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October 22, 2019

Report of the Citizens Advisory Committee

Community Solar Program Sub-Committee

Ribbon Cutting for the Denver Housing Authorities' Community Solar Project, Photo credit: Natacha Kiler

2019 Sub-Committee Members

Juqita McClure (Chair)
Kevin Decker
Tom Szymoniak

Summary

This report is not intended to recommend any specific company or organization to the Port of Olympia during its exploration into alternative energy programs.

Community Solar Programs allow community members to invest as a collective to build a large solar array and share in the benefits. This allows individuals who cannot afford the upfront cost of solar, don't have a sunny location, don't own their own home, or simply want solar at a lower entry price. To receive the Washington State Production Incentive, the program must first be pre-certified by WSU extension energy program. Community Solar Programs may receive incentives for participants thereby RCW 82.16.170 outlines the responsibilities of Community Solar Project Administrators under the Washington solar incentive program.

The Community Solar Program sub-committee was requested to outline the following scope of work:

Scope of Work

- ***Understand and outline laws and regulations that govern such projects on Port property***
- ***Determine available solar power capacity on Port owned property, facilities, and long-term green spaces. Consider dual purpose uses for solar installation.***
- ***Calculate how much electric load could be transitioned to solar.***

- ***Determine how much grid capacity is available for interconnection.***
- ***Estimate costs, payback times and lifespan for potential systems, compared to current electric service.***
- ***Estimate benefits, including but not limited to reduced power bills, incentives, training & educational opportunities, and community solar investment opportunities.***
- ***Identify target market for community solar subscribers.***
- ***Create a draft fundraising plan for future Port of Olympia based projects.***
- ***Draft Port of Olympia building policy recommendations to incorporate solar in future projects.***

Laws and Regulations Governing Community Solar

Executive Order 14-04, dtd 4/29/14 (Washington Carbon Pollution Reduction and Clean Energy Action).
RCW 82.16.170
WAC 480-103

In Washington state, community solar companies are regulated by the Utilities and Transportation Commission which registers community solar companies prior to conducting business in Washington or apply for incentive certification from the Washington State University extension energy program.

Community Solar Models: A non-profit "Buy a Brick" model organization, like Olympia Community Solar, works directly with donors who contribute to a community installation owned by a charitable non-profit corporation.

There are several community solar project models available for investors to select.

- ✓ Utility-Sponsored model which the local electric utility organizes and implements the community solar project.

- ✓ United Power model is similar to an electric co-op, which allows multiple homes and businesses to share installation cost for the benefit of solar utility.

- ✓ SolarShares program model allows customers to purchase output from a solar project on a monthly basis, rather than owing the system outright.

- ✓ Special Purpose Entity (SPE) model when a special purpose entity organizes a business in which a contract is negotiated between the participants/owners, the site host, and the utility to set-up the processes for sharing benefits.

- ✓ Community Solar Project model:
  - ❖ Member-Owned model allows individuals to directly own panels in a community solar farm, providing on-bill credits of a utility-owned project.

- ❖ Business Owned model allows the business to establish an LLC with members with member investment returns.
- ❖ Non-Profit model allows donors to indirectly share in the benefits of the solar installation by lowering energy costs for their favored non-profit and demonstrating environmental leadership. There may be possibilities for a non-profit to share benefits with their donor/members.

Determine available solar power capacity on Port owned property, facilities, and long- term green spaces. Consider dual purpose uses for solar installation:

- ✓ Port owned property and long-term green space – There are currently no long-term green spaces available due to local zoning codes. Airport property cannot be considered due to airport buffer space and Tumwater zoning for green space usage.

- ✓ Port facilities – Facility availability is based on future roof replacements, Port leased facilities where roof space was available, location of the facility, and maximum energy usage.

- ✓ Land Lease Holders – Also potential availability, but a Community Solar Developer may consider approaching each land lease holder with a proposal for integration of a community solar project separated from any Port of Olympia involvement.

Calculate how much electric load could be transitioned to solar:

- ✓ To be presented by a Community Solar Developer, or Administration upon approval of future actions by the Port of Olympia to undertake agreement with any Community Solar Developer.

Available Grid Capacity for Interconnection:

- ✓ To be presented by a Community Solar Developer, or Administration upon approval of future actions by the Port of Olympia to undertake agreement with any Community Solar Developer.

Estimate Costs, Payback Time and Lifespan for Potential Systems to Current Service:

- ✓ Estimated payback time is 7-20 years for potential systems according to PSE based on the amount of energy produced each month for a given system.

Estimate benefits, including but not limited to reduced power bills, incentives, training & educational opportunities, and community solar investment opportunities:

- ✓ Benefits: Estimated reducing in carbon footprint reduction according to PSE calculator (see example attached) by 7% using an estimated average monthly bill of $2,500/month.

- ✓ Training & Education Opportunities: Tenino School District created a high school curriculum and has partnered with several Tier partners. International Union of Operating Engineers stationary training program that trains journeyman and apprentice. (see attachment)

- ✓ Community Solar Investment Opportunities: Investment opportunity will provide the investor with the stated benefits mentioned above. Depending on the Community Solar Developer's reimbursement plan, the investor could receive a minimal credit on the electric bill until the investment is paid back in full, or the investor (participant) could receive monetary reimbursement up to the initial investment (contribution). Solar power reimbursement is estimated within several on-line sites at an average of 15 years, depending on the system installed and energy output produced to get a full return on investment.

- ✓ Disadvantages: Depending on the type of solar panels installed, at the transition return to the Port of Olympia, the solar panels will need to be replaced creating a unforeseen cost to the Port of Olympia without benefit for the original 7-20 years, as the Port of Olympia will continue to pay for energy used by paying the difference to the Community Solar Developer to distribute to the investor. Solar degradation should also be considered as well as length of remaining warranty upon return of solar panels to the Port of Olympia.

- ✓ In 2019 the average national solar system cost is $2.98/watt with the average system size of 6 kilowatts (kW) creating an average system cost of $12,516 after tax credits. Average price per watt for solar panels ranges from $2.58 to $3.38 and solar panel costs for average installation range from $10,836 to $14,196 after solar tax credit, according to EnergySage. (https://news.energysage.com/how-much-does-the-average-solar-panel-installation-cost-in-the-u-s/).

How long do solar panels last?

- ✓ As a general solar industry rule of thumb, solar panels last about 25-30 years. However, this doesn't mean that they stop producing electricity after 25 years – it just means that energy production has declined by what manufacturers consider to be a significant amount.

https://news.energysage.com/how-long-do-solar-panels-last/

Solar panel degradation rate:

- ✓ A 2012 study by the National Renewable Energy Laboratory (NREL) found that, on average, solar panel output falls by 0.8 percent each year. This rate of decline is called solar panel degradation rate. Though this rate of decline metric will vary depending on which panel brand you buy, premium manufacturers like SunPower offer degradation rates as low as 0.3%. Solar panel degradation rates are constantly improving as solar panel technology gets better over the years, and degradation rates below 1% are common throughout the industry. In the years since this 2012 study was conducted, more efficient technologies have been developed and many newer panels have just a 0.5 percent yearly decline in energy output.

https://news.energysage.com/how-long-do-solar-panels-last/

Warranty:

- ✓ A solar panel has two warranties: a performance and equipment guarantee. A solar panel's performance warranty will typically guarantee 90% production at 10 years and 80% at 25 years. An equipment warranty will typically guarantee 10-12 years without failing. A solar panel's product warranty insurance covers the integrity of the panel itself and protects you against problems such as manufacturing defects, environmental issues, premature wear and tear etc.

https://news.energysage.com/shopping-solar-panels-pay-attention-to-solar-panels-warranty/

Average Cost:

- ✓ Q1 2018 cost benchmarks for commercial installation...$1.83/Watt (direct current) or $2.10/Watt (alternating current) for commercial systems

https://www.nrel.gov/docs/fy19osti/72399.pdf

Solar panel types:

- ✓ Monocrystalline are the most efficient on the market today, which means you need less panels to fulfill your energy needs. Monocrystalline solar cells are single-crystal silicon, giving electrons greater freedom to move and create electricity. These panels are typically black, giving your roof a sleeker aesthetic. Monocrystalline panels also maintain their efficiency for longer and usually come with a 20 to 25-year guarantee.

- ✓ Polycrystalline panels are made with many fragments of silicon. While this makes them less efficient, it creates less waste in production and are more affordable. They also tend to have a blue tint.

- ✓ Thin Film: Unlike monocrystalline and polycrystalline panels, thin film isn't made of silicon. Instead, it's layered with photovoltaic materials on metal or glass. While the least expensive option, thin film isn't as efficient and likely won't cover the average energy needs without taking up lots of space.

Identify Target Market for Community Solar Subscribers:

- ✓ To be presented by a Community Solar Developer, or Administration upon approval of future actions by the Port of Olympia to undertake agreement with any Community Solar Developer.

Draft Fundraising Plan:

- ✓ The fundraising plan is the responsibility of the Community Solar Developer, or Administrator based on the funding resources needed to complete the project.

Draft Port of Olympia Building Policy Recommendation for Future Projects

- ✓ The Port of Olympia is currently working on the language to be included in future lease agreements and policy for the use of alternative energy sources. Therefore, the sub-committee recommends the Port of Olympia staff continue to work toward the

implementation of language that supports alternative energy integration of new development on port properties.

Recommended Option for Consideration:

1) A Community Solar Developer or Administrator be approved to work with Port of Olympia staff to draft an agreement to address utilization of the best available tenant port property as a source in which to negotiate a future community solar project. Then, both the Port of Olympia and a Community Solar Developer work with the tenant of the approved property to develop an amenable contract with all parties.

2) The Port of Olympia grant a Community Solar Developer the opportunity to work with Port of Olympia staff to draft a contract for the use of the Commercial Business Center in Lacey, Washington as a future community solar project that will include the cost of upcoming roof repairs as part of the operational usage of the proposed solar project budget.

3) The Port of Olympia grant a Community Solar Developer or Administrator the opportunity to work with Port of Olympia staff to draft a contract for the use of the New Market Warehouse or Golf Course properties as a future community solar project that will include the cost of upcoming roof repairs as part of the operational usage of the proposed solar project budget.

4) Community Solar Developer or Administrator act as an independent representative separate from the Port of Olympia, meet with "Land Lease Holders" of the Port of Olympia and purpose the use of existing or new facility usage for potential community solar projects.

5) The Port of Olympia negotiate directly with a reputable solar company to capitalize on long term installation projects with the potential for reduced product rates based on the mass quantity purchases, immediate benefit to reduce energy cost, and reduced emissions.

References:

Olympia Community Solar (Non-Profit)
A Guide to Community solar
About Energy Rates
Community Solar Consumer Guide
Community Solar Fact Sheet
Electric Utility Service Territories
Renewable Energy System Incentive Program, January 2019 Update TC, www.energy.wsu.edu
Puget Sound Energy Green Options

5 Things You Should Know About Community Solar programs

https://www.utilitydive.com/news/5-things-you-should-know-about-community-solar-programs/415420/

1. Who markets the community solar program? It's either the utility or an independent solar developer. Or sometimes a developer works with the utility to provide white labeled community solar services and/or software.

2. What are the size limits? Residential and commercial energy buyers are limited to a percentage of their prior year energy usage — like 50%, 100%, or 120%. Most programs require 5-10 customers minimum, and each customer may not be allowed to take more than 40% of the total system output.

3. What's the economic value proposition? Community solar customers are typically compensated through a solar credit on their utility bill, or perhaps a line item payment. Community solar can be a premium product, where customers initially pay 1-3 cents more than they would for brown power but save in the long term. Or, it can be an immediate savings product where the customer starts saving money right away because the utility bill credit is more than the cost of community solar. Depending on future electricity prices, price escalators, and length of contract term, the long-term value of the community solar can be calculated in the thousands.

4. REC treatment: The green attributes (or Solar Renewable Energy Credits) can be retired upon production by the utility, sold separately from the energy, or can be given to the customer. The REC treatment affects if/how, you can legally describe and market the ("solar") energy.

5. Term length and Contract Length: When offered by a utility, contract terms can be pretty short — like one year, but customers have the option to subscribe for 10 years, 20-25 years, or the life of the system. When offered by solar developers, there is usually a 20-25 years contract term with various contract outs.

According to SEPA's community solar report, as of August 2015, there were 68 active community solar programs; and 24 of those were in Colorado, Massachusetts and Washington. According to SEIA, 4 states (California, Colorado, Massachusetts and Minnesota) are expected to install the majority of community solar over the next two years. SEIA also says that community solar market will add an impressive 1.8 gigawatts in the next five years, compared to just 66 megawatts through the end of 2014.

Attachment: Training Programs

Tenino Tier Program

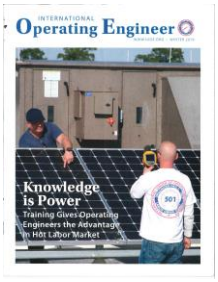
Joe Belmonte, Tenino School District Superintendent
Tenino Schools – 360-264-3400

1) **Who are some of the project partners?** Puget Sound Energy, City of Tenino, Portland Energy Cooperative, Bonneville Education.
2) **Does the curriculum include maintenance and installation of solar panels?** The curriculum is complete. Teachers have been sent to training for both the middle school & high school. Looking to have a full fledge pathway like a trade school. The school district hopes to create a program similar to current programs in the district.
3) **Where are the solar panels being installed currently?** Engineering is currently working on a plan for the location of the panels which will be in the sub-station near the school stadium.
4) **Have any solar companies approach the Tenino school district in support of the program, if so how many?** Yes – South Sound Solar (Kurt Kasner).
5) **How many students are projected to enter the program each year?** Unsure – the is no projection right now, but there are 75 kids with a target of 7,500 in the future.
6) **Have any other schools approach Tenino school district for the curriculum?** Not yet.
7) **The new curriculum was projected to have an up-front cost of $6,462,738, with funds coming from public and private support. Is the cost projection on track? and has Tenino determined a projection continuation cost for future years?** The district is hoping that grants will jump start everything, then in the continuation of the program that the district will have access to state funding to sustain. The district is still working on additional grant pieces and expect to send a request to Trans Alta in the future as well. Grant was awarded from PSE to put I the battery back-up for the solar system.

International Operating Engineer (IUOE) Training Program

Russel Duke
Stationary Engineer Training @ rduke@iuoe.org

1) **Your 2019 Stationary Engineer Training has multiple courses at Training & Conference Center in Crosby, Texas. Can you provide me any specific details about these courses? Are they designed specifically for alternate energy source installation and maintenance? (Solar & Wind)** Here is the latest schedule with descriptions:
https://www.iuoe.org/Portals/0/TrainingCenter/2019%20Stationary%20Packet.pdf
2) **Approximately how many IUOE members have completed this course to date?** Approximately 40 – brand new course.
3) **Are the classes available for apprentice as well or just journeyman?** All members can participate in training as authorized by their local union.
4) **How are these courses being viewed by the field, and is there a waiting list for IUOE members to attend the training?** Students provide excellent reviews of the class.
5) **Does IUOE expect this industry to increase over the next 10 years, and how will IUOE continue to ensure its members are a part of this transforming industry. (maintenance, new businesses, partnerships)** Yes, I expect the industry to increase over the next 10 years. We are certainly open to industry partnerships and new business.



Examples of Renewable Savings Using Solar Choice Only

https://www.pse.com/green-options/Renewable-Energy-Programs/greensolarcalculator

Estimate your costs and learn about the environmental impact of your renewable power choices.* By inputting your monthly electricity use from your utility bill, you can calculate the amount of carbon dioxide (CO2) you could offset through participation in the Green Power and Solar Choice programs as a residential customer.

Enter your electric profile

Average monthly bill in $: 2500

or

Average monthly usage in kWh: 21416

Make your renewable energy choice

Green Power - Mix of PNW renewables: No participation

Solar Choice - Sourced from local solar: $50/mo (1500 kWh)

CALCULATE

Review your results

Your monthly renewable purchase

Estimated bill impact:
$2550.00
This is $50.00 more than what you pay today.

Electric usage covered by renewable purchase
7%

Your annual environmental impact

Carbon footprint reduction
15,894 lb CO2

Trees planted
209

Miles not driven
30,619 miles

Trips from Seattle to Portland not driven
168.2 trips