Saving Money and the Planet with Solar Panels

Washington Interfaith Power & Light
EARTH MINISTRY

Earth Ministry/WAIPL works within the unceded territories of Northwest Native nations. Our office is on the traditional land of the first people of Seattle, the Duwamish People past, present, and future.

A land acknowledgement is one way to resist the erasure of Indigenous histories as well as honor tribes and the land itself.

Guest SPEAKERS

Richard Hartung

Stu Frothingham

Roy Foster

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Session AGENDA

- Solar overview
- Solar benefits and costs
- Solar system information
- Financing
- Insights from Installers
- Q&A session

Renewable Energy

Types of renewables

- Solar
- Wind
- Geothermal
- Grid: Biomass, ocean, hydro, nuclear

Solar and more

- Solar panels
- Batteries

Community Solar

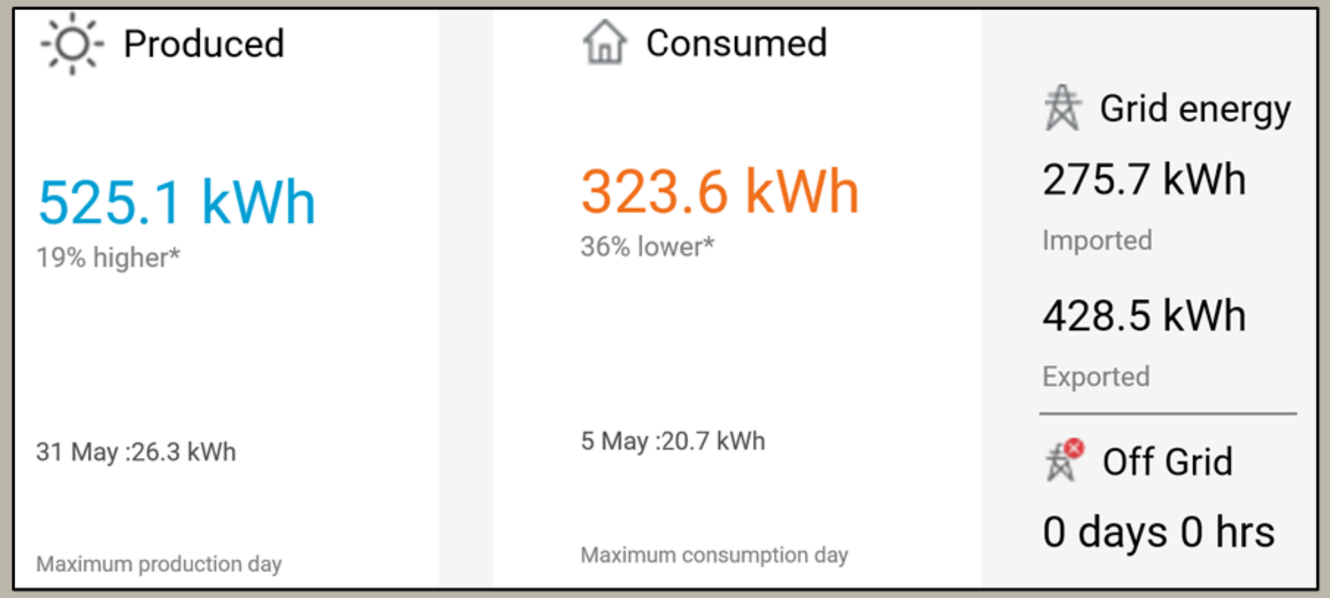
Why Solar - Financially

Benefits of Solar

- Reduced long-term electricity costs
- Reduced impact from increasingly frequent power outages
- Building value increases an average of 4%
- Potential higher rent from tenants, who often prefer green buildings

Costs of Solar

- Solar system installation
- Solar system maintenance
- Solar energy storage (optional)



Solar Energy & Creation Care

Non-residential buildings cause about 16% of US greenhouse gas emissions

- 22% of WA energy from gas and coal

25% of low-income households are energy-cost burdened (WA DoC)

Average WA electricity outage 8.8 hours/yr

Solar Energy & Creation Care

Reduction in fossil fuel greenhouse gasses

- Panels can offset production & disposal emissions in 2-3 years

Reduced construction of new infrastructure such as power plants and transmission lines

- Demand increase of 30%+ - PNUCC

Reduction in land degradation

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Other Benefits for Communities

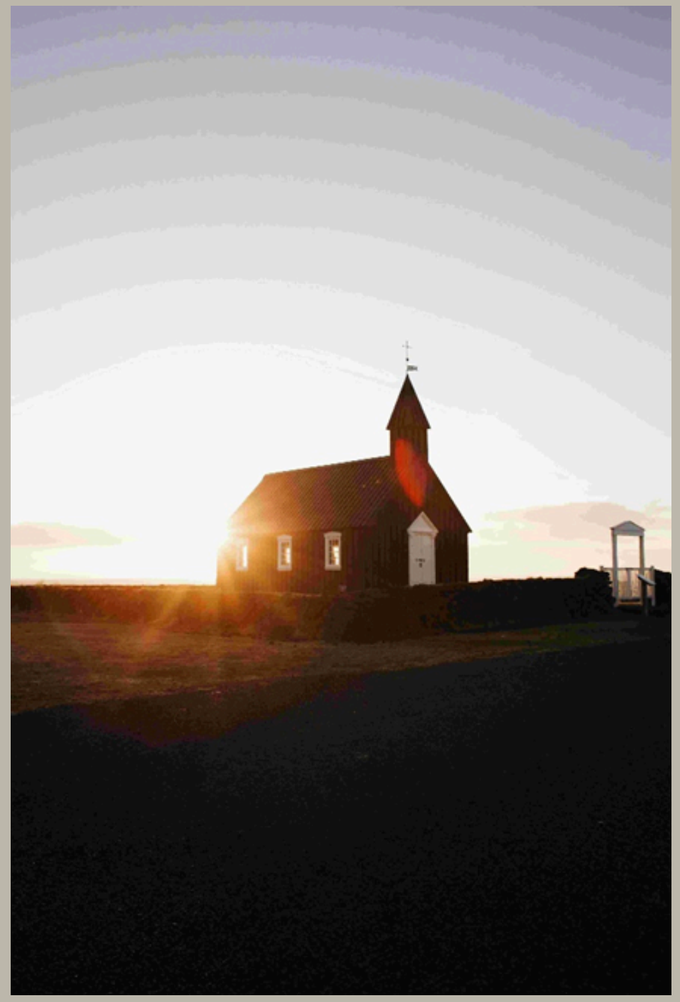
Demonstrate action for Creation Care and environmental stewardship

Reduced electricity expenses allow funds to be used for other purposes

Communities with solar can serve as resilience hubs for their local community

Excess production can power homes in the community

Outreach to young adults who want to be part of a faith or spiritual community that's making a difference



Solar Panel Basics

Suitability – sunshine and roof

- Solar panels are durable and can last about 25 years

Energy needs and number of panels

Installation cost

- Washington breakeven averages 16 years

Considerations

- US 30% federal tax credit is available for “houses of worship”
- No panel sales tax in Washington

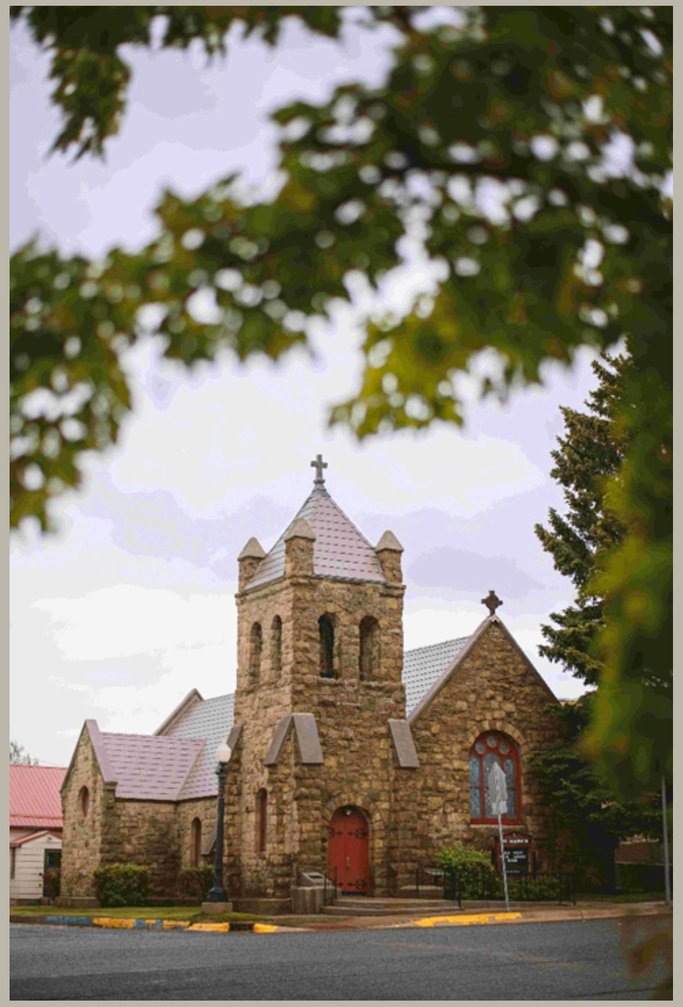
Preparation for Installation

Energy usage reduction

- The number of panels and cost depend on expected KwH usage
- Reducing energy usage can reduce costs
- Opportunities include reducing heat & cooling, hot water, and lighting

Roof

- Solar panels last about 25 years
- Reinstallation is costly so consider roof condition and longevity



Solar Installation Overview

Identify potential installers and ask for proposals

- https://www.solarwa.org/consumerresources

Review proposals and ask questions

- Methodology for the quote
- Sufficiency of electricity supply
- Domestic or international panels
- Inverters

Select the installer

Manage the installation

Maintain and manage solar panels

Solar Installation Considerations

Installer proposals

Contact reputable installers

Request multiple proposals

Review proposals thoroughly

- Read the contract details
- Look for high or unusual costs

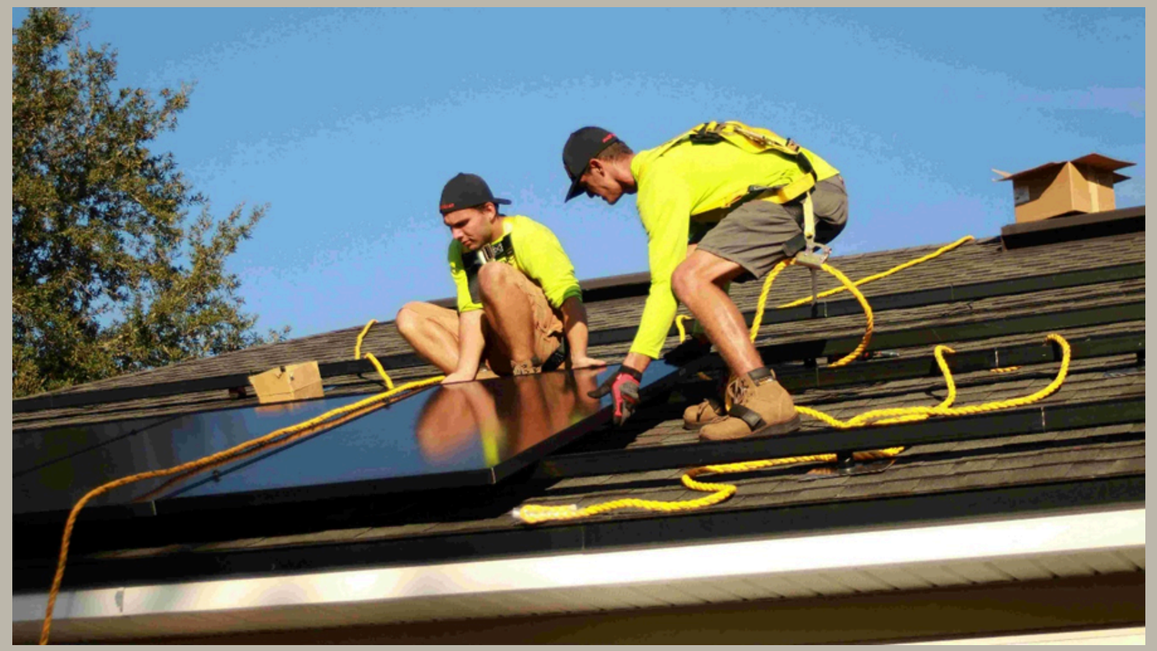
Financing

- Loans
- Grants

Installation management

Usage

- Dashboards to track & manage solar



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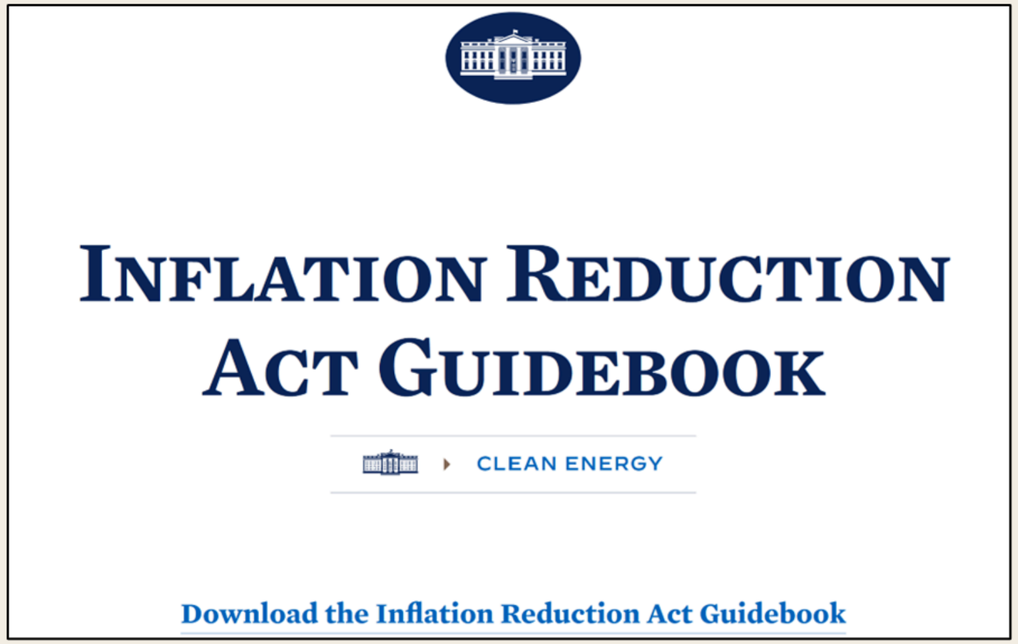
Paying for Solar Installation

The IRA provides payment to communities that build qualifying clean energy projects

- If a church installs a $100,000 solar array, it could claim a 30% tax credit and receive a $30,000 payment
- Bonus credits of 50% if the congregation installs solar at a site contaminated by pollution and ensures that half the electricity serves low-income households

Funding: cash,loan, and grants



Source:
https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/

Loan Overview

Financial institutions

- A loan from a bank, credit union, solar installer or other lender

Lease

- Lease solar panels and pay a fixed monthly amount
- Lower electricity bills

Power Purchase Agreement (PPA)

- A 3rd-party developer or solar provider installs, owns, and maintains solar
- Provider sells energy at a fixed rate
- The PPA provider manages repairs

No tax credit for a lease or PPA

Solar Energy Storage

Solar & wind energy is not always produced when it is needed most

Residential solar paired with a battery provides power & self-sufficiency

Solar power system & inverters deliver power, including during outages, with a switch energy from DC to AC and back

Battery installation can cost $12K-$22K+

New solutions are on the way, replacing stand-alone lithium batteries

- EV charging
- Vanadium, potassium, and other batteries

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Alternatives for Solar

Residential building solar installation

- Apartments, condos & offices
- Discussions with landlords

Buy renewable energy from the utility

- Green power options, at a fee

Community solar

Invest in solar

- Stocks
- Entrepreneurs
- Loans

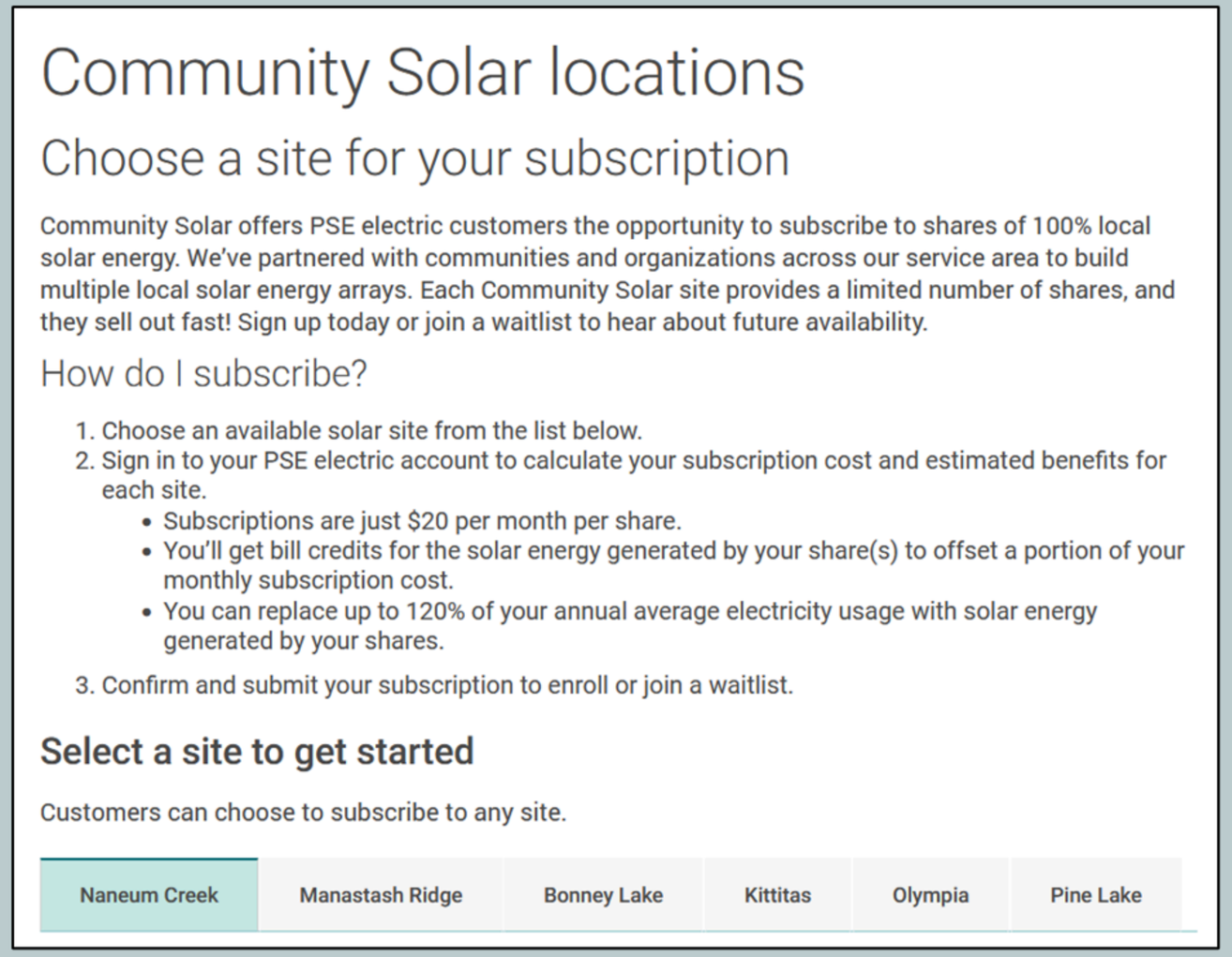
Community Solar

Community homeowners share power from a large solar array

Recent examples in Washington (2022)

- Bonney Lake (near Puyallup)
- Thurgood Marshall School (Olympia)

Previously at Phinney Ridge



Community Solar locations

Choose a site for your subscription

Community Solar offers PSE electric customers the opportunity to subscribe to shares of 100% local solar energy. We've partnered with communities and organizations across our service area to build multiple local solar energy arrays. Each Community Solar site provides a limited number of shares, and they sell out fast! Sign up today or join a waitlist to hear about future availability.

How do I subscribe?

1. Choose an available solar site from the list below.
2. Sign in to your PSE electric account to calculate your subscription cost and estimated benefits for each site.
   - Subscriptions are just $20 per month per share.
   - You'll get bill credits for the solar energy generated by your share(s) to offset a portion of your monthly subscription cost.
   - You can replace up to 120% of your annual average electricity usage with solar energy generated by your shares.
3. Confirm and submit your subscription to enroll or join a waitlist.

Select a site to get started

Customers can choose to subscribe to any site.

Naneum Creek | Manastash Ridge | Bonney Lake | Kittitas | Olympia | Pine Lake

Invest in Renewable Energy

Stocks and ETFs

- Example: Enphase

Startups

- Example: Vroom Solar on StartEngine or PowerPanel on WeFunder

Loans

- Example: Re-Volv

Solar Design Considerations

Basis for Design = Building's Energy Usage.

Site Energy Production Considerations.

- Shading, Roof Orientation, and Tilt.

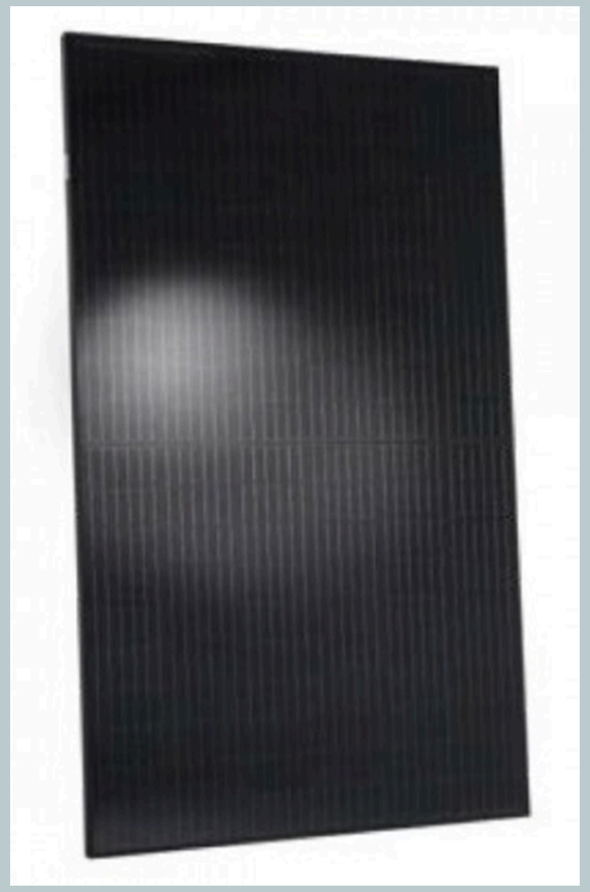
Roof Considerations: Materials & Flat vs. Pitched

- Easy to mount solar on – Standing Seam Metal & Comp. Shingle
- Possible – Single Ply Membrane, PVC, and Torch Down.
- Avoid – Rubber, Interlock Metal, Cement/Spanish Tile, Cedar Shake
- Flat roofs require tilt up arrays. Ballasted vs. Attached.
- Roof life – at least 10+ years left.

Fire Setbacks

- 18" from all edges. Differs by AHJ (Authority Having Jurisdiction).

Panel Design & Aesthetics



Black Frame/ Black Back Sheet

Black Frame/ White Back Sheet

Silver Frame/ White Back Sheet

Battery Options

Enphase

Tesla

Do You Need Batteries?

Keep the lights on!

- Batteries not only provide backup power during outages, they also allow PV system to “close the loop” and keep producing power while the grid is down.

How much power from one battery?

How much do batteries cost?

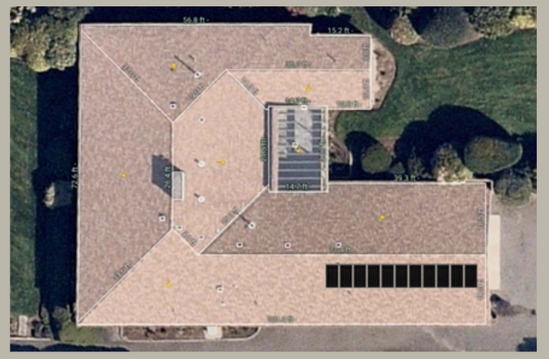
- $15,000 - $30,000+
- Eligible for Federal Tax Credit
- Financing available

Sample Shade Report Data

Summary

Array	Panel Count	Azimuth (deg.)	Pitch (deg.)	Annual TOF (%)	Annual Solar Access (%)	Annual TSRF (%)
1	51	180	16	96	99	95
2	35	270	16	86	100	86
3	7	180	16	96	99	95
4	13	90	16	83	97	81
Weighted average by panel count	-	-	-	-	99	90.2

Option 1
4.51 kW
11 panels



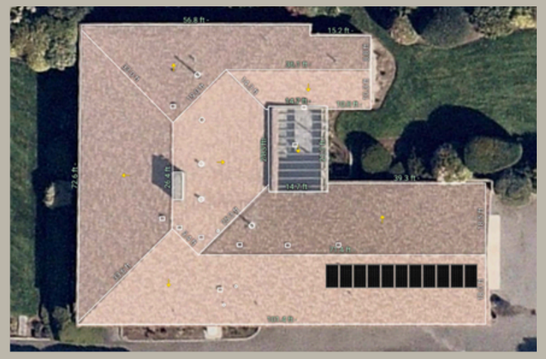
Option 2
9.02 kW
22 panels

Option 3
18.04 kW
44 panels

Sample Shade Report Data

	Option 1: 4.51 kW	Option 2: 9.02 kW	Option 3: 18.04 kW
Equipment			
	11 REC 410W	**22 REC 410W**	**44 REC 410W**
	22.2% efficient, from Singapore	22.2% efficient, from Singapore	22.2% efficient, from Singapore
	Black frame, black backing	Black frame, black backing	Black frame, black backing
	All flush, black hardware	All flush, black hardware	All flush, black hardware
Inverter(s)	**11 Enphase 366W micro**	**22 Enphase 366W micro**	**44 Enphase 366W micro**
Energy Production			
Estimated Annual Output	**4591 kWh/yr**	**9183 kWh/yr**	**18365 kWh/yr**
Typical electric usage offset	**0.5 average homes**	**1 average homes**	**2 average homes**
Module warranties: Prod/Output/25yr	25 / 25 / 92%	25 / 25 / 92%	25 / 25 / 92%
Cost and Credits			
System Price	**$16,886.00**	**$27,665.00**	**$52,065.00**
Dollars per Watt	*$3.74*	*$3.07*	*$2.89*
Sales Tax	N/A	N/A	N/A
Total Installed Cost	**$16,886.00**	**$27,665.00**	**$52,065.00**
30% Federal Tax Credit	($5,065.80)	($8,299.50)	($15,619.50)
Net Cost After Taxes & Credits	**$11,820.20**	**$19,365.50**	**$36,445.50**
Net Metering			
Net-Metering Total, first 10 years**	($8,056.50)	($16,112.86)	($32,225.94)
Cash-Purchase Balance at 10 years	($3,763.70)	($3,252.64)	($4,219.56)
Value of Solar Energy Over the Next 25 Years (see graph)			
Levelized Cost (Cash Purchase)***	**10.63¢ per kWh**	**8.71¢ per kWh**	**8.19¢ per kWh**
Financed Purchase (see below)	**$69.8/mo = 18.2¢/kWh**	**$114.36/mo = 14.9¢/kWh**	**$215.23/mo = 14.1¢/kWh**
vs Cost of Electricity from Utility	**14.7¢ rising to 39.1¢**	**14.7¢ rising to 39.1¢**	**14.7¢ rising to 39.1¢**

Option 1
4.51 kW
11 panels
$16,886
-30%FTC =
$11,820



Option 2
9.02 kW
22 panels
$27,665
-30%FTC =
$19,365

Option 3
18.04 kW
44 panels
$52,065
-30%FTC =
$36,445

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Selecting A Solar Installer

Get multiple bids!

How long have they been in business?
Solar specialists?

NABCEP certified?
Members of WASEIA?
Members of Solar Washington?
Check SolarReviews and EnergySage
Use SolarQuoteCheck.com

Compare product and workmanship warranties.
Select high-quality equipment.
Be wary of high-pressure sales. (Run)

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Q&A

Closing

Sources of information

- Presenters
- www.solarwa.org
- WA DoC and US DoE

National or local faith, denomination or community groups

CONTACT US

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