

# Solar PV for Multifamily Affordable Housing in Seattle

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## Acknowledgments

### *Authors*

Meghan Barrier and Linda Irvine, Northwest Sustainable Energy for Economic Development (Northwest SEED)

### *Contributors*

We received valuable insight and information from Ainsley Close, Washington State Housing Finance Corporation; Joel Sisolak, Capitol Hill Housing; Tom Hunt, Clean Energy Collective; Caroline McCormack, California Housing Partnership Corp. Tom Eanes, Seattle Housing Authority; John Eliason, King County Housing Authority; Chris Jedd, Denver Housing Authority; Chris Dukes, Northeast Denver Housing Center; and Wayne Waite, Everyday Energy.

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## Introduction

As the cost of solar photovoltaics (PV) has fallen, residential installations have soared. Today in the US, a solar installation is completed every 2.5 minutes and over half a million electric customers benefit from the electricity produced on their own roof. However, not everyone is benefitting equally from this surge in solar deployment. Installations in developed markets such as California, Arizona, and New Jersey, are driven largely by middle class customers with median household incomes between \$40,000 and \$90,000 (Hernandez, 2014).

This report presents the exciting potential to bring the benefits of solar energy to low-income households. There are several reasons to pursue solar for affordable housing. First, low income households are disproportionately affected by the cost of energy. Households in the lowest income bracket spend more than twice the proportion of their income on energy than their higher income peers (Bovarnick & Banks, 2014). Second, low income households are already bearing the brunt of climate change impacts and in the interest of fairness and equity, we should counteract those impacts with clean energy. According to the 2014 Green for All Report, “Climate Resilience in Vulnerable Communities,” minorities and low-income residents already breathe dirtier air when compared to more affluent communities, and are more likely to lack health insurance. Thus, as temperatures rise, the chemical interactions that produce smog will have a greater impact on disadvantaged groups. Finally, putting solar on affordable housing can debunk the perception that clean energy is complicated, expensive, and only available to more affluent communities. Solar energy in many forms should be accessible to all communities, regardless of income, culture, or lifestyle. This report examines the feasibility of installing solar on multifamily affordable housing in Seattle. This report aims to:

- Illuminate ways to extend solar energy to new and existing Multifamily Affordable Housing in Seattle
- Provide examples from across the US of solar on multifamily affordable housing
- Address the equity issue by showing how solar can provide benefits to middle and low-income residents.
- Uncover a full range of community benefits that accrue by investing in solar: energy efficiency, jobs, lower utility bills, more affordable and better quality housing.
- Offer policy recommendations for Washington state and local government

Our research shows that solar for affordable housing will not transpire without the dedicated efforts and significant investment of many parties. While this level of coordination between government, utility and private efforts may appear daunting, it is possible, as illustrated by this report. Moreover, it is crucial to delivering a broad range of benefits including stable electric costs, green jobs, improved energy awareness, and in some cases, disaster preparedness and community resiliency.

## Seattle Context

Although we will examine examples from across the nation, we are seeking solutions that will work in Seattle. The following local conditions affect our ability to respond to the challenge.

- **High Demand for Affordable Housing:** Affordable housing is a concern in every county in Washington, and especially in Seattle. The 2015 *Housing Needs Assessment* conducted by the Washington State Affordable Housing Advisory Board found that 12,663 existing units serving low-income are at risk of being converted to market-rate housing due to expiring affordability agreements in 2017. Current affordable housing development streams are not sufficient to take on the high demand or replace the loss of current affordable housing (Mullin & Lonergan Associates Corp, 2015).
- **Existing Community Solar Program:** In 2009, Washington legislators amended the Washington Cost Recovery Incentive to include a generous production incentive for “Community Solar” projects. Community Solar is defined as an installation not exceeding 75 kW, located on local government property, and owned by a group, an LLC, or a utility. The incentives are paid to participants annually by the electric utility with funds that would otherwise have gone to the State as Public Utility Tax payment. A utility can redirect up to 0.5% of their annual taxable power sales or \$100,000, whichever is greater, to customer incentives. Seattle City Light’s Community Solar program, one of the first in the State, has built four projects, including one on affordable housing, and enrolled over 1,000 customers.
- **Limiting Solar Incentive Structure:** Currently, Washington State offers a production incentive that has spurred market growth, supported local jobs, added distributed generation to the grid, and reduced residents’ carbon footprints. However, several limitations on the incentive are holding the commercial market back: First, a “per household” limit on annual incentives caps the size for solar arrays below a threshold where economies of scale can be realized. Second, the incentive is not available to third party owned systems (unless the third party is organized as “community solar.”) Third, the incentive is capped within each utility territory, rather than offered statewide, so utilities with active solar markets such as Seattle risk hitting their cap as soon as 2016. These limitations contribute to the fact that over 90% of installed solar in Washington is on residential single-family homes.
- **Low Electricity Rates:** For a city of its size, Seattle City Light offers the lowest electricity rates in the United States and residential low-income rates are even lower, ranging from \$0.02- \$0.05/kWh. These low rates make a less compelling argument to invest in solar PV from a purely financial standpoint. However, in 2014 City Council approved a six-year rate schedule that calls for a 4.2 % increase in 2015 and 4.9% increase in 2016.<sup>1</sup> Solar PV can hedge against rising electricity rates.

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<sup>1</sup> Read more: <http://www.seattle.gov/light/stratplan/futureStratPlan.asp>

## Definitions

The following terms are common in discussions of solar in affordable housing. The definitions are provided for the purpose of this report, and may be different in another context.

- **Affordable Housing:** Residential housing that is rented by a person or household whose monthly housing costs, including utilities, do not exceed 30% of the household's monthly income (RCW 84.14.010).
- **Low-income household:** A single person, family, or unrelated persons living together whose adjusted income is at or below 80% of the median family income adjusted for family size, for the county where the project is located (RCW 84.14.010).
- **Multifamily housing:** A building having four or more dwelling units not designed or used as transient accommodations and not including hotels and motels (RCW 84.14.010).
- **Low Income Housing Tax Credit (LIHTC):** Low income housing tax credits provide a funding mechanism for the development of low-income housing by allowing an investor (usually a partner in a partnership that owns the housing) to take a federal tax credit equal to a percentage of the cost incurred for development of the housing units. Development capital is raised by "syndicating" the credit to an investor or, more commonly, a group of investors. To take advantage of the LIHTC, a developer will typically propose a project to a state agency, seek and win a competitive allocation of tax credits, complete the project and rent it to low income tenants. Simultaneously, an investor will be found that will make a "capital contribution" to the partnership or limited liability company that owns the project in exchange for being "allocated" the entity's LIHTCs over a ten-year period. Investors only get to claim and keep the tax credits if their units are maintained as affordable housing throughout a 15-year compliance period. In Washington, the Washington State Housing Finance Commission allocates the LIHTCs.
- **Utility Allowance (UA):** The amount that a Public Housing Agency (PHA) determines is necessary to subsidize a resident's utility costs in order to keep the overall housing costs "affordable." Allowances may be provided for any utilities that the resident pays, including electricity, natural gas, water, and garbage collection (Utility Allowances, 2015). This report discusses electricity allowances only.
- **Master Metered vs. Individually Metered Utilities:** Where utilities are individually metered, each household has a separate account with the utility company and pays the bill for their household. A Master Meter measures consumption for the building as a whole. Where utilities are master-metered, the housing provider pays the local utility company for utilities used. In such instances, the utility costs are included in the basic rent levels established by the PHA, and no separate allowance is provided. Many buildings have different metering systems for different utilities (sometimes referred to as "mixed metering").

- **Net Metering:** An electric billing arrangement that allows customers who generate their own electricity (as from solar PV) to use all of their own electricity at no cost, and to “bank” extra electricity for later use at no additional cost. Differences between states' legislation and implementation mean that the benefits of net metering can vary widely for solar customers in different areas of the country. In Washington, customers can bank excess electricity for up to one year, but any excess is zeroed out on April 30<sup>th</sup> of each year.
- **Virtual Net Metering<sup>2</sup>:** A utility billing arrangement that enables individual customers to receive net metering credits on their electric bill for their share of the energy produced from a remote solar PV array. Virtual Net Metering is used in California’s Multifamily Affordable Solar Housing program, enabling a single large PV array to offset electric usage for multiple tenants in a building (CPUC, Virtual Net Metering, 2015).
- **Syndicator:** A syndicator, also known as a “fund manager”, creates funds to pool investor capital. Syndicators then use these funds to purchase the tax credits from the developer in exchange for an equity stake in the housing development. With capital from investors, developers can limit the amount of money they borrow to fund construction, which reduces the developers’ debt and keeps rent affordable (Enterprise, 2015). A Seattle example includes Enterprise Community Partners.
- **Developer:** In the context of this report, a developer can also be called a Low Income Housing Provider. Seattle has many low-income housing developers such as Capitol Hill Housing, Seattle Housing Authority, Bellwether Housing, Plymouth Housing Group, Catholic Community Services, Low Income Housing Institute, Downtown Emergency Services Center, and Bridge Housing.

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<sup>2</sup> For further reading on VNM advantages: <http://blogs.edf.org/energyexchange/2014/10/30/5-reasons-virtual-net-metering-is-better-than-plain-ol-net-metering/>

## Challenges

Solar for multifamily affordable housing faces many challenges, some common to all solar projects and some unique to the multifamily market.

### High Upfront Costs

Although they have fallen 50% since 2010, the upfront costs of solar PV remain high. Incentives that are structured to pay back over time (as opposed to upfront) can make it difficult to overcome initial costs for housing owners, especially on existing buildings.

### Uncertain Incentives

Solar incentives are uncertain and changing. The Federal Investment Tax Credit for commercially owned projects is set to step down from 30% to 10% on December 31, 2016 and the Washington Cost Recovery Incentive is set to expire June 30, 2020.

### Tax Credit Financing Complexity

The vast majority of multifamily affordable housing projects are financed with low income housing tax credits (LIHTCs). After syndication, investors may not want housing providers to make any capital improvements that change the cash flow of a project or reduce the equity basis for calculating eligibility for the LIHTC. Many solar developers use a third party to **work around the LIHTC** to enable solar on existing buildings.

### Split Incentives

As in any rental property, the owner of the property is not necessarily the person who pays the electric bill. Furthermore, in affordable housing, residents receive a “utility allowance” (a rent reduction to enable them to pay utilities without exceeding the affordability cap) that is set by formula and difficult to adjust, even when occupant electric bills change. If a housing provider installs solar and thereby reduces the tenant electric bills, the owner must justify an adjustment in the utility allowance if they are to share in the savings. In many cases, housing providers capture solar savings by using solar to offset common area loads (which they pay for) or to offset loads in extremely low income housing (where the housing provider covers the tenant electric bills and thus would capture the solar savings.)



## Case Studies of Programs and Projects

The following examples illustrate State programs and individual projects that bring solar to multifamily affordable housing. Few projects are feasible without strong State programs and incentives. Some programs, like California's Multifamily Affordable Solar Housing (MASH) specifically aim to boost solar on affordable housing. Other programs, such as Washington State's Community Solar incentive, are not specifically designed to support solar on affordable housing, but could be modified to do so, as with Colorado's Community Solar Garden Act.

### 1. Northeast Denver Housing Center Project (NDHC)



*NE Denver Housing Center PV Installation, NREL*

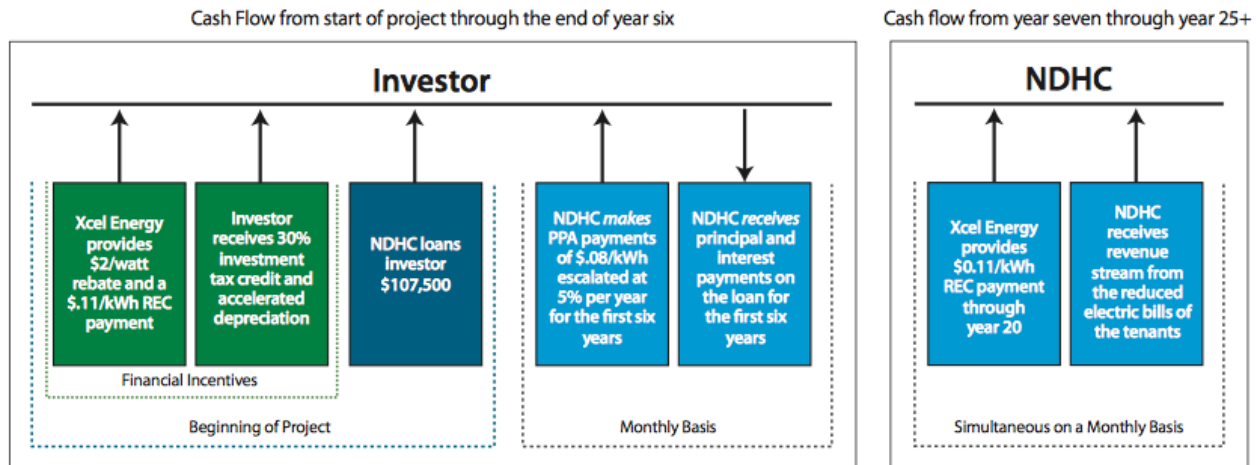
**Background:** Northeast Denver Housing Center partnered with a number of organizations to develop an innovative finance model to install 47.72 kW of solar PV on 12 separate multifamily existing buildings. This provides 85% of average annual electricity usage to 30 affordable housing units.

**Program Goals:** NDHC's goals were to reduce very low-income family bills, provide a job-training program, create an energy

conservation educational program, and develop an innovative financing model that can be replicated.

**Financing:** A third party finance model enabled non-profit NDHC to benefit from the federal tax credit and incorporate solar PV without affecting the LIHTC financing. The third party, a Denver-based investment company, created an LLC with which to capture the federal tax credit and the Modified Accelerated Cost Recovery System (MACRS) accelerated depreciation. As the solar owner, the LLC also receives local utility production incentives. NDHC received a grant from the Colorado Governor's Energy Office, which was invested into the project as a loan to the investor. The investor will then make interest and principal payments to NDHC on the loan. A Power Purchase Agreement (PPA) allows NDHC to purchase the solar electricity from the investor. At year seven, NDHC will have the option to purchase the arrays at fair market value. At that point, the system will have fully depreciated, and the original owner will have captured all the tax benefits. NDHC can then receive the remaining utility incentives, a \$0.11/kWh production incentive payment through year 20 (Dean, Smith-Drier, Mekonnen, & Hawthorne, 2011).





Source: *Integrating Photovoltaic Systems into Low-Income Housing Developments: A Case Study on the Creation of a New Residential Financing Model and Low-Income Resident Job Training Program*. NREL, Sept. 2011. <http://www.nrel.gov/docs/fy11osti/51075.pdf>.

**Utility Billing:** This project changed the utility billing structure so the LLC could realize the savings from the PV system while lowering overall tenant expenses. Before the solar installation, utilities were individually metered and tenants paid their own utility bills. Tenants received a \$25 a month utility allowance from NDHC to cover a portion of their electric bill. After the solar installation, NDHC took over the tenants' utility bills and eliminated the tenant utility subsidy, which had the effect of increasing rent by \$25 per month, but lowering overall tenant expenses. Before solar, a tenant paid rent and utilities; after solar, a tenant pays slightly higher rent and no utilities. From the housing provider perspective, the post-solar utility bills are expected to be less costly than the pre-solar utility allowance subsidy, if not immediately, then in the long term. To hedge the risk of increased electricity usage once tenants were no longer paying for their electricity, all tenants were required to participate in an Energy Conservation Incentive Program.

**Benefits:** First, this program has eliminated electric bills for 30 very low-income families and stabilized electricity costs to NDHC for the 20-year period of the PPA. Second, it established a new job-training program for qualifying low-income residents to participate in PV installation training. To date, two residents have taken jobs in sales for a local solar installer. Third, the creation of Energy Conservation Incentive Program allowed NDHC to reach all tenants, not just those with solar PV on their roof. Lastly, this solar PV project will result in a \$158,000 profit for NDHC over the 25-year lifetime of the solar arrays.

**Lessons:** It took longer than expected to arrange funding for the installations and determine the best billing structure for the owner to capture the benefits and pass them to the tenants and NDHC. The project used a third party LLC to own the solar and sell power to the housing provider, thereby working around LIHTC financing. The unique financial model included a state grant to the non-profit, which was then used to make a loan to the investor. This allowed the non-profit to benefit from a stream of interest income and enabled the investor to build a larger system.

## **2. Multifamily Affordable Solar Housing Program (MASH)**

**Background:** Since 2006, California has funded the California Solar Initiative (CSI) and set aside 10% of the budget for low-income residential solar incentive programs, including the multifamily affordable solar housing program (MASH). MASH received \$108 Million in funding in 2008 and again in 2013, to extend the program through 2021.

**Program Goals:** The MASH program goals are: 1) stimulate the adoption of solar power in the affordable housing sector; 2) improve energy utilization and overall quality of affordable housing through the application of solar and energy efficiency technologies; 3) decrease electricity use and costs without increasing monthly household expenses for affordable housing building occupants; and, 4) increase awareness and appreciation of the benefits of solar among affordable housing occupants and developers. Recent updates include maximizing the overall benefits to ratepayers, providing job training, and requiring enrollment in the Energy Savings Assistance to get incentives (CPUC, Decision Extending the Multifamily Affordable Solar Housing and Single Family Affordable Solar Homes Programs within the California Solar Initiative, 2015).

**Financing:** MASH incentives are paid by the State through the CSI. Incentives are paid up front, once the installation is complete and approved. Levels are based on expected performance. When the program launched, incentives ranged from \$1.90/watt for systems offsetting common area load to \$2.80/watt for systems offsetting tenant area load. In 2013, they were reduced to \$1.10 - \$1.80 per watt to reflect the falling costs of solar (Everyday Energy, 2015).

**Utility Billing:** MASH legislation directed Investor Owned Utilities (IOUs), to file tariffs for virtual net metering in buildings with multiple individual meters served by a single solar installation. All electricity generated is fed into the grid through a generator output meter that measures production. The housing owner specifies how to allocate the energy to common areas and individual tenant units based on the size of the units. The utility then allocates the energy generation accordingly to individual utility accounts where it is netted with the customer's usage.

### Sample Project: San Diego Community Housing Corp

In 2012, the non-profit San Diego Community Housing Corp partnered with a third party owner, Everyday Energy, to install a 20 kW system at their Hacienda Townhomes property. Everyday Energy installed and owns the system. As a for-profit business, Everyday Energy can take advantage of the tax benefits (investment tax credits and depreciation) that are not available to the non-profit Housing Corp. The Housing Corp signed a 20 year Solar Services Agreement (SSA) to purchase energy generated from the system at a fixed price. A commercial electric meter measures the power flow directly to the grid, and SDG&E credits the tenants and common areas as directed in the Virtual Net Metering agreement. It is expected that residents will save 30% on their electric bills.

- **Host:** San Diego Community Housing Corp.
- **Solar Owner & Installer:** Everyday Energy
- **Electric Beneficiaries:** Housing tenants and Housing Corp.
- **Installed Capacity:** 20 kW
- **Installed Cost:** \$112,000
- **# of residential units served:** 52



**Benefits:** As of June 2014, incentive payments paid out by program administrators total over \$65 Million from 323 completed solar projects statewide that have an installed capacity of 20.5MW. This is an average subsidy of \$2.79 per watt installed (inclusive of administration and marketing costs). The benefits of this program flow to building owners and tenants in many forms. MASH locks in lower electricity rates for tenants and building owners and engages tenants in educational programs. A similar program targeted at single family homes (SASH) also provides job training for housing residents, delivering additional benefits to the community beyond the solar energy, and allowing the state subsidy to stretch even further.

**Takeaways:** The MASH program enables multifamily affordable housing providers to overcome the high upfront cost of solar and the tax credit complexities by partnering with third party owners. The State-level program provides a large solar subsidy in return for multiple benefits including long-term energy savings for tenants, job training, and innovative utility billing experience with virtual net metering.

### **3. Colorado's Community Solar Gardens Program**

**Background:** In 2010 Colorado passed House Bill 10-1342, the Community Solar Gardens (CSG) Act, requiring IOUs to purchase an additional 6 megawatts of electricity from CSGs in their renewable energy mandate for the first three years. After 2014, the PUC is responsible for determining the minimum and maximum that utilities must purchase from new solar installations. The maximum size of a CSG is 2 megawatts and none have been smaller than 500 kW. The utility pays a bill credit of retail rate minus a slight deduction, in addition to a REC payment determined by an annual bidding process. The Community Solar Gardens Act does not appropriate funds to install solar PV, but rather requires IOUs to participate by purchasing electricity from these arrays, at least 5% of which must be directed to qualifying low-income residents. In essence, the CSG subscribers subsidize the low-income component.

#### **Sample Project: Clean Energy Collective (CEC) and Denver Housing Authority (DHA)**

In 2013, CEC partnered with DHA to launch the *Community Solar Low-Income Residential Program*. This program directs 5% of electricity produced from three Denver based community solar gardens to offset electric bills for 35 families living in DHA facilities (Clean Energy Collective, 2013).

- **Benefits:** \$7,700 in bill credits the first year for DHA housing residents and nearly \$230,000 in bill credits over 20-year program period.
- **# Families served:** 35
- **Utility Billing:** Xcel Energy credits individual electricity bills. A single low-income family participating in the CSG will see an average reduction of \$425 per year.

**Program Goals:** The Community Solar Gardens Act aims 1) to increase public participation in solar electric generation by opening opportunities for those who cannot participate in rooftop solar generation; 2) to allow renters and low-income utility customers to own interest in solar generation facilities; 3) to allow interests in solar generation facilities to be portable and transferrable; and 4) to leverage Colorado's solar generating capacity through economies of scale.

**Benefits:** In 2012 and 2013, 25 Community Solar Gardens were approved by IOU Xcel Energy to install over 18 MW of solar capacity in Colorado<sup>3</sup>. Similar legislation has been enacted in Minnesota<sup>4</sup> to replicate this program.

**Takeaways:** Where community solar gardens are large enough to capture true economies of scale, subscribers can support some level of non-paying participants. Although the Colorado Solar Gardens Act did not set a minimum size, no solar garden developed thus far has been smaller than 500kW. Washington State's community solar limit of 75kW is far below the level to capture economies of scale.

#### **4. Washington Community Solar Program**

**Background:** In 2009, Washington legislators amended the Washington Cost Recovery Incentive legislation of 2005, to include a production incentive for "Community Solar" projects. (RCW 82.16.110 -130) Community Solar is defined as an installation not exceeding 75 kW, located on local government property, and owned by a group, an LLC, or a utility. The incentives are paid annually until June 30, 2020, by the local electric utility with funds that would otherwise have gone to the State as Public Utility Tax payment. Each utility can redirect up to 0.5% of their annual taxable power sales or \$100,000, whichever is greater, toward incentives. Although none of the participating utilities have reached their annual incentive cap, several are on track to reach it in 2016.

**Program Goals:** Washington's Community Solar Incentive enables more residents (renters, shade dwellers, or those on a fixed income) to participate in the benefits of solar energy and, like the Cost Recovery incentive in general, promotes the local manufacturing and installation of solar PV equipment.

**Financing:** Individually owned systems earn between \$0.15 and \$0.54/kWh, depending on whether they use Made-in-Washington panels and inverters. Community Solar rates are double, from \$0.30/kWh to \$1.08/kWh. The incentive is paid on the basis of total measured kilowatt hours produced.

**Utility Billing:** In addition to an annual incentive, solar installations in Washington can net meter, with monthly excess generation carried forward until April 30, when any excess is donated to the utility. With Community Solar systems which are typically net metered, net metering beneficiaries vary by system ownership: Company-owned systems and systems owned by groups typically offset the electric usage of the host (members do not see any impact on their home or business electric bill); utility-owned community solar systems typically include the value of the electricity produced as a bill offset.

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<sup>3</sup> For further reading:

[http://www.xcelenergy.com/Energy\\_Solutions/Residential\\_Solutions/Renewable\\_Energy\\_Solutions/Solar\\*Rewards@\\_Community@-\\_CO](http://www.xcelenergy.com/Energy_Solutions/Residential_Solutions/Renewable_Energy_Solutions/Solar*Rewards@_Community@-_CO)

<sup>4</sup> For further reading: <https://www.revisor.mn.gov/statutes/?id=216B.1641>



### ***Sample Project: Utility Community Solar - Holiday Apartments, Seattle***

Seattle City Light's Community Solar program has enrolled over 1,000 customers in a series of projects at public sites in Seattle. Their fourth project, a 26-kilowatt installation on Holiday Apartments owned by Capitol Hill Housing, is the first to be installed on the roof of an affordable housing provider in Washington. Seattle City Light paid for the installation of the system. Utility customers can enroll and purchase "solar units" that entitle them to a portion of the production incentive and the value of the electricity produced. As long as the Washington State production incentive is in effect (until June 30, 2020), the electricity produced by the solar installation will be used and paid for by the host, Capitol Hill Housing.

The enrolled participants will earn the production incentive and a bill credit for their share of kilowatt-hours produced at a Community Solar Rate, approved by the Seattle City Council to be roughly equivalent to the small commercial rate. At the end of the production incentive, payments to the community solar customer-participants will cease and the system will be donated to Capitol Hill Housing who will enter into a net metering agreement with Seattle City Light. At that point, Capitol Hill Housing will use the solar electricity at no cost to offset the common area loads, including the laundry facility. The utility costs saved will not flow directly to the tenants of Holiday Apartment but will reduce building operating costs (Seattle City Light, 2015).



*Installation on Capitol Hill Housing's Holiday House*

**Impact:** Since 2009, over 30 community solar projects have been developed across Washington. Utilities are leading the way: Seattle City Light, Ellensburg, Clark PUD and soon, Benton PUD, among others, have utility-owned community solar projects. Also, the higher incentives for the use of Made in Washington equipment have stimulated the growth of a local manufacturing base. As of 2015, there is one active panel manufacturer and several grid-tied inverter manufacturers.

**Takeaways:** While the law provides generous incentives for community solar and residential solar, it does not require utilities to participate in the program, nor does it provide a path through difficult tax and securities issues that arise from efforts to collectively pool funds for investing in solar. Except in the case of the utility owned community solar installations, the law makes no note of how the electricity should be handled, and in most cases the projects are net metered by the host, who uses the electricity and may or may not make any payments for the electricity.

The Capitol Hill Housing example is one of very few examples of skirting the complexities of adding the cost of solar PV to an existing building funded by LIHTCs in Washington. It will benefit the housing provider in six years by reducing its operating costs through the negotiated net metering agreement.

## **5. Other Emerging Examples**

It is beyond the scope of this report to catalog all the examples of solar PV for affordable housing, but there are two other examples that deserve mention.

- 1) The National Housing Trust and Enterprise have partnered to create NHT Renewable. Using combined funding from the MacArthur Foundation, the District of Columbia Sustainable Energy Utility, Enterprise Community Loan Fund, and Bank of America, NHT Renewable will install and operate solar photovoltaic and solar thermal systems on affordable housing properties. To date, they have installed 10 PV systems and 6 solar thermal systems on 13 buildings across 5 properties in Washington, D.C. Their approach entails developing multiple solar projects across a property owner's portfolio at one time. (NHT/Enterprise Preservation Corporation, n.d.)
- 2) The Emerald Cities Collaborative Seattle chapter is developing of an Affordable Housing Sustainability Program that will expand energy and water conservation in affordable multi-family housing, and could conceivably include solar PV. The program aims to create quality jobs with workforce standards, and provide career opportunities for underserved communities. The program will provide a building retrofit coach to support benchmarking, assessments, project development, and monitoring and a financing coach to bring new finance options to building owners. The program will work with the entire portfolio of each building owner to gain efficiencies. (Seattle Projects and Initiatives, 2015)



## Summary of Lessons for Seattle

The above case studies offer a number of creative program and project ideas to share the benefits of solar energy with low-income residents. This study has confirmed there are many low-income housing stakeholders in Seattle who are dedicated to finding a local solution to do this. However, in order to yield results, Washington State and/or the City of Seattle will need to invest time and money in a dedicated program. The following is a summary of lessons learned while conducting this feasibility study.

### State government support is critical

Solar PV installations on affordable housing in Seattle require the cooperation and coordination of government, utility, and private organizations. The research highlights the importance of government support in the form of rebates, direct subsidies, and enabling legislation. The state programs profiled either appropriate funds or mandate low-income participation in solar PV benefits. Washington has not yet designed a program to target solar for low-income tenants or building owners, but the Cost Recovery incentive and in particular, the Community Solar incentive, could be a point of departure for such a subsidy.

The only program in Washington that can serve low-income tenants is community solar and the first affordable solar project was launched in 2014. Current Community Solar legislation can be improved upon to incorporate low-income bill payers, encourage more investment on affordable housing space (government and non-government property), and incentivize a much higher installation capacity.

### Third Party Ownership can simplify development

To date, the majority of affordable housing providers who have managed to work around the LIHTC issue have done so by hosting a third party owned solar PV array on their building. The use of a PPA or SSA to purchase the electricity produced by the solar array at a fixed rate benefits both the tenant and building owner by hedging against rising electric utility rates. Current policies in Washington do not incentivize third party ownership of solar arrays. However, it may be useful to allow incentives to flow to solar developers that benefit affordable housing, regardless of ownership.

### Utility allowances should reflect the impact of solar and efficiency

Housing providers have no incentive to build solar for tenants units unless some of the solar savings are shared back to the housing provider. Rigid utility allowances may fail to take into account improvements in energy efficiency and solar, thus discouraging the provider from paying for upgrades. The Energy Efficiency-Based Utility Allowance (EEBUA) and Energy-Based Consumption Model (ECM) are two new utility allowance methodologies that have been used to obtain more accurate utility estimates in energy-efficient buildings, but there are no existing models for utility allowances and solar.<sup>5</sup>

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<sup>5</sup> See <http://www.enterprisecommunity.com/policy-and-advocacy/issues/green-and-sustainable-housing-and-communities/utility-allowances#sthash.q31Ur79u.dpuf>

Some states have pursued utility allowance reform to ease the process of integrating renewables into affordable housing energy mix. The Washington State Housing Finance Commission has studied the issue (David Paul Rosen & Associates, 2011) and allows housing providers who receive LIHTCs to propose utility allowances that reflect actual usage.<sup>6</sup> In addition, there is a campaign to encourage HUD to address the issue at the national level.<sup>7</sup>

### Utilities have tools to help

Electric utilities have several tools at their disposal to promote solar for affordable housing. They can offer a Community Solar program, such as Seattle City Light's, that deploys solar directly on affordable housing. They can purchase RECs from solar installations, such as Colorado's Xcel Energy is doing from the Northeast Denver Housing Center's installation. They can ease the complexity of solar in multifamily affordable housing through Virtual Net Metering, as they do in California's MASH program.

### Consider the benefits beyond energy generation

A common theme in many of the aforementioned case studies is the pairing of energy conservation and efficiency measures and tenant education with the solar PV investment. Most programs require an energy audit to ensure that the solar PV investment is best applied. Educational programs to encourage energy conservation are also created in attempt to mitigate any potential increase in electricity use. Many affordable housing managers see this as an opportunity to further engage with their tenants and reduce operating costs.

Some solar programs and projects, such as MASH and NDHC's solar PV pilot, have included a job training component in their program. These job training opportunities have been focused on the solar PV and energy efficiency sectors, and represent another avenue to ensure that the money invested in solar development is assisting affordable housing tenants as much as possible.

### Incentives are necessary and can promote broad goals

Targeted state incentives have driven investment on affordable housing in California, Colorado and other states. In case after case, private capital comes to the table when the combination of federal and state level incentives are accessible and where the incentives are specifically intended to increase solar on affordable housing.

Finding the political will to fund incentives is easier when the goals of the program go beyond solar electric generation, to include quality of life issues such as job training, long term stability in electric costs, improving the quality of affordable housing stock, and increasing community resiliency in the face of natural disasters. Cooperation and coordination of government, utility, and private efforts will be necessary to affect change.

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<sup>6</sup> See [http://www.wshfc.org/managers/ManualTaxCredit/290\\_AppendixOUtilityAllowanceProcedures.pdf](http://www.wshfc.org/managers/ManualTaxCredit/290_AppendixOUtilityAllowanceProcedures.pdf)

<sup>7</sup> See <http://everydayenergy.us/utility-allowance-reform-hud-must-act-now/>

## Policy Recommendations

Policy changes are necessary to bring solar to low-income Seattle and Washington residents. Based on our research, Washington will not see the necessary investment in solar for affordable housing until the **State incentivizes investment on a greater scale and removes barriers to third party ownership**. There are several paths that Washington can take and they are not mutually exclusive. First, we can modify the existing cost recovery legislation to enable solar installations that benefit affordable housing residents. Second, we can develop a new statewide program to promote solar on affordable housing (such as MASH). Finally, the City of Seattle could deploy a locally targeted program to drive solar on affordable housing and meet broader societal goals at the same time.

### ***Modify the Washington Cost Recovery Incentive***

The Washington Cost Recovery Incentive could be modified to be more workable for both Community Solar and large commercial installations. For Community Solar installations, we could:

1. Lift the local government property restriction and allow anyone, including an affordable housing provider, to host Community Solar.
2. Increase the allowable size of a Community Solar system to achieve economies of scale that enable a project to provide subsidized subscriptions. For example, Colorado allows Community Solar Gardens up to 2 MW.

To make the cost recovery program work for both community solar and large commercial systems, we could:

1. Remove the per-entity incentive cap of \$5,000 per year, or raise it considerably.
2. Remove or expand the individual utility cap. For example, legislation proposed in 2015 would have made the overall incentive cap a statewide cap, enabling motivated utilities to expand solar on behalf of their customers.
3. Reduce incentive levels from their current level. Community solar advocates have argued that they could make projects work with a production incentive much lower than the current \$1.08/kWh. Individually owned large projects can also be viable with an incentive below the current \$0.54/kWh. By lowering the incentive, provided it were not so low that projects ceased, we would achieve more installed capacity with the same overall incentive budget.
4. Allow incentives to flow to Third Party Owned systems. Nearly every successful example of solar on affordable housing in Colorado and California was implemented by a third party owner, who could take advantage of tax credits and depreciation without jeopardizing the LIHTC structure of the housing provider.

### ***Develop a State program to encourage solar development on affordable housing***

Washington could develop a statewide program that encourages solar development on new and existing affordable housing that works around Low Income Housing Tax Credits. Taking cues from both California's MASH program and Colorado's Community Solar Gardens Act, Washington can create its own unique program. Options include the following:

1. Open the solar market to Third Party Ownership to enable PPAs and SSAs<sup>8</sup>. PPAs have emerged as one of the most popular solar financing methods across the country.
2. Require utilities to offer Virtual Net Metering to share the benefits of solar PV directly with tenants. VNM has reduced costs by streamlining the interconnection and review process, lowering the per unit fixed cost, encouraging optimized site location, and enabling creative financing<sup>9</sup>. With VNM in place, MASH has helped low income residents receive direct benefits of the building's solar system, rather than all of the benefits flowing to the building owner. (CPUC, Virtual Net Metering, 2015)
3. Redirect bill assistance dollars to renewable energy project investments for long-term low-income utility bill reduction as seen in the redirection of LIHEAP funds in California.
4. Mandate state funds toward solar on affordable housing.
5. Mandate a certain amount of electricity produced from community solar or third party owned systems be directed towards low-income tenants.

### ***Develop a local program to encourage solar on affordable housing***

Seattle's municipal utility is a leader in community solar and deeply committed to promoting access to affordable energy for all citizens. Seattle City Light could consider the following courses of action:

1. Develop an "Affordable Solar Rate" at which to credit all solar energy production from affordable housing properties. The rate would be higher than retail, to incorporate the added value of the distributed on-site production and potentially, the RECs. (By purchasing the RECs from these distributed generation projects, Seattle City Light could count them double toward their I-937 targets.)
2. Deploy Virtual Net Metering to assign the solar energy production from a single large solar installation to multiple tenants and common areas in an affordable housing complex.
3. Automatically enroll all residents in Affordable Housing in the Utility Discount Program. Redirect some of the Utility Discount Program funds toward solar deployment subsidies for participating housing providers.

Admittedly, these courses of action would require much evaluation and fine tuning to become reality, but the point is that the City need not wait for the State to prioritize clean energy for all.

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<sup>8</sup> NREL's advice on attracting third party owned PPA financing: <https://financere.nrel.gov/finance/content/don't-be-party-pooper-how-states-can-attract-3rd-party-owned-ppa-financing>

<sup>9</sup> Many states are looking at the advantages of Virtual Net Metering: <http://blogs.edf.org/energyexchange/2014/10/30/5-reasons-virtual-net-metering-is-better-than-plain-ol-net-metering/>

## Potential Funding Sources in Seattle

Currently, Washington does not have a MASH program to provide direct incentives for solar on affordable housing. Nor does it have a Solar Gardens law that directs developers to set aside capacity for low-income participants. Nevertheless, there are some sources of funding that could potentially be leveraged to help affordable housing providers install solar. The following examples show how we could use current structures to creatively develop new programs that would redirect funds- federal, state, or consumer-financed - for investments in renewable energy to provide sustained benefits for qualified low-income bill payers.

### **Currently Available Sources**

- **Donation: Utility Owned Community Solar:** Utility owned Community Solar projects are developed with utility capital and then paid for by customers who subscribe to a portion of the array. In the example of the Capitol Hill Housing array, the system will be donated to Capitol Hill Housing in 2020. This is the only example thus far of a Washington utility-owned system that is scheduled to be donated to a low-income housing provider.
- **Loan: Sustainable Energy Trust Fund:** Administered by Washington State Housing Finance Commission, the Sustainable Energy Trust funds can finance up to \$1 Million in projects that incorporate energy efficiency or renewable energy for up to 10 years. (Commission, 2013) The Housing Finance Commission can negotiate terms that work for the borrower. For example, they recently loaned funds to upgrade a property operated by Plymouth Housing Group. The loan will be made to Plymouth, who in turn will direct the money to the building, thus avoiding a loan directly to the building investors. This arrangement will help ensure there are no issues with the tax credit investor.
- **Loan: Washington Commerce Clean Energy Fund:** Funding can support development, demonstration, and deployment of clean energy technologies that save energy and reduce energy costs, reduce harmful air emissions, or otherwise increase energy independence for the state. Funds have also been approved as Clean Energy Revolving Loan Fund Grants and Puget Sound Cooperative Credit Union and Craft3 are using this funding source to administer loans for clean energy investments for residential or commercial use. (Commerce, 2015) Clean Energy Funds can be used to invest in renewable energy projects on commercial or residential property. The Proposed Clean Energy Funding for fiscal year 2015/2017 includes \$15 Million under the revolving loan. To date, few projects have taken advantage of this loan indicating that upstream barriers are preventing projects from seeking financing.

## ***Potential Untapped Sources***

### **Low Income Housing Energy Assistance Program (LIHEAP)**

The Low Income Housing Energy Assistance Program Funds are administered by the U.S. Department of Health and Human Services (HHS). LIHEAP is the chief source of federal low-income energy assistance and operates as a grant program that assists vulnerable Americans with heating, cooling and/or weatherizing their homes. States receive funding amounts based on a proportion of low-income households, the cost of fuel types available for heating and cooling, as well as climate.

While the goal of LIHEAP is to provide bill assistance and weatherization for low-income families, some states are using LIHEAP funding for piloting solar technology projects which will provide long-term electric bill reduction. In 2009, the California Department of Community Services and Development set aside 3% of the LIHEAP grant totaling \$14.7 million to fund solar PV installs on low-income housing, and to develop a job training program. The project led to installing solar PV and weatherization measures for 545 single family homes and 937 individual units in low-income apartment complexes. (Landey & Rzad, 2014)

With approval from US Department of Health and Human Services, Washington LIHEAP funding could be used in a similar manner to pilot solar energy technology projects for low income housing.

### **Hypothetical Program: CleanCARE**

The Interstate Renewable Energy Council (IREC) has proposed a CleanCARE program to open California's renewable energy market to more low-income participants by redirecting California Alternate Rates for Energy (CARE) funds to renewable projects. CleanCARE proposes the investment in renewable energy assets to reduce net energy used, provide long-term bill assistance and distributed energy generation rather than providing a direct bill discount. (Passera, 2013) CleanCARE would be funded just as CARE is, through a rate surcharge paid by all other utility customers.

The proposal aims to produce bill savings for low-income families at a level equal to or greater than what they currently receive under the CARE program through rate discounts. It is proposed that the low-income resident would receive energy efficiency improvements to first bring down their consumption and then a bill credit based on the performance of the shared renewable distributed generation (DG) developed under CleanCARE. California IOUs currently manage the CARE program; it is proposed they also adopt the CleanCARE administration.

## Moving Forward

Today, the only viable model to bring solar benefits to low-income tenants in Seattle is utility-owned community solar. As previously noted, Seattle City Light has already financed a community solar project on government-owned affordable housing in the city: Capitol Hill Housing's Holiday Apartments. Although benefits to low-income tenants and the building owner/manager are not realized immediately, with time the solar array can be donated to the managing organization, which will then directly reduce operating costs through net-metering and hedge against the rising cost of utility rates. Lowering operating costs will enable low-income housing providers to maintain their current portfolio and their commitment to long term affordability, while potentially freeing up funds to offer more services to residents.

However, this Community Solar model is completely reliant on Seattle City Light's budget, and management decisions. Furthermore, it is subject to the restrictive State incentive, which caps the utility and the project size below the level needed to achieve economies of scale. Thus, although at present it is our only viable model, it is limited in scope. With a small change in state law, Seattle City Light could continue to develop community solar projects on affordable housing rooftops. Doing so would require realizing one or more of the following changes:

1. Allow installations on governmental and non-governmental property.
2. Allow utilities to redirect more than 0.5% of their taxable revenue to incentives, or make the cap on incentives a statewide cap.
3. Allow community solar projects larger than 75 kW.
4. Eliminate the \$5,000 per-entity cap on receiving state incentives.

Clearly, we need a new model that can scale to meet the demand for affordable housing and clean energy. A new model will involve changes to the State incentive, one that brings more options to develop solar PV the table, and one that includes pathways for more Washingtonians – regardless of income and homeownership – to access solar energy. We look forward to developing a model that incorporates our policy recommendations.

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