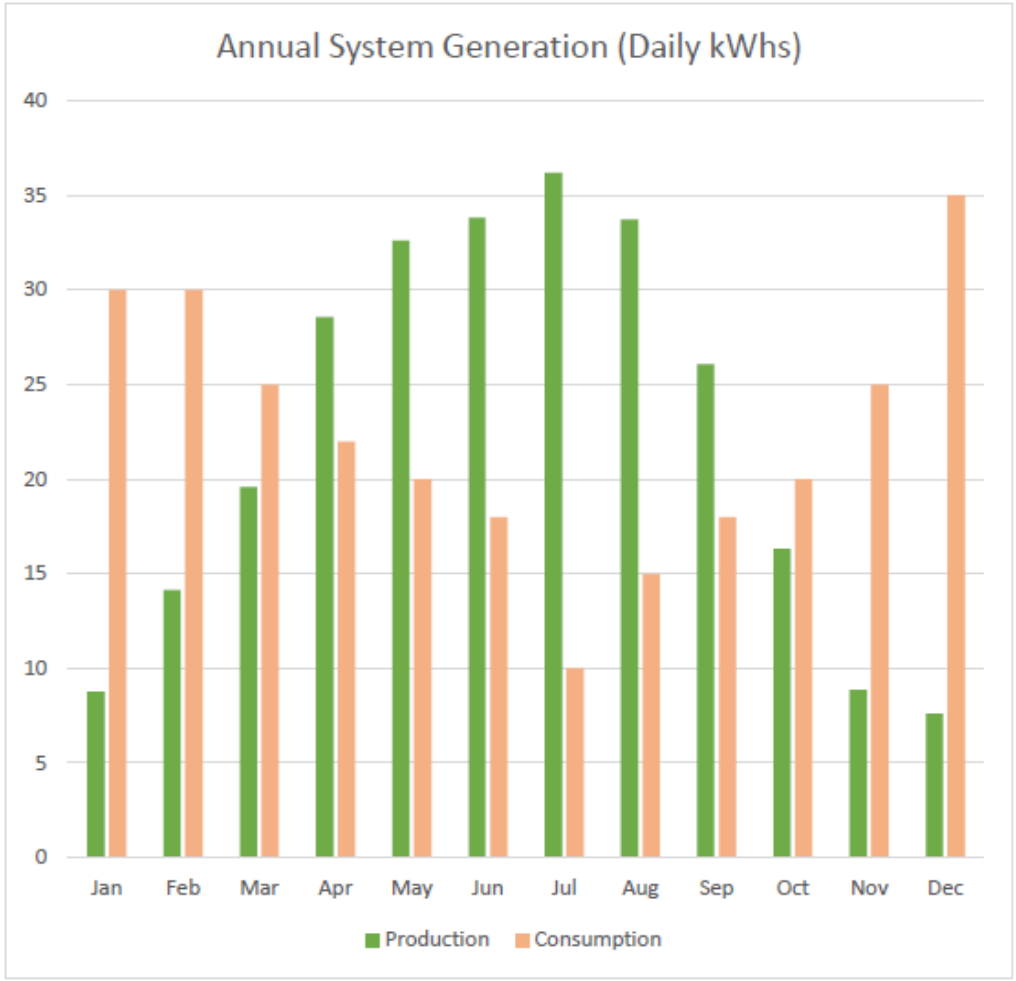
Solar Generating Capacity Comparison



Courtesy of NREL

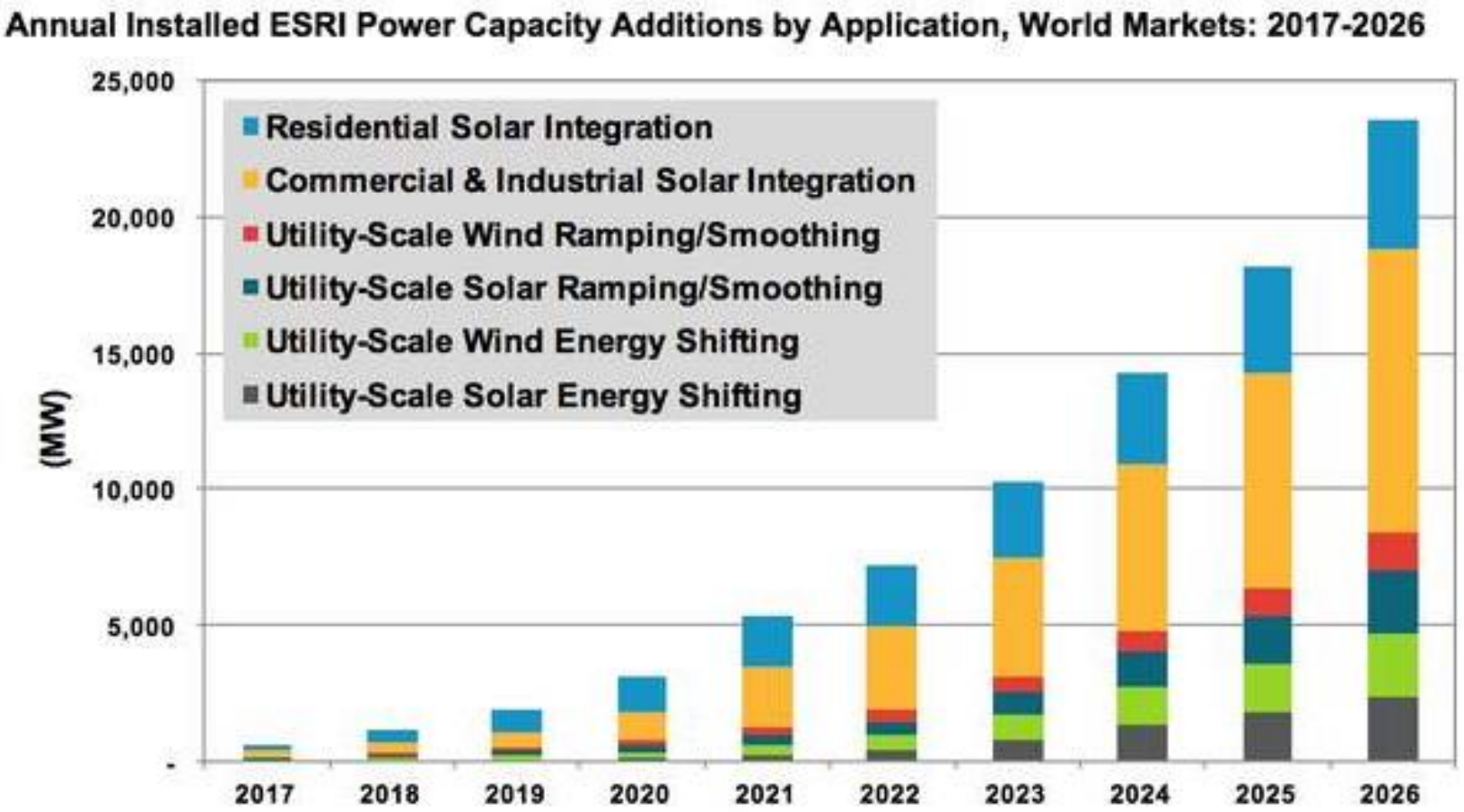
Seasonal Generating Capacity

Estimated System Benefits	
Annual kWh Produced	8,115
Annual kWh Consumed	8,135
Annual Electric Consumption Offset	99.8%
Annual lbs Carbon Offset	9,738
Annual equivalent gasoline offset (Gallons)	487
Annual Equivalent Trees/CO2 Sequestered	203



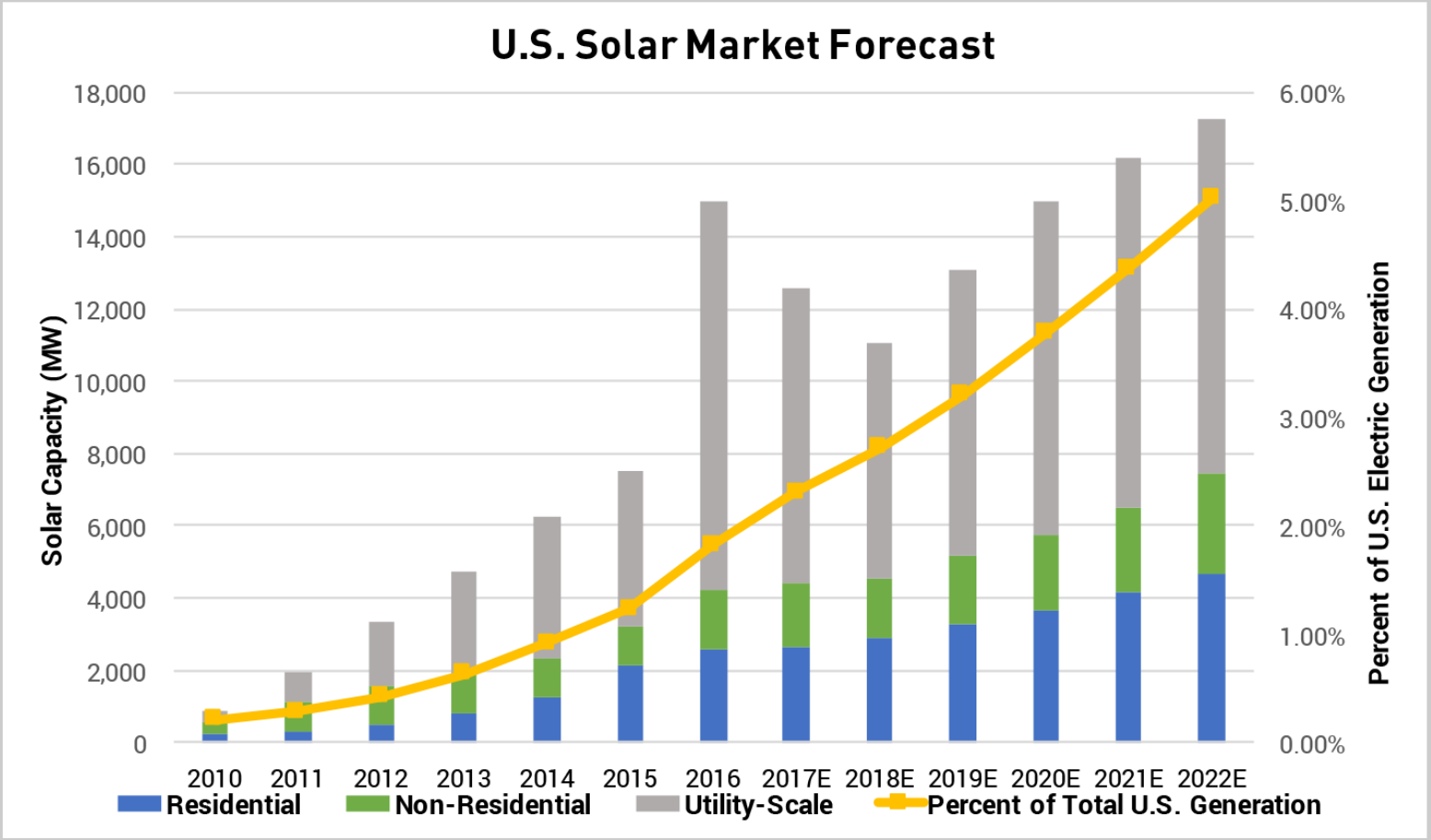
Estimated Monthly Production (in kWh/day)from typical 24 Panel (7.2kW) System in Western Washington

Solar Industry Growth Trends - Worldwide



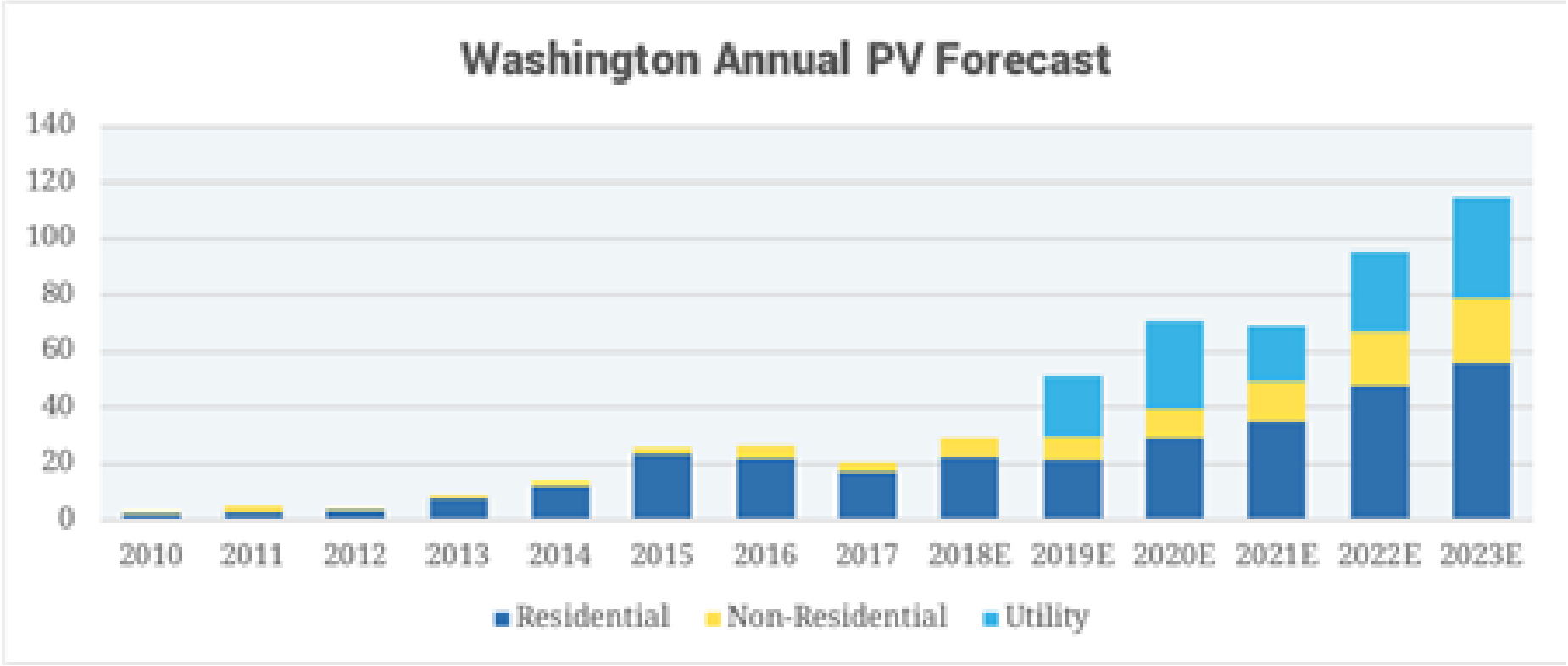
Source: Navigant Research

Solar Industry Growth Trends – US Market

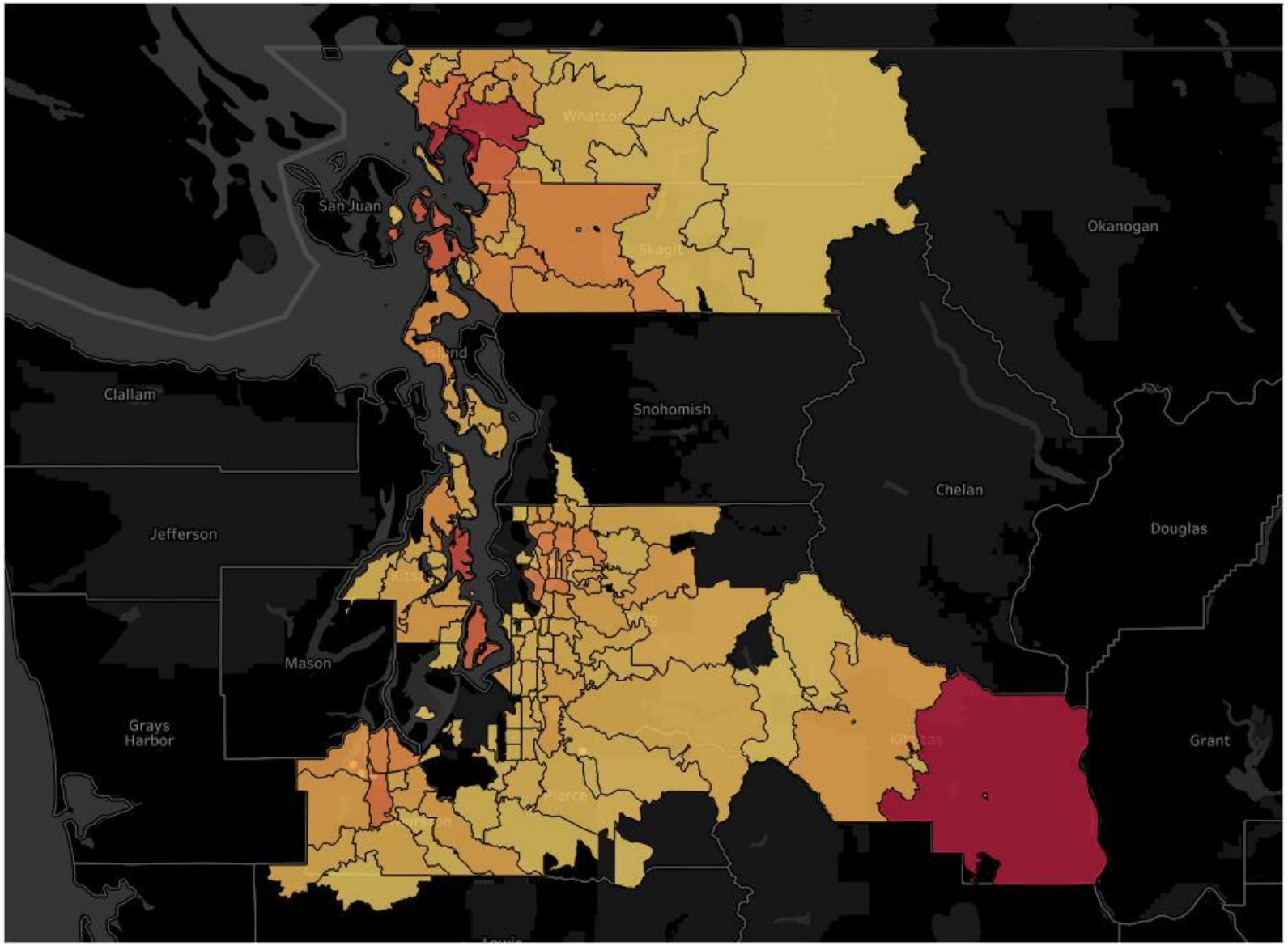


gtmresearch SEIA Solar Energy Industries Association®

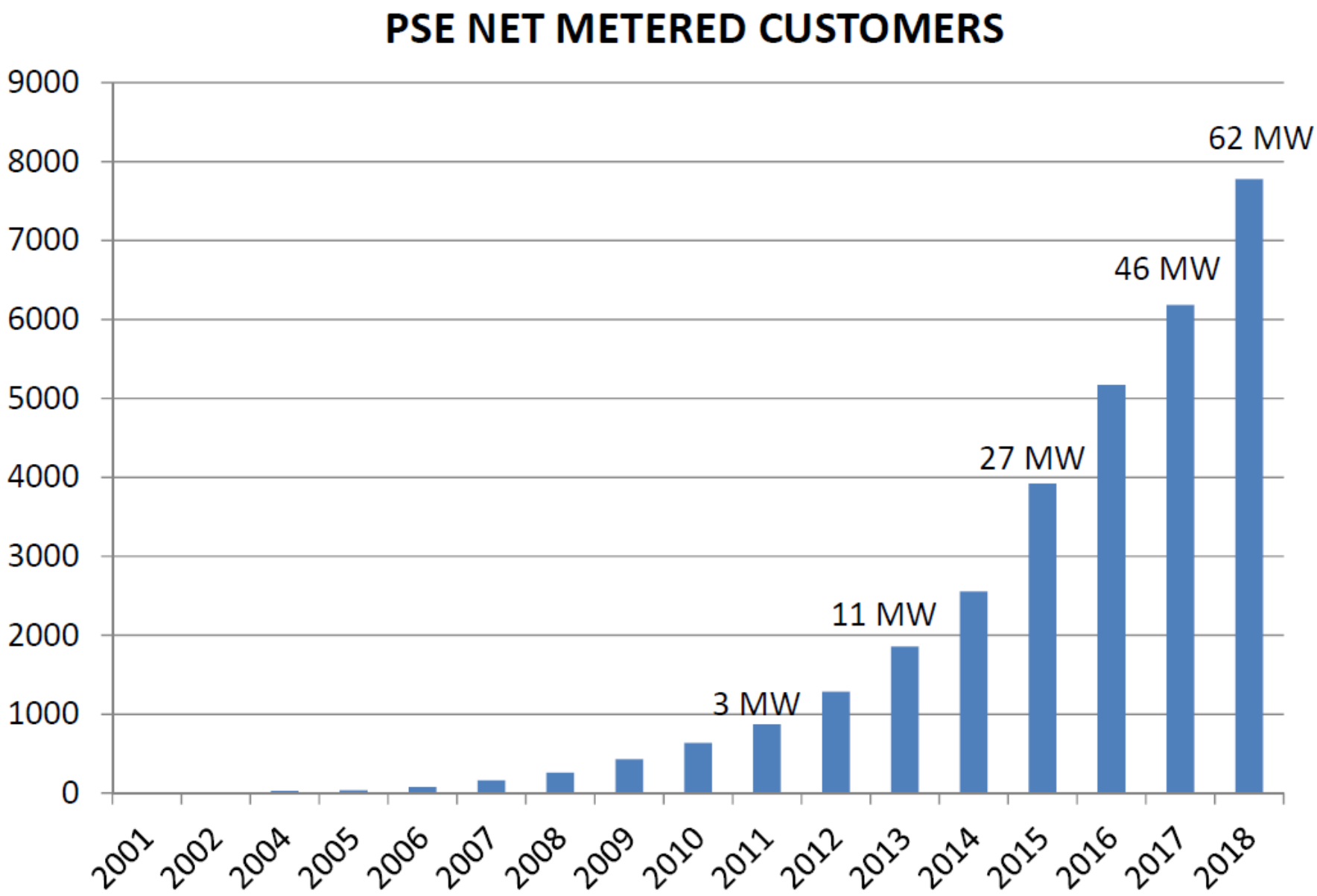
Solar Industry Growth Trends – WA Market



PSE Solar Customer Distribution

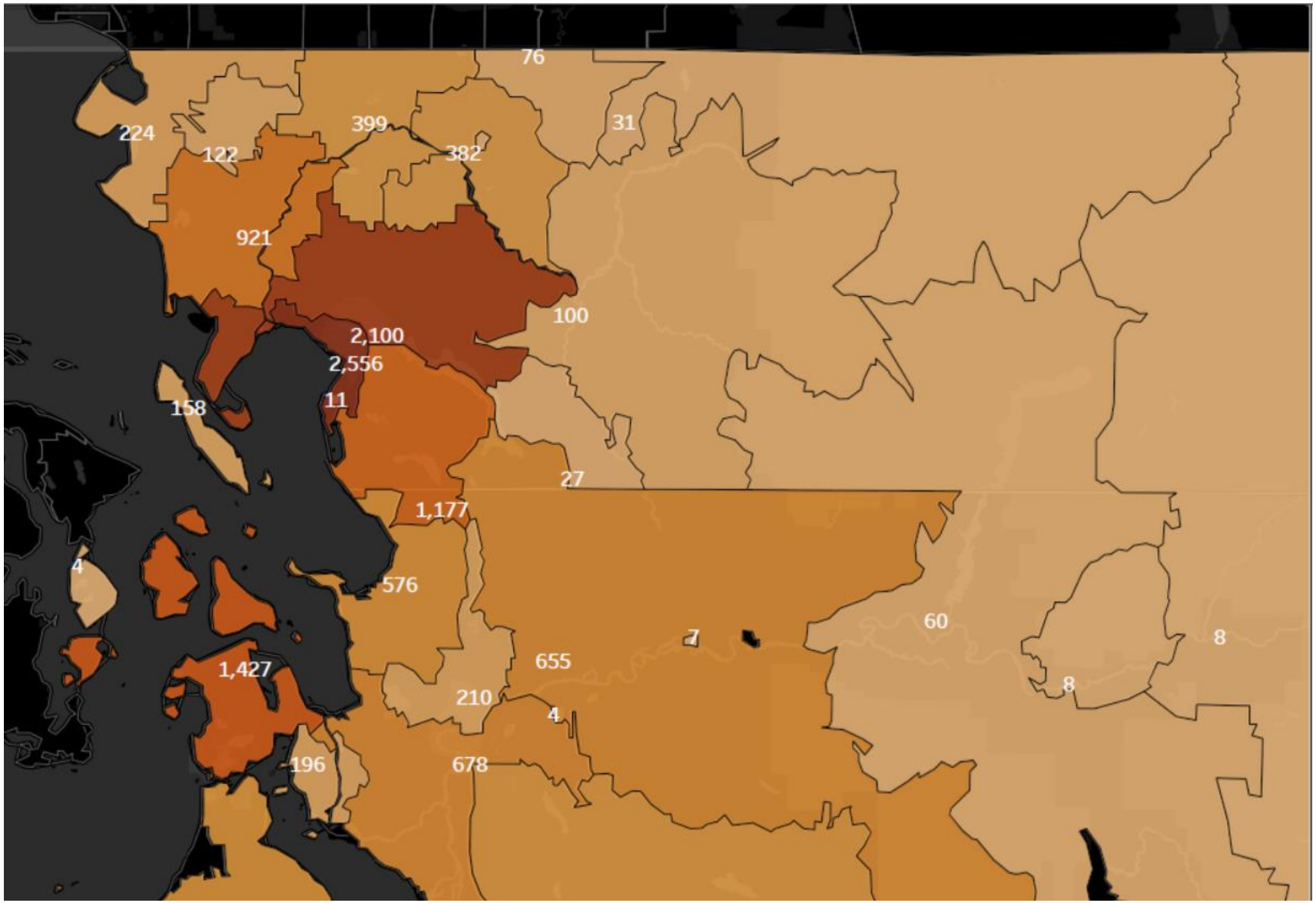


Courtesy of PSE



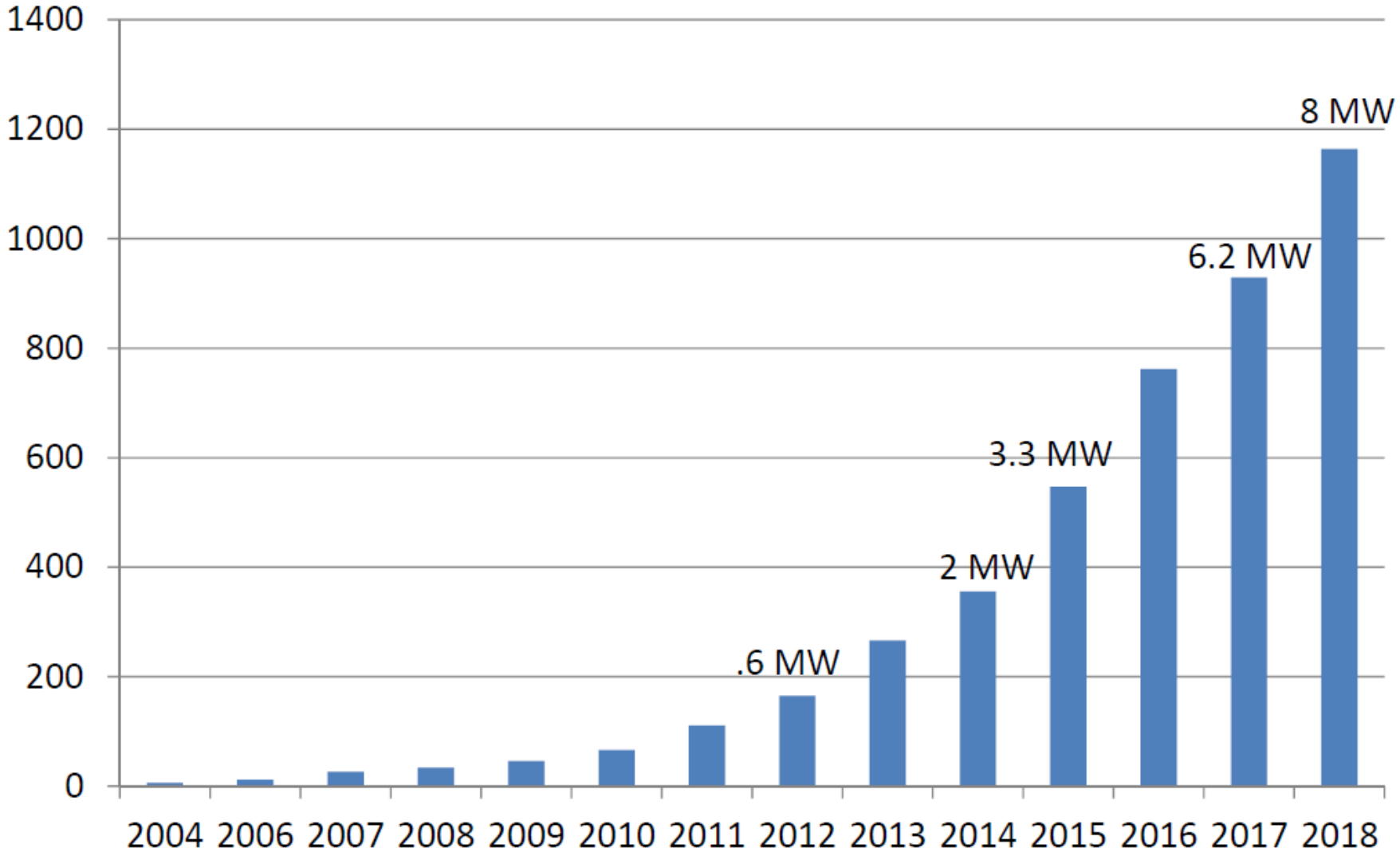
Courtesy of PSE

Whatcom/Skagit County Solar Customer Distribution



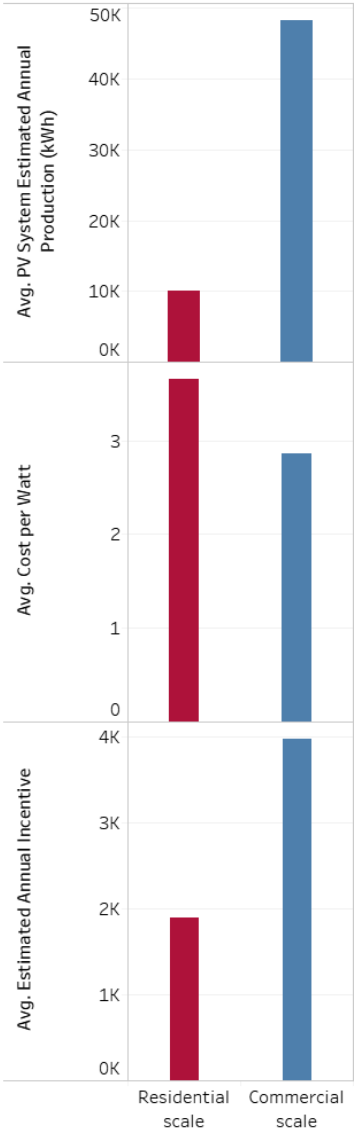
Courtesy of PSE

PSE Net Metered Customers in Bellingham



Courtesy of PSE

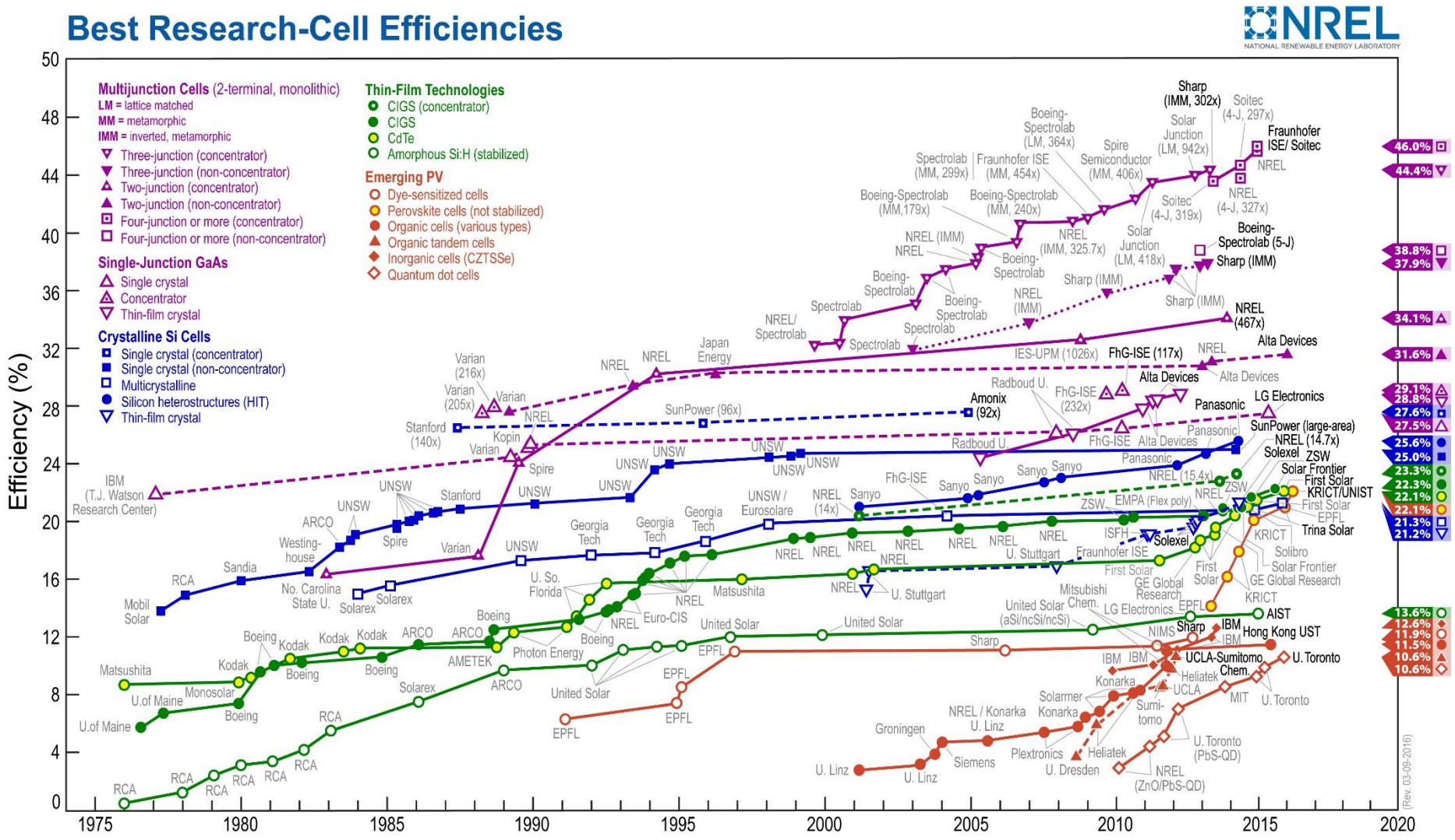
Average System Cost (Per Watt Installed)



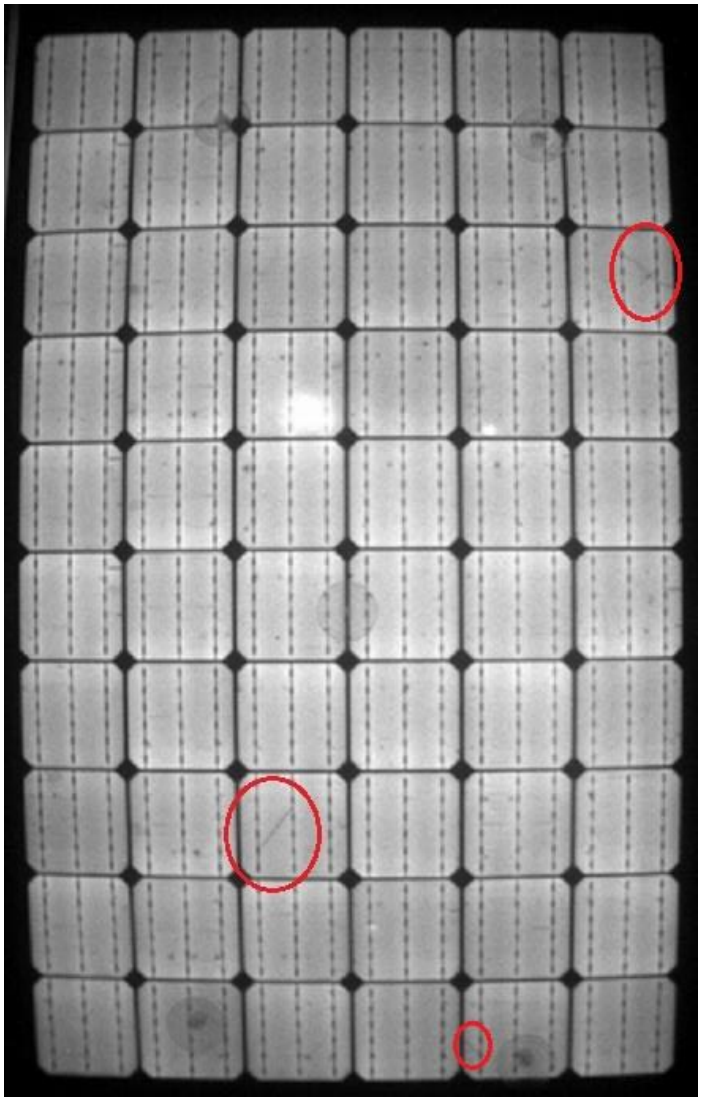
The discrepancy between Energy Sage and WSU may be caused by new installers that have recently entered the WA market, installed very high volumes of solar at 2x-3x market prices. Typical Installation cost of a residential 12kW PV array in Whatcom County range from $2.30-$2.65/watt.

Courtesy of Energy Sage & WSU Energy Program

Solar Module Efficiency



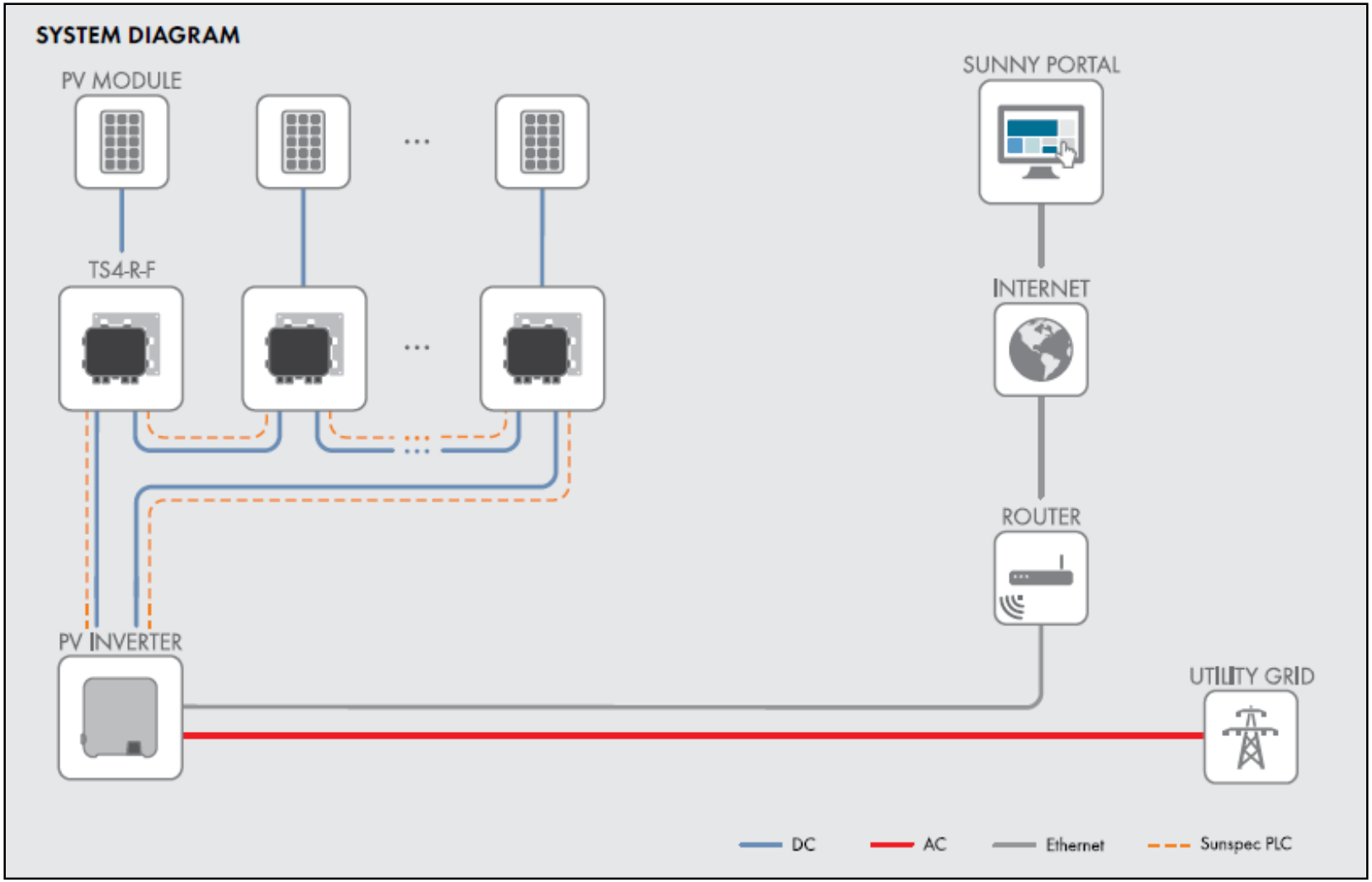
Solar Module Construction



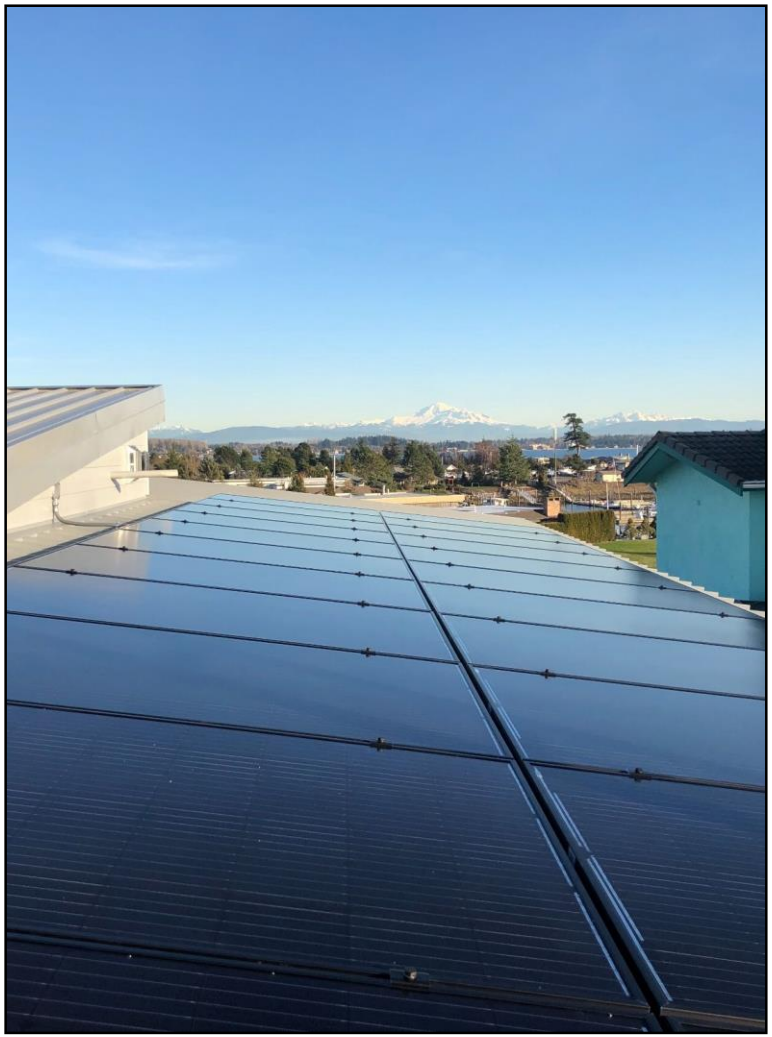
Microfractures can Exacerbate over time which will lead to premature module failure

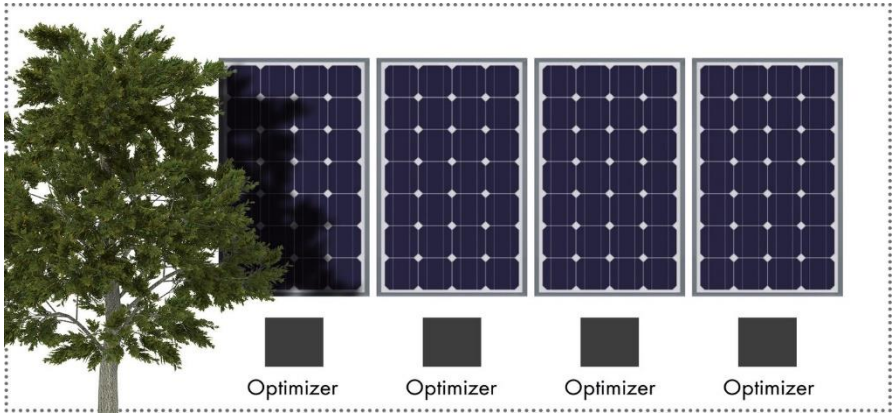
Module Level Rapid Shutdown Requirement

MLRS Requirement with NEC 2017 – Adopted in WA starting January 1 2019

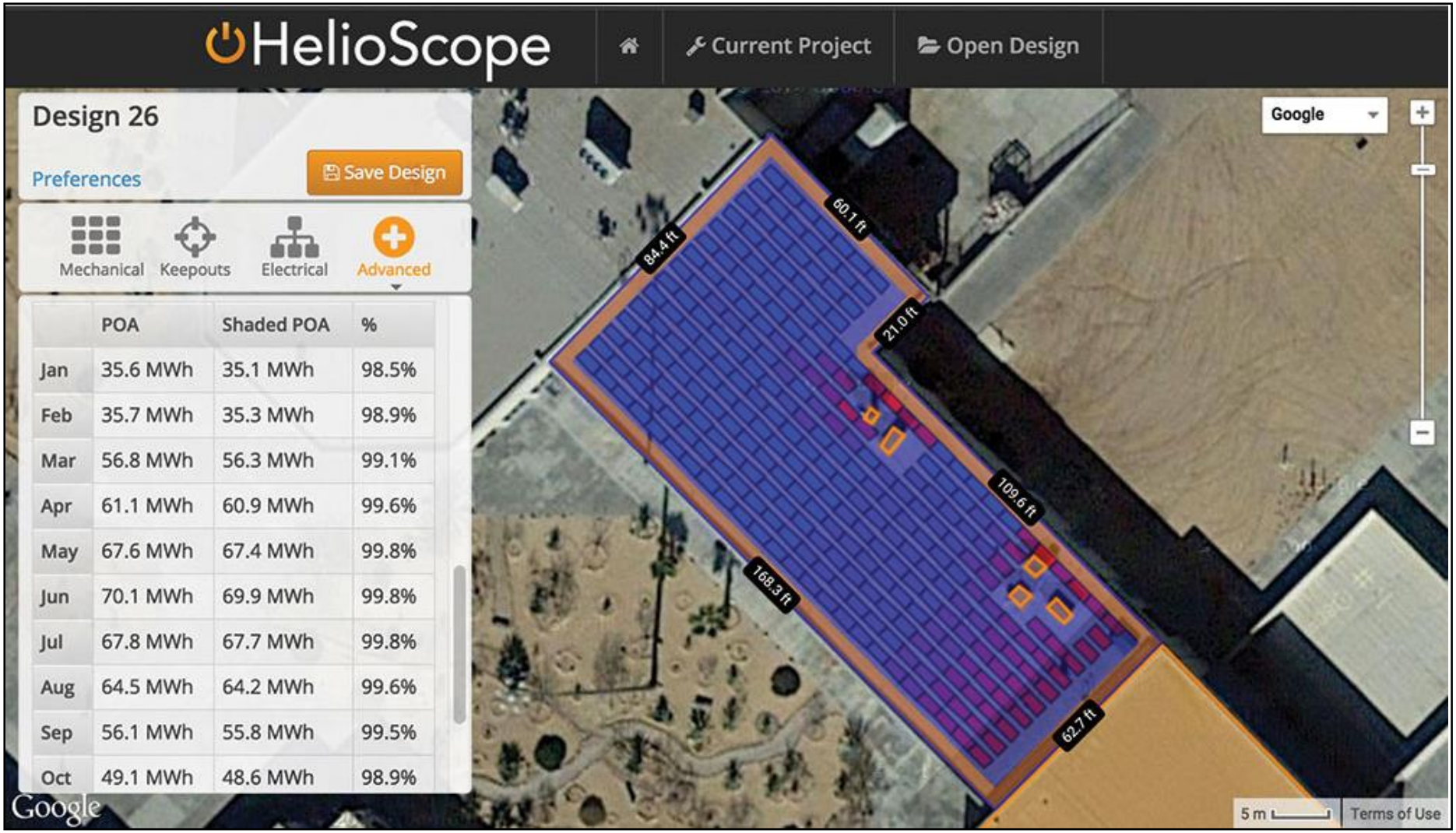


Module Level Rapid Shutdown Requirement





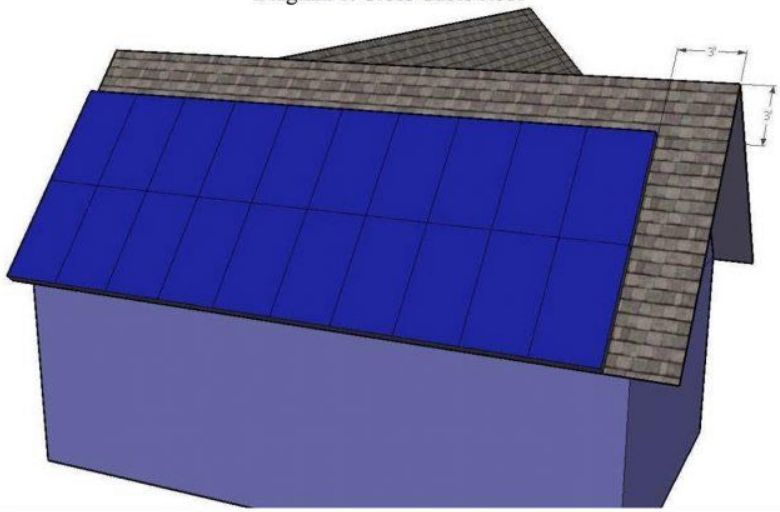
Site Assessment & Fire Setback Requirements



Courtesy of HelioScope

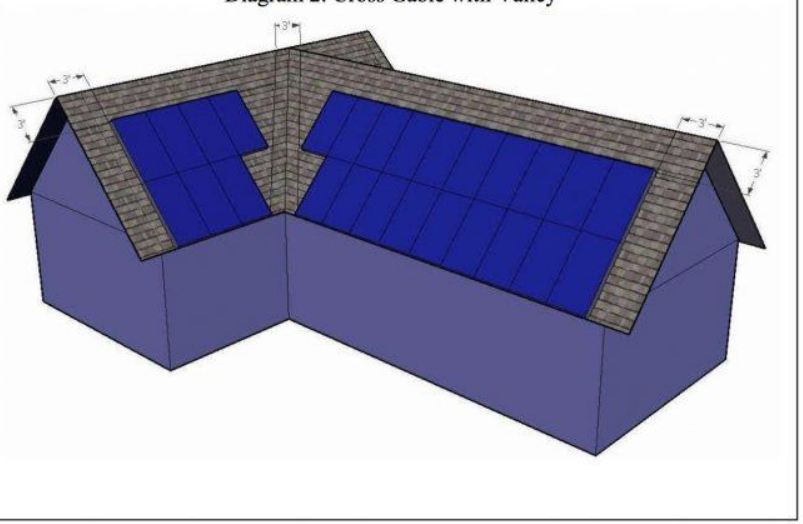
EXAMPLE 1

Diagram 1: Cross Gable Roof



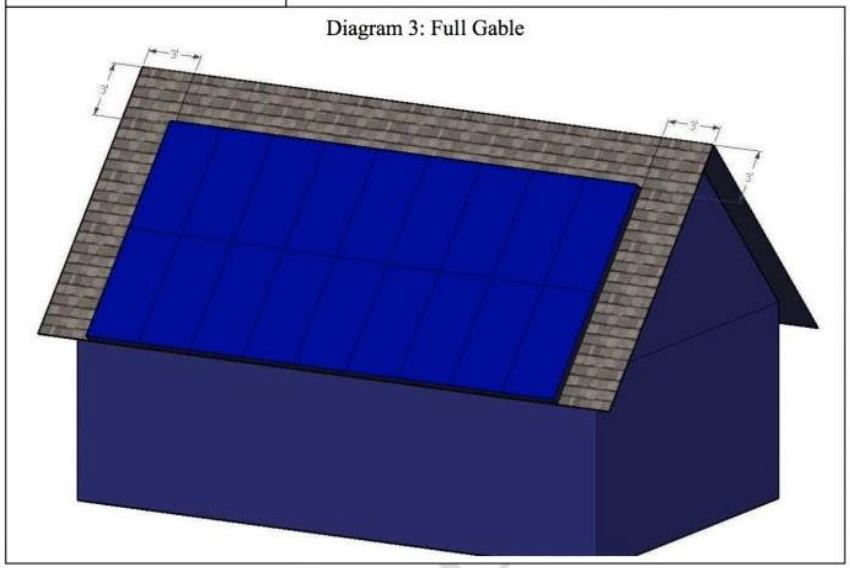
EXAMPLE 2

Diagram 2: Cross Gable with Valley



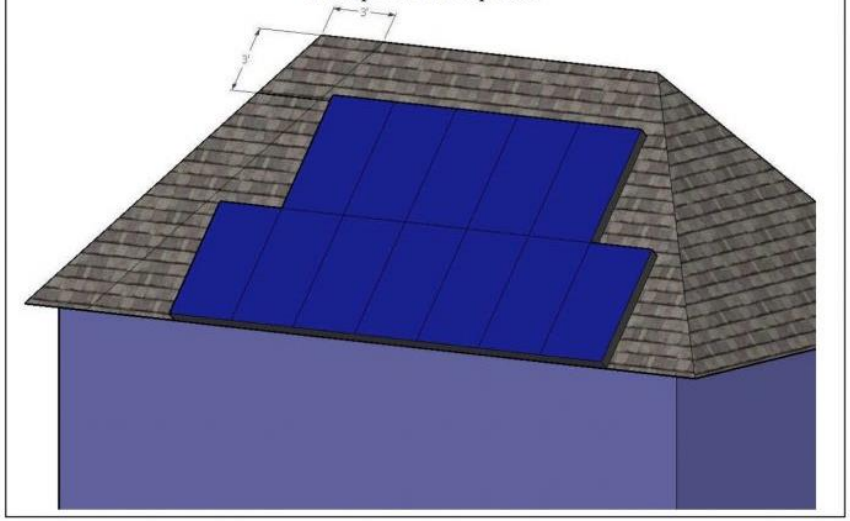
EXAMPLE 3

Diagram 3: Full Gable



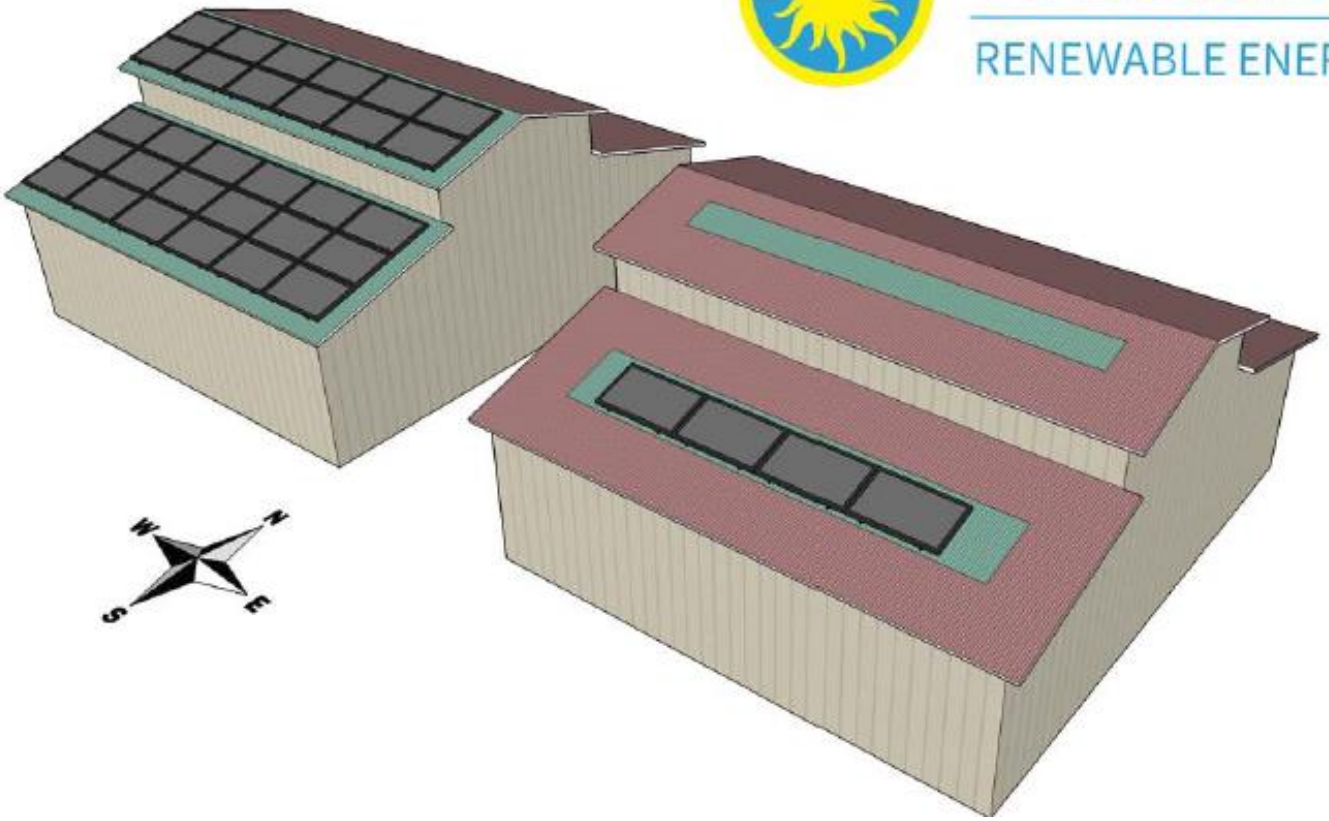
EXAMPLE 4

Example 4: Full Hip Roof



Current Commercial Firecode Setback requirements making
Commercial Solar on Small Whatcom County Farms virtually impossible

Western Solar
RENEWABLE ENERGY SOLUTIONS



Notes:
Exterior/Interior DC Conduit Runs to be labeled as:
"Photovoltaic Conductors"
Main Disconnect to be Identified as:
"Photovoltaic Power Source"

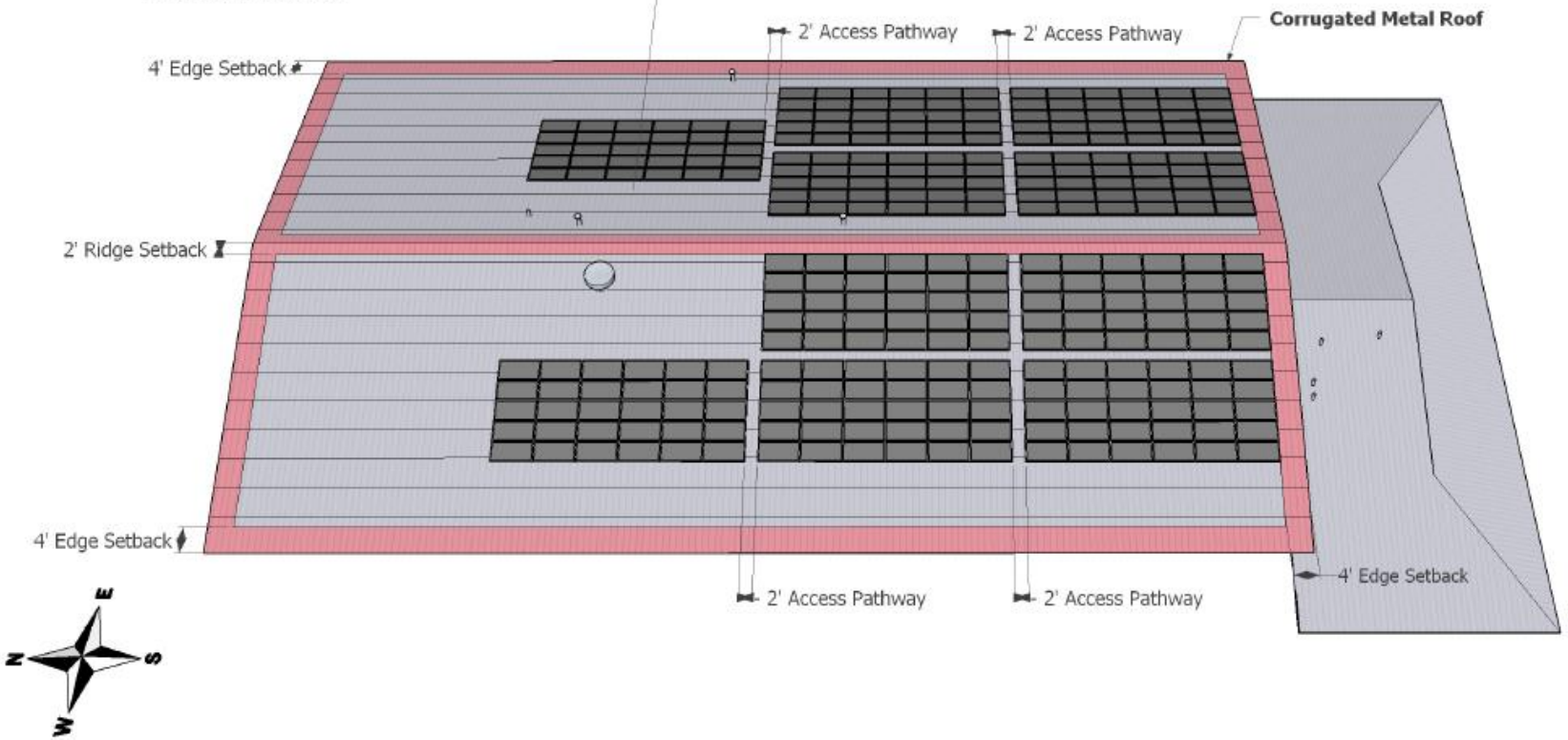
Design meets requirements of:
WAC 51-54A-0605
Section 605.1.1.1, 605.1.1.2

(300) Itek Energy SE, 360 Watt XL Photovoltaic Modules
Total System Size: 108,000 Watts DC, 108 kWs
Vmp=38.94 V, Imp=9.25 A, Voc=47.87 V, Isc=9.62 A
Module Dimensions: 78.46" x 39.41" x 1.57"

Installed per Manufacturer Recommendations
on roof of residence using flushmount Snap N Rack
Mounting System installed at 48" on center,
into premanufactured trusses at 24" o.c.

Meets all City of Bellingham Structural Permitting Requirements
49 lbs per solar module x 300 modules = 14,700 lbs
21.47 sqft per solar module x 300 modules = 6,441 sqft
14,700 lbs / 6,441 sqft = 2.38 lbs/sqft.

itek XL Modules



Community Solar in Washington State

- **Barriers to success in Washington**
  - 30% tax Credit applies only to “passive income”
  - Virtual Net Metering not available in Washington
  - Loss of Production Incentive Funding
  - Community Solar Administrators are hard to find
  - Investors in community solar are hard/expensive to find

Financial Incentives – Primary (available to all)

- **30% Federal Tax Credit**
  - Stays at full 30% through the end of 2019
  - 26% for systems installed in 2020
  - 22% for systems installed in 2021
  - 10% after 2021 for commercial solar
- **Net Metering**
  - Sen Palumbo NEM – SB5223-S
    - Would Establish NEM as requirement for all utilities up to 4% of peak load (1996)
    - Working with stakeholders to determine what comes after 4%
  - Current limit is 100kW AC for Net Metered systems
  - Customer is credited for all power sent back to the utility (bank kWhs)

Financial Incentives – Secondary (available to some)

- **USDA REAP Grant**
  - Grants up to 25% of total Cost
  - $2,500 minimum - $500,000 Maximum Grant
  - Must be classified as Rural Small Business by USDA
  - Applicant must provide at least 75% of the project cost if applying for grant only
  - Projects Larger than $200,000 require a technical report
- **USDA REAP Loan**
  - Loans up to 75% of total Cost
  - $5,000-$25 Million Loan Amount
  - Up to 85% Loan Guarantee
  - Maximum Term of 15 years
- **100% Bonus Depreciation – Commercial Only**
  - Must be placed in service before Jan. 1, 2023
  - Typical Cash Value between 18%-25% of total cost

Legislative Outlook

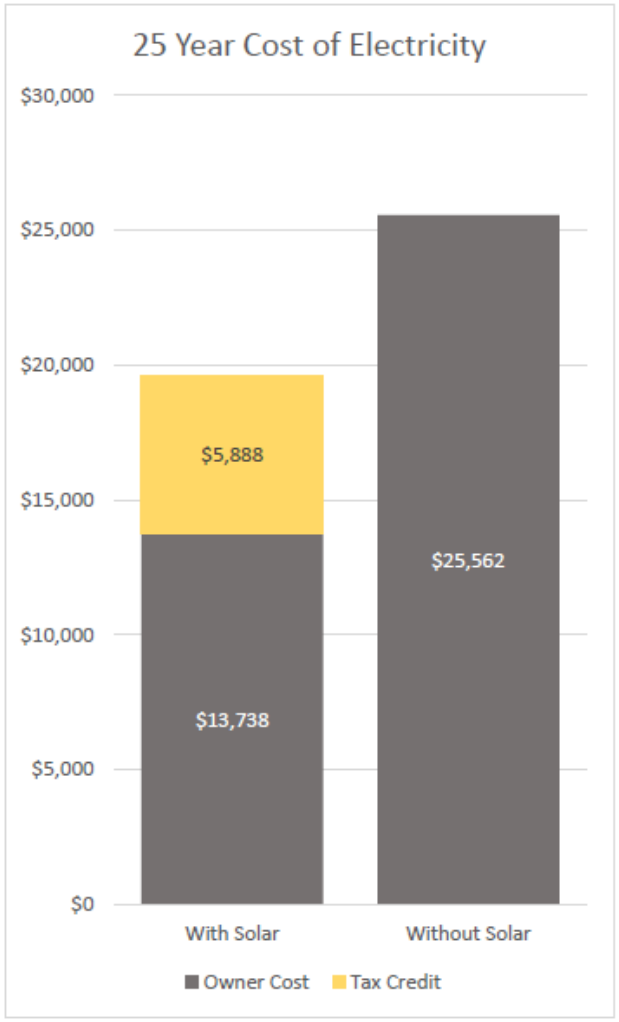
- **"Legacy" Solar Incentive Program**
  - Rate frozen at $.504/kWh for customers with fully Made in WA Equipment
  - Incentives paid until June 30, 2020
  - After June 30, 2020 no more incentives will be paid for "legacy" systems

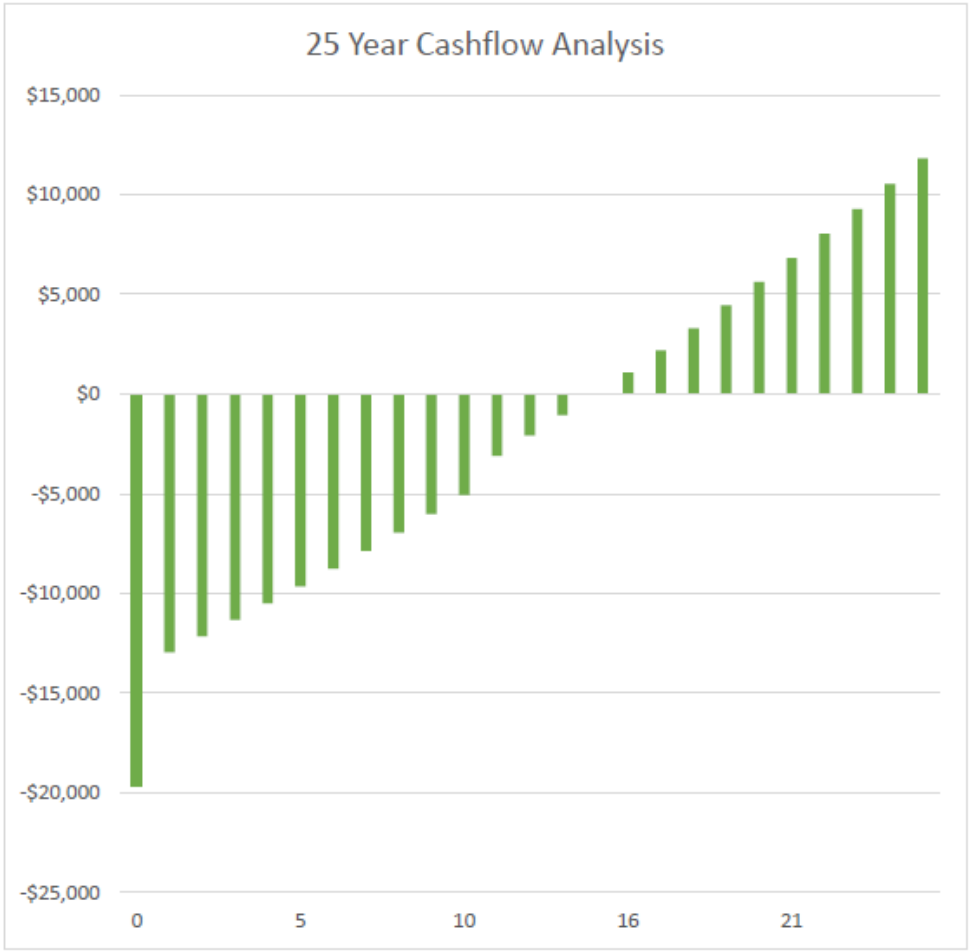
- **"Legacy 2" Solar Incentive Program**
  - Customer receives payment of $0.18/kWh annually for 8 years or until 50% of system cost is recouped. Rate is Locked in for the duration of the program. Rate sunsets over time for new customers:
  - SIW is considering alternatives to this incentive program as the Statewide funding limit to the program has been reached.
  - The most likely replacement to this incentive program will look like an upfront rebate ($200/kW installed) coupled with a sales tax exemption.

	Residential (12kW or smaller)		Commercial (Greater than 12kW)	
	Made In WA	Non-Made in WA	Made In WA	Non-Made in WA
July 1 2018 - June 30 2019	$.18/kWh	$.14/kWh	$.08/kWh	$.04/kWh
July 1 2019 - June 30 2020	$.15/kWh	$.12/kWh	$.05/kWh	$.03/kWh
July 1 2020 - June 30 2021	$.12/kWh	$.10/kWh	$.04/kWh	$.02/kWh

System Pricing/Cashflow Analysis

Cost of Power over 25 Years





Assumes 3% annual inflation of electricity cost. Pricing assumes standard 5.4kW (18 Panel) installation with Southern unobstructed resource.

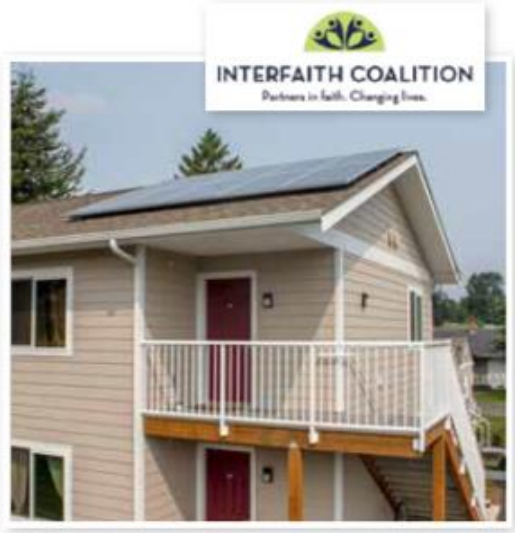
The Western Solar Initiative

WESTERN SOLAR IS PROUD TO SUPPORT THESE COMMUNITY PROGRAMS

Here at Western Solar, we feel that it is extremely important to give back to the communities we serve. Through sponsorships, community engagement, and education we support the efforts of these, as well as many other, local non-profits. We believe that the impact that solar can have on a non-profit's operating budget or a low-income family's ability to offset their monthly power bill cannot be overlooked.

LYDIA PLACE'S BAKER PLACE CAMPUS

Western Solar, Itek Energy, and Aslan Brewing Company collaborated to raise funds to donate a system to Lydia Place's new Baker Place property. What started as an idea over beers resulted in the creation of Aslan's Summer Solar Ale, with 5% of sales proceeds going to support the Lydia Place project, and a series of workshops open to the public to share about Lydia Place's mission and the impact that a donated solar system would have on their work in our community.



BELLINGHAM FOOD BANK

Western Solar was selected as one of the two installers to particpate in Sustainable Connections' Solarize Whatcom campaign, a series of educational workshops designed to inform attendees about how solar works, available incentives, and what sites are suitable, along with allowing for lower system prices for those participating in the program. For each system installed via the campaign, one solar panel was donated. A total of 48 panels were installed by the Western Solar crew on the food bank.

Photo courtesty of Itek Energy

Photo courtesty of Habitat for Humanity

Questions?

Markus Virta, Director of Business Development

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