

# **Perspectives on Community Solar in Washington State: A Mixed Methods Comparative Case Study**

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Abstract: As Washington State moves the electric grid toward a renewables-based future, strong community solar policy has an opportunity to unlock the financial benefits of community solar to traditionally marginalized groups and economically empower those who have historically been denied access to such generators of prosperity due to a policy environment that eschews low-income support in favor of driving adoption among affluent Washingtonian homeowners. This study provides a comparison of state energy policymaker perspectives on community solar policy with the perspectives of the setup's main beneficiary groups, home renters and to a lesser extent, home owners. The study sample suggests that not only is community solar more popular among the general population than policymakers perhaps realize, but that there is more than enough demand for community solar projects to support the industry if existing legislative and regulatory barriers can be removed or at least made to be less restrictive and exclusive to utility-owned community solar projects. As such, the study recommends that the state government remove the restrictions currently grounding the community solar market, and in addition implement incentive policies that drive higher inclusion of low and middle income Washingtonians in community solar projects to distribute environmental and financial benefits to a larger proportion of the population and begin addressing the state's ever-growing socio-economic divide.

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## INTRODUCTION

Climate change is the defining crisis of the 21<sup>st</sup> century. As the atmospheric greenhouse effect continues to amplify, countries, regions and localities alike face an immediate imperative to act swiftly to curb and reverse global warming, which among other things requires us to stop putting carbon dioxide and other hydrocarbons into the atmosphere. The path to transitioning away from a hydrocarbon-reliant society requires transformational changes in many sectors across the world, all of which are necessary to achieve the required level of change. One such sector requiring this change is the energy system, and this study will focus on one area of opportunity with the potential to affect large positive environmental and socio-economic impacts. Specifically, this study examines the future viability of community solar programs within the state's electric grid.

### KEY TERMS

**Community Solar:** Any solar project or purchasing program in an area in which the benefits of the project flow to multiple customers such as individuals, non-profits, businesses or other groups.

**Energy Burden:** The percentage of household income that goes energy costs (electricity, home heating, transportation).

**Net Metering:** An electricity billing mechanism that allows consumers who generate some or all of their own electricity to use that electricity any time through bill credits, instead of just when the power is produced.

**Virtual Net Metering:** A bill crediting system in which multiple customers receive benefits from a net-metered renewable energy project with resulting bill credits distributed to participating customers electric bills.

**Cost Shifting:** The increase in energy costs that a customer group pays due to another customer group paying lower prices.

Washington State's journey toward a renewable electric grid marked a watershed moment in 2019. Newly committed to pushing the state out of the fossil fuel economic paradigm and into a more sustainable energy future, the state legislature passed the Clean Energy Transformation Act (CETA), a 30-year roadmap to eliminating coal-fired energy production by 2025, achieving a 90% renewable grid by 2030, and reaching a 100% renewable electric grid by 2045. Post-2019,

the question is not whether Washington will achieve a 100% renewable energy grid, but when and how it will reach the milestone.

Despite a 15 year-old commitment to transition 15% of Washington's energy mix to non-hydroelectric renewable energy sources, solar energy currently accounts for less than 0.3% of Washington's energy mix. However, solar is primed to gain prominence due to the recent remarkable decline in solar production and energy storage costs, along with the state's growing legal commitments to clean energy. Policymakers many policy options available to facilitate the expansion of solar energy in Washington, and the "all of the above" operating principle suggests that they should pursue most or all of them. Within the "all of the above" principle, specific functions of each policy are employed in service to the larger integrated strategy, rather than in the vacuum of a zero-sum competition for individual policy adoption. This will better harness each policy's situational strengths and contribute more to the robustness of the overall. This paper will compare state solar policies with the "all of the above" principle to identify areas of strength, neglected policies awaiting implementation, and the general efficacy of state solar policy in promoting a desirable future. More specifically, this study explores the question of how well does Washington solar energy policy promote not just positive environmental outcomes, but positive socio-economic outcomes as well? A key focus of the study will be examining the potential for supporting Washington's low and middle income (LMI) population through state community solar policies. The study examines the broader solar policy landscape within the state, before focusing into an examination of community solar's presence in Washington, the state of community solar policy as it stands, and how to strengthen low and middle income customer access to the benefits of solar energy.

The investigation will proceed via a review of the current state of Washington community solar legislation and its effect on the community solar sector, a community survey administered in three , and an interview process with state energy committee legislators and a community solar professional. The study will then compare gathered data to identify points of commonality and difference in opinion between policymakers and the more general population in hopes to establish a more robust information set to better inform community solar policy discussions in the future.

## **LITERATURE REVIEW**

Washington State's recently passed solar policies help prepare the state's nascent industry for more rapid development, but fall short of addressing the state's growing economic divide. As of 2019, only 0.29% of the state's electricity mix came from solar energy sources, as the grid relied more heavily on other renewable sources such as hydropower (54%), and wind (4%), while still drawing substantially on more traditional electric sources such as natural gas (11.6%), coal (10.7%), and nuclear (4.9%) (Washington State Department of Commerce, 2020). With \$684 million invested in solar projects, the state remains on the relative fringe of solar energy expansion, ranking 34<sup>th</sup> out of 50 states in solar energy adoption to date (SEIA, 2020). Washington solar industry is primed to expand quickly thanks to political, economic, and environmental factors that have coalesced into a favorable environment for the rapid development of solar projects in the state. As the effects of climate change compound, the growing desire to reduce greenhouse gas emissions by changing energy and electric generation practices raises interest in renewable energy. Furthermore, solar is rapidly displacing coal and natural gas as the cheapest electric generation source available. Solar is an industry disruptor thanks to technological progress driving price per kilowatt-hour down (SEIA, 2020) below

natural gas and coal (Eckhouse, 2020). State policies incentivizing the generation of solar energy further support the solar market, increasing the industry's long-term growth prospects within the state.

With solar adoption on the state's horizon, the question is no longer whether solar will become a larger part of the state's grid, but *how solar will be integrated into the state economy, and who will get to benefit from solar's advantages*. As of July 2018, Washington State ranked 10<sup>th</sup> out of 50 states plus D.C. and Puerto Rico in income inequality. Data provided by the Economic Policy Institute indicates that the mean earner from the top 1% of Washington incomes makes 24.2 times more than the mean earner from the bottom 99% of Washington incomes (Sommeiller, 2018). Washington State's economy has followed the national trend of increasing income inequality, an indicator of how stratified the socio-economic system has become. As unchecked inequality carries many negative political, social and economic consequences, Washington has an imperative to empower disadvantaged communities and begin to correct the economic divide that characterizes the state's demographics. Solar has historically been an attainable alternative only for the wealthy, yet solar does have potential to reduce energy costs for people across economic strata, and even to benefit those who are among the most disadvantaged in the state. Depending on how and by whom the resource is developed. Thus, solar has the potential to serve the dual purpose of decarbonizing the grid while simultaneously reducing future economic inequality within the state.

Solar is a lucrative, fast-improving energy technology that is highly economical given enough time. However, its high start-up costs and lengthy payback periods meant that most historical solar investors had to be well-off, while low and middle income individuals were less likely to expend scarce resources on a high cost project. Solar wealth disparities continue today,

with only 18% of 2018 solar adopters<sup>i</sup> falling below the national median household income of \$61,937 (Guzman, 2019). However, solar adopters exist across the income spectrum, indicating both interest and ability for customers of all means to access generation. Furthermore, solar's recent cost reductions have made the energy source more accessible to low-net worth investors. The state of affairs, while improving still indicates that the benefits of solar adoption primarily go to those with the wealth to shoulder high startup costs.

Since solar owners tend to be more wealthy, state solar policy tends to disproportionately benefit wealthy Washingtonians more than poor and/or disadvantaged Washingtonians unless specifically designed to support low-income populations. For example, Washington's 2019 Solar Fairness Act, also known as E2SSB 5223 provides only limited support to expand the "fairness" of access to solar energy. E2SSB 5223 expanded a rooftop solar pricing program called "net-metering", allowing rooftop solar electricity producers to sell electric production to power utilities at the retail electricity rate. This pricing structure differs from "buy all sell all" in which rooftop solar producers sell power at the wholesale rate (a fraction of the retail rate) and buy power back from the grid at the retail rate (WSU Energy Program, 2019). The act increased the cap under which utilities paid net-metering rates to solar producers from .5% of the grid to 4%. Under the old rule many parts of the state had already reached the .5% net metering cap, meaning new adopters could not benefit from the incentive (Trabish, 2016). In effect, this opens the door to additional residential solar by ensuring that the favorable pricing terms are extended to a larger fraction of the utility market/portfolio. From an environmental standpoint, the bill is a huge success because it broadens the mandate for utilities to include a greater fraction of residential solar (Washington State Senate, 2019). However, it does not do anything to address the way in which access to residential solar energy is limited by upfront costs.

Underappreciated in E2SSB 5223 were the scheme's end-equity consequences. Despite recent noticeable trend changes, as of 2018 residential rooftop solar owners and adopters continue to disproportionately consist of wealthy households on the top end of the income spectrum due to the high initial investment required to pay for the panels and installation (Barbose, 2020). E2SSB 5223 helps to defray that initial investment more quickly, promoting adoption, but it does nothing to lower the upfront costs themselves. As a result, the prime beneficiaries of E2SSB 5223's incentive expansion will be the already-wealthy. Due to the demographic characteristics of rooftop solar owners, the policy will be regressive, distributing financial resources disproportionately to the top end of Washington's income spectrum. While promoting solar adoption into the future, the Solar Fairness Act will do little to even the state's socio-economic playing field. E2SSB 5223's partial success reveals that Washington's long-term solar policy must be more cognizant of Washington's equity challenges. As residential solar energy is poised to increase in prevalence due to both cost reductions and some favorable policy, now is the time to address critical equity issues before the industry becomes a larger part of the state's energy mix and becomes more cumbersome to meaningfully change.

"Community Solar" is a cooperative model of community-supported and subscribed solar farms. Customers pay a modest investment which can be as little as \$50 into the project, and receive compensation for the amount of energy that their investment was responsible for generating. This decentralized ownership model helps solar adopters move forward on sustainability goals without paying rooftop solar's large up-front costs that would discourage them from investing (Solar Washington, 2020). This collective model gained prevalence in recent years as an alternative to the pricey rooftop option. Renters, who tend to be lower-income and don't own their roof, along with lower-income homeowners have the option to access the

financial benefits of owning a piece of a solar array without having to pay the massive upfront costs that historically drove all but the wealthy from the market. Although both are important features of a decarbonized economy, community solar is the more equitable solar production model that helps decarbonize the residential sector while democratizing solar's benefits.

Community solar does receive some policy support from the state's Renewable Energy Production Incentive Program, which expanded to include community solar projects in 2009 (Washington State House of Representatives, 2020). However, a \$110 million program cap (hit in 2019) and the lack of dedicated supports for low-income customers leaves room for future policy improvement. The solar policies affecting Washington today, while useful adoption accelerants, are incomplete economic policies that fail to empower the less wealthy and reduce inequality. Furthermore, fully realizing community solar's potential requires plugging each customer's community solar investment onto their electric bill. Until an electric bill crediting mechanism such as a virtual net metering policy that is made available to non-utility owned projects is mandated, community solar development will continue to proceed at a slowed pace. For the moment, community solar lacks strong state policies to aid its development and speed renewable energy adoption among low-income households. However, community solar legislation has included LMI components beginning with legislation passed in Colorado in 2011. The fact that several other states have passed specifically low-income community solar legislation means that Washington State can examine these policies in hindsight and incorporate best practices into future policy efforts.

**Direct Incentive Options:** One type of assistance program is a direct incentive, or the awarding of higher rates of solar renewable energy credits (SREC) dependent upon how many LMI customers the community solar farm incorporates (O'Shaughnessy, 2018). There is no penalty

for having no LMI participants, but the rates increase with the proportion of LMI participants. This encourages projects to organically seek LMI participants with no minimum or maximum on the number of LMI customers. Direct incentive policies such as these could result in higher LMI participation than a quota might entail, but can lead to mixed LMI inclusion results if used as the sole policy tool, because there is no other encouragement to add LMI participants.

**Carve Out Options:** Another approach, which has been taken by Oregon and Hawaii, carves out a minimum portion of the farm's generative capacity for exclusive use by LMI customers, allowing non LMI customers to subscribe to the remaining share. This "carve out" strategy ensures a minimum level of LMI customers within every community solar project, guaranteeing the program's usefulness to the lower-income bracket. Non-LMI customers can join above the quota, which reduces overall costs to the array, and limits the risk of default on a community solar project. Carve-out strategies are not perfect. LMI minimum quotas both have the potential to cap company inclusion of LMI customer at minimum levels while raising energy rates for non-LMI customers.

**Carve-Out and Incentive Synthesis Options:** The problems apparent in a carve out strategy can be avoided through the use of state incentives to defray the cost of accommodating LMI customers. This comprehensive approach synthesizes the strengths of carve-out and incentive-based policy (Low Income Solar, 2020) (NREL, 2019), providing the both the baseline adoption and the impetus to continue attracting low income customers after minimum levels of LMI customers have been reached. There are several community solar policy options available, each with their own strengths, and weaknesses, and the best approach from the perspective of decarbonizing LMI energy bills is to adopt a comprehensive strategy that includes both an LMI carve out component as well as a direct incentive offer.

**Virtual Net Metering Options:** An effective community solar policy requires that community solar customers are able to access their benefits through their electric bill and not their bank account. On-bill crediting can be achieved through virtual net-metering, which non-rooftop solar owners to access the same bill credits as long as they are participants in a community solar project. By distributing benefits in the form of electric bill savings, community solar projects can avoid taxation laws that would otherwise artificially increase the price of buying into such projects. Virtual net metering, while an increasingly popular policy in other states, has yet to be accepted by Washington legislators and utilities, but has the potential to unlock the industry within the state and allow it to reach a whole new level of solar adoption.

**Sales and Use Tax Credit Options:** Community solar project benefits can also avoid becoming too deeply entangled in financial regulations by realizing benefits through tax credits and exemptions rather than cash. State and local policies that follow this model would grant either income tax credits or sales and use tax credits to incentivize people to buy into projects. As Washington State does not have an income tax, it can only utilize such a strategy by implementing a sales and use tax credit. As the sales and use tax is well understood to be a regressive structure, exempting small-dollar investors from this tax could have a progressive effect of empowering low-income residents (Coughlin et al, 2010). However this option could be complicated if community solar projects continue to be only administered through utility projects, which tend to charge higher premiums, thus once again restricting the customer base to higher net worth individuals.

Washington State would benefit from an integrated approach that incorporates LMI carve outs and direct LMI incentives for community solar arrays. This would both drive a minimum level of adoption that would generate a certain amount of guaranteed momentum, while also

benefiting from incentive policies that motivate project operators to include more LMI participants beyond just what is required by law. Whichever model Washington chooses, it will need to implement a virtual net metering policies that requires utilities to allow community solar customers to reap the benefits of community solar through on-bill credits rather than through the traditional financial system which is subject to more taxes and benefit dilution. This would make community solar more profitable for customers, drive up demand for community solar projects, and distribute solar energy's benefits more equitably among the state's population.

Despite its role to empower low and middle income solar adopters, community solar projects in Washington receive less policy support than rooftop solar due to legislation at both the state and national level. Rooftop solar owners receive tax benefits from the Federal Solar Investment Tax Credit while community solar participants do not (Sunbridge, 2020). The Federal Solar ITC is a 26% tax credit specifically for homeowners who also own their solar panels, and pay enough taxes to qualify for the credit. Home renters, or people who lease solar panels, or those who don't pay enough in taxes each year, are all excluded from the 26% credit, which reduces to 22% in 2021, and ends in 2022. The Federal Solar Investment Tax Credit has a similar, if not more problematic equity impact than Washington's Solar Fairness act. The credit succeeds at encouraging wealthy homeowners to install rooftop solar, which helps to decarbonize the economy. It also distributes more government benefits to the top bracket of income earners than to the bottom bracket, and so does little to address Washington's ongoing inequality issue.

As of 2018, several U.S. states operate incentives programs to facilitate community solar adoption for low and middle income customers (O'Shaughnessy, 2018). By contrast, Washington's community solar incentive program does not specifically support low/middle

income (LMI) customers. State legislators attempted to shore up LMI community solar policy supports in 2020 with ESHB 2248. ESHB 2248 specifically concerned itself with making the benefits of community solar accessible to lower income Washingtonians, as was made clear in the bill's opening section.

“The legislature finds that while previous community solar programs were successful in stimulating these benefits, the programs failed to provide an adequate framework for low-income participation and long-term market certainty. The legislature finds that the vast majority of Washingtonians still do not have access to the benefits of solar energy. The legislature intends to stimulate the deployment of community solar projects for the benefit of all Washingtonians by funding the renewable energy production incentive program for community solar projects and by broader participation opportunities, especially by low income households and low-income service providers” (Doglio, 2020).

The core component of ESHB 2248's drive to support low income access to the benefits of solar energy was the replacement of the state's already capped \$110 million Renewable Energy Production Incentive Program with the “Community Solar Expansion Program” which was an LMI direct incentive to community solar operations for the purpose of providing direct benefits to the project's low income subscribers (Washington State House of Representatives, 2020). Although this direct-incentive framework was not the comprehensive policy discussed above, it still provided a strong avenue through which to financially support community solar's development in coming years. ESHB 2248 passed through the state house with 89 votes for and 9 against, and the state senate with 36 votes for and 12 against. However, the bill never passed into session law, as it was vetoed by Governor Jay Inslee on the grounds that the operating budget was under immense strain from the economic contraction caused by the COVID-19 pandemic.

“Circumstances have changed dramatically since the 2020 supplemental operating budget was approved by the Legislature last month. The COVID-19 pandemic is having catastrophic effects on the health and welfare of Washingtonians. It will also have a major impact on the economic health of our state. I have conferred with leaders in the House of Representatives and Senate, and we agree that we must prepare for the effects of the lost revenue that will result from this pandemic. For these reasons I have vetoed Engrossed Substitute House Bill No. 2248 in its entirety (Inslee, 2020).”

Although it made it through the legislature, ESHB 2248 was unable to clear the governor’s desk ultimately due to fiscal concerns for the program’s financial impact. Although the bill’s success was encouraging for its future passage prospects, the issue of community solar continues to suffer from a lack of visibility and industry support and that was spoken to by Mason Rolph, founder and president of Olympia Community Solar.

“Yeah a big part of [the problem] is there hasn’t been a champion for the policy before. When we came into the picture, especially, like this last year was really the first time we really said, ‘let’s just do a virtual net metering bill, let’s emulate the best practices we’ve seen across the country and just write the best bill possible’. We did that and I’ll be honest, we’re not policy experts, so our bill had holes in it. It had flaws, it had oversights... So I would say a lot of it is because there hasn’t been an industry here, so there hasn’t been someone pushing for it. I’m not saying that I’m that sole person, that champion who should be doing it, but I’ve definitely stepped into that role a bit.”

(See Appendix C)

Although community solar has enjoyed a high level of adoption in some states, it’s presence in Washington is largely limited to small pilot projects and utility-owned projects which charge adopters a higher premium. This still counts as community solar, but does nothing to address the state’s underlying economic inequality problem by incorporating LMI customers. As such, the still nascent non-utility owned community solar industry has thus far struggled to gain traction in policy talks, although they have still made progress.

The only form of solar consistently available to low-income people, community solar provides immediate benefits to customers who are more likely to be part of lower-income brackets than residential solar owners. However, Washington's solar policy focus to date has been confined mostly to the residential and utility-scale solar adopters. Low levels of solar deployment within the state thus far provides a unique window of opportunity for policymakers to buttress the third and arguably most important solar sector, the one that disproportionately aids LMI Washingtonians. Incorporating mandatory LMI minimums, LMI-based community solar SREC incentives, and financial benefits into electric bills directly through virtual net metering, could allow lower-income Washingtonians to more easily access solar, decarbonize, save money, and prosper. This would have the triple dividend of reducing income inequality (U.S. Census Bureau, 2020), promoting economic activity, and perhaps most importantly driving decarbonization in the renting sector, which has heretofore remained stubbornly hydrocarbon-reliant. Furthermore, facilitating a policy environment that allows community solar projects to more comprehensively plug into the grid will pay large dividends to LMI households, drive decarbonization in the residential energy sector, and encourage more community solar projects in the future.

Faced with an opportunity to have a large formative influence on LMI community solar adoption, the state and local governments could benefit from learning more about the viability of such a program within their own areas before moving forward with ambitious policies. The Washington community solar case study attempts to answer some of the questions surrounding community solar within Washington, both by gathering data from relevant policy-making figures, and by seeking out the voices that can oft be absent from policy debates, those voices being primarily low or middle income home renters. This approach seeks an inductively

generated base of knowledge on the issue that policymakers can rely on when making decisions on community solar policy in the future.

Past solar policy in Washington has focused on solar initiatives that primarily drive adoption among and accrue benefits to land-owners and utility-scale investors. This focus is understandable due to the greater resources available to these groups which may result in increased lobbying power and attention. By contrast, community solar policy programs have not been pursued, and their primary beneficiaries, home renters, have remained as a muted or altogether absent voice in the policy making process. To rectify this power imbalance, this study seeks Washington renter input to better inform the policy debate moving forward.

## **METHODOLOGY**

This Washington-based case study employs a mixed-methods design including an opinion survey of renters and homeowners regarding community solar from cities particularly well-matched to solar energy projects, combined with qualitative interview data from state policymakers and community solar stakeholders with knowledge of solar policy and projects in Washington. The survey methodology, results and discussion are presented first, followed by the same structure for the interviews. Analysis from a comparison of these two streams of data are then used to support final conclusions.

## **DATA COLLECTION - SURVEYS**

The study sought to compare the qualitative, professionalized understanding of community solar and its place in the Washington Administrative Code (WAC) by engaging the primary stakeholders and beneficiaries, otherwise known as home renters, themselves. This

portion of the project used an in-person survey to gather quantitative data from renters in Washington cities that most closely resemble a model city for solar energy deployment<sup>ii</sup>.

Survey data collection has become increasingly difficult in recent years as phone response rates have plummeted, while online surveys often struggle to reach the right population in sufficient numbers. The study addressed this issue by gathering survey data in-person. This was done by canvassing people at grocery stores or other public places with the help of small in-kind incentives such as a sparkling water or a piece of fruit leather. The survey began with a brief explanation of the nature of community solar, then examined both the nature and the extent of renters and homeowners motivation to participate in community solar or other solar energy projects. The survey was composed of yes/no, multiple choice, and likert scale questions designed to identify the nature and extent of people’s motivations. The study was administered in the cities of Yakima, Wenatchee, and Kennewick. This gave a certain limited level of generalizability while focusing on areas particularly well-suited to community solar projects.

## **DATA ANALYSIS – SURVEYS**

The community solar survey was administered in public spaces such as parks and outside grocery stores to introduce an element of random selection. The survey consisted of eight questions designed to gauge respondent opinions on solar energy in general and community solar projects in particular in an effort to determine the viability of community solar projects in cities such as the polled cities of Wenatchee, Yakima and Kennewick.

Variable Name	Variable Type	Response Options
Renter Status	Nominal	Renter, Homeowner
Solar Adoption Status	Nominal	Yes, No, Don’t Know
Purchasing Motivation	Nominal	Environmental, Financial

Purchase if Affordable	Nominal	Yes, No, Don't Know
Relative Expense of Solar	Ordinal	Less, About the Same, More, Don't Know
State Financial Support for Community Solar	Ordinal	Increase, Maintain, Decrease, Don't Know
Level Of Interest	Interval/Ratio	1 (Not Interested) – 5 (Very Interested)
Factors Affecting Willingness to Adopt Community Solar	Nominal	Cost, Availability, Lack of Information, Lack of Interest, Other

Survey data were compared by using cross-tabs with chi square to analyze nominal variables such as the nature of the renter's motivation, what factors would affect their willingness to buy into =, and whether they would hypothetically be willing to buy power from such a project. Similarly, ordinal variables such as the extent of the renter's motivation or their level of education regarding community solar projects will be analyzed and compared to the inductively generated hypotheses through the use of cross tabs with chi square tests as well as spearman's correlations if both variables being compared are ordinal.

## LIMITATIONS

The generalizability of the study's findings may be limited by several factors, including that despite conducting the survey in three different areas particularly suited to community solar, a lack of information on a state similar opinions of people from these locations are to those in other sites across the state. Further, despite achieving a high sample size for a survey, the total fraction of the public surveyed in each location was low, and thus may not fully capture the breadth of opinion in each site. Additionally, the study's stated intention to further promote the deployment of community solar within the state could be seen as a pro-solar bias that may have swayed some survey responses. Another concern is that the survey's designed simplicity may

have resulted in a measurement error that oversimplified the issue at hand and obfuscated important details that may be more apparent in a more in-depth survey. Finally, it's likely that the sample size was simply too small for detecting statistically significant differences in some cases. As such, the study's findings, while certainly of interest, may be of limited utility in the near future.

Despite its flaws, this approach attempted to gather data in an unbiased fashion by gathering data in locations not associated with solar energy. This hopefully allowed the survey to avoid the convenience pitfall of obtaining survey participants who were more likely to agree with the researcher due to knowing them or holding similar personal views. The simple survey design reduced the amount of effort required to administer and take the survey, saving respondent and researcher time, and lowering the bar to take the survey. This allowed the researcher to cover a wider breadth of individual perspectives and reach as many people as possible. Finally, the community solar context used in the study, while admittedly biased, provided needed visibility to a policy window that might otherwise fail to garner attention due to the fact that the primary stakeholders are less-resourced, perhaps more time-constrained renters with less ability to influence the public discourse on their own. As such, it may provide a public good to raise awareness of community solar policy options toward similar visibility to the more conventional solar policies that have been pursued in the past. A limited study conducted by a single researcher required some compromise, and this methodological approach attempted to collect data that was granular enough to provide nuanced insights, while also sufficiently shallow to reach a larger sample.

## **SURVEY RESULTS - SURVEY SAMPLE**

A total of 310 respondents completed the survey in the three cities, including 65 from

Wenatchee, 123 from Yakima, and 122 from Kennewick. Preliminary analyses showed no difference in responses according to city, so the responses were pooled and the aggregate is reported here. Renters comprised 60.6% of the sample, with homeowners making up the remaining 39.4%. The survey analysis proceeded with the primary intent to prioritize renter respondents, but also accepted homeowner responses.

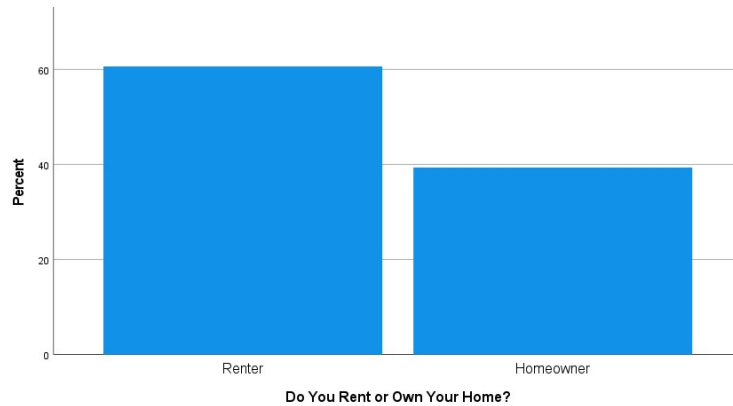


Figure 1: Renter to Homeowner Distribution

In total, only 6.5% of respondents used solar energy, 88.7% did not, and 4.8% didn't know if their power mix included solar energy. Despite residing in sun-rich areas, solar energy use by the sample population indicates that solar adoption remains exceptionally low even in highly suitable areas.

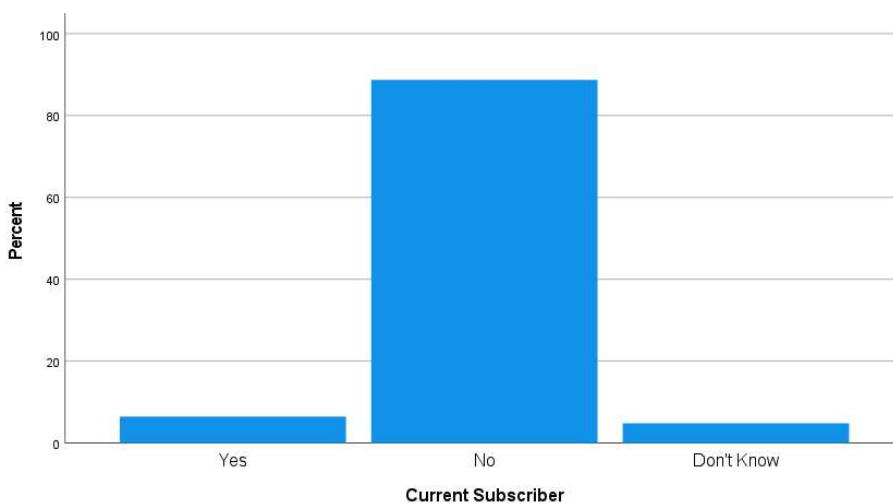


Figure 1.1: Current Solar User Status

When asked for their primary motivation when purchasing electricity, 61% of respondents indicated that they were most concerned with financial factors when making such purchasing decisions. Many respondents anecdotally indicated that both factors were important to them, but when forced to choose one, indicated that they were more motivated by financial factors. This suggests that efforts to increase solar adoption should tend toward a financially centered pitch to capture more attention from people that may not be interested in solar for its environmental benefits.

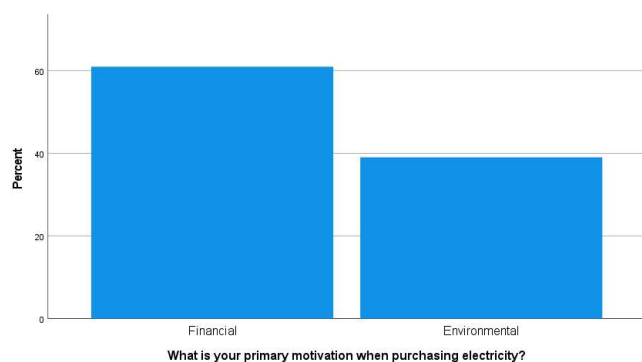


Figure 1.2: Primary Motivation When Buying Electricity

Most respondents (80%) indicated willingness to purchase solar energy if they could buy it in an affordable format. 7.7% said they would not purchase solar energy regardless of affordability, and 12.3% didn't know whether they would or not.

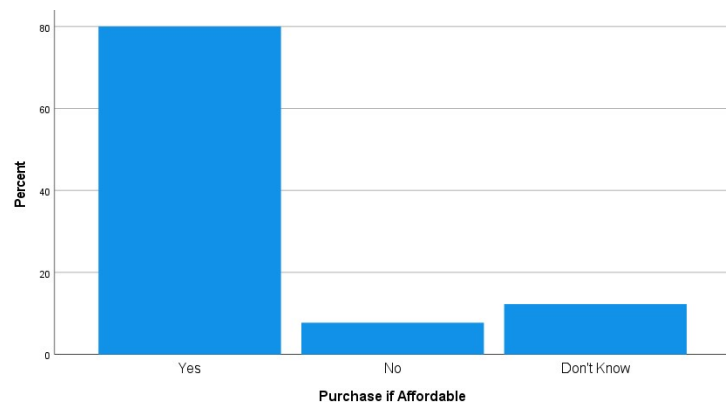


Figure 1.3: Willingness to Buy Solar Energy if Affordable

The question of solar's expense relative to other energy sources drew far more varied responses. The plurality of respondents (37.4%) thought solar energy was less expensive than other energy sources, while 23.9% thought it was more expensive, 17.7% thought it was equally expensive, and 21% didn't know. This indicated that general opinions on solar energy expenses have yet to reach any meaningful consensus.

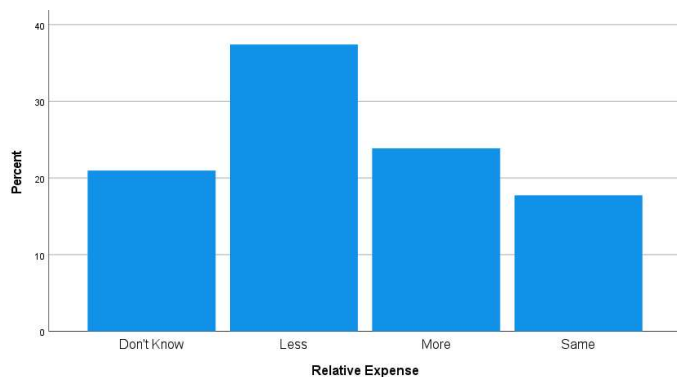


Figure 1.4: Solar's Expense Relative to Other Energy Sources

Of 245 respondents who felt knowledgeable enough to express an opinion on the topic of whether the state should increase, maintain, or decrease financial support for community solar programs, 67.9% of respondents indicated a desire to increase state funding, while 16.1% wanted to maintain state support at its current level, and 11.9% wanted to decrease state funding. This indicated a strong general trend in support of community solar and stronger pro-community solar policy.

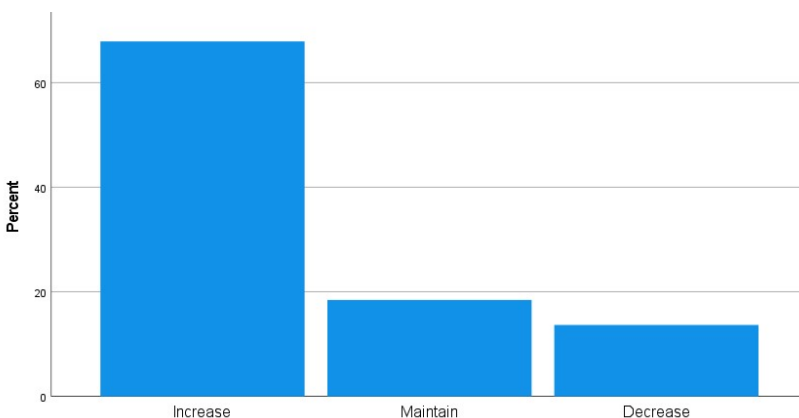


Figure 1.5: Opinions on How the State Should Modify Financial Support for Community Solar Projects

Respondents showed moderate interest in community solar projects, as indicated by the mean response score of 3.36. However, there was a great deal of variance in responses (standard deviation = 1.295), with the most common answer being three, or moderately interested.

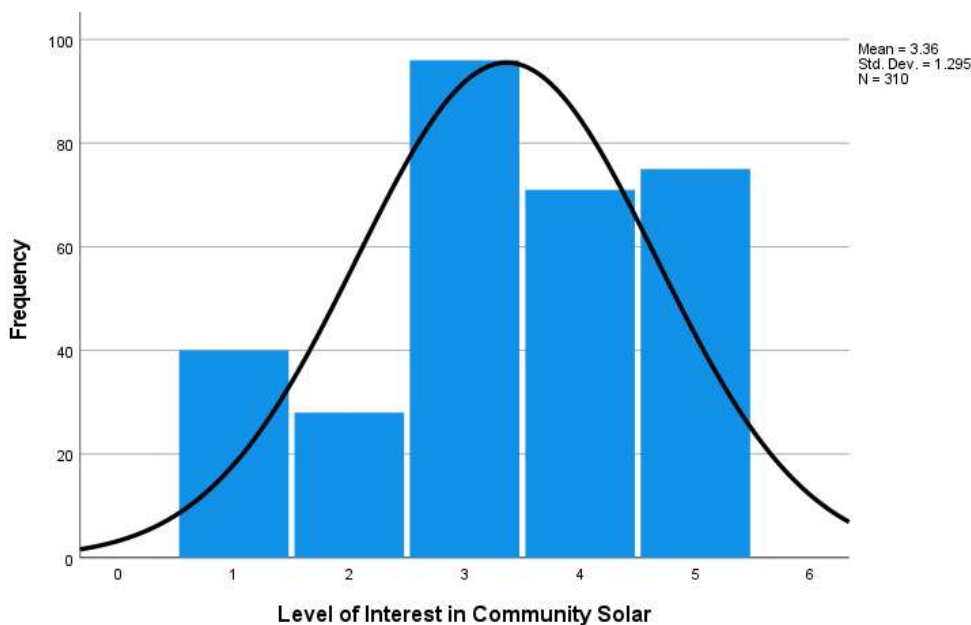


Figure 1.6: Level of Interest in Community Solar (1 is not interested at all, 5 is extremely interested)

Respondents indicated that there are several significant factors currently affecting interest in potentially joining a community solar program. Cost was the most prominent factor, with 59.2% of respondents listing it, followed by Lack of Information at 42.7%, Availability at 37.5%, Lack of Interest at 9.7% and Other at 10%. In general, these data bore out that respondents were more financially concerned than anything else, but still tended to desire community solar offerings, with 37.5% of respondents reporting that not having the option available was a major reason why they weren't already adopting it.

		Responses		Percent of Cases
		N	Percent	
Factors Affecting Willingness To Adopt <sup>a</sup>	Availability	116	23.6%	37.5%
	Cost	183	37.2%	59.2%
	Lack of Information	132	26.8%	42.7%
	Lack of Interest	30	6.1%	9.7%
	Other	31	6.3%	10.0%
Total		492	100.0%	159.2%

Figure 1.7: Factors Affecting Willingness to Adopt Community Solar

In general, respondents were slightly more likely to be financially rather than environmentally motivated but were also highly likely to support pro-community solar policy, have interest in buying solar energy if affordable, and have interest in learning more about or buying into community solar. The only place absent a strong trend was the sample population's lack of consensus on the relative expense of solar compared to other energy sources.

### Comparing Renter Status with Purchasing Motivations

To better understand whether renter status affected respondent sensitivity toward financial concerns, a chi square goodness of fit test showed a significant relationship between respondent renter status and their purchasing motivation, with renters being more than twice as likely to value financial reasons over environmental ones. Furthermore, renter respondents were 33% more likely than homeowners to value financial reasons over environmental ones.

$\chi^2_{(1, N=310)}=8.706, p=.003$ ).

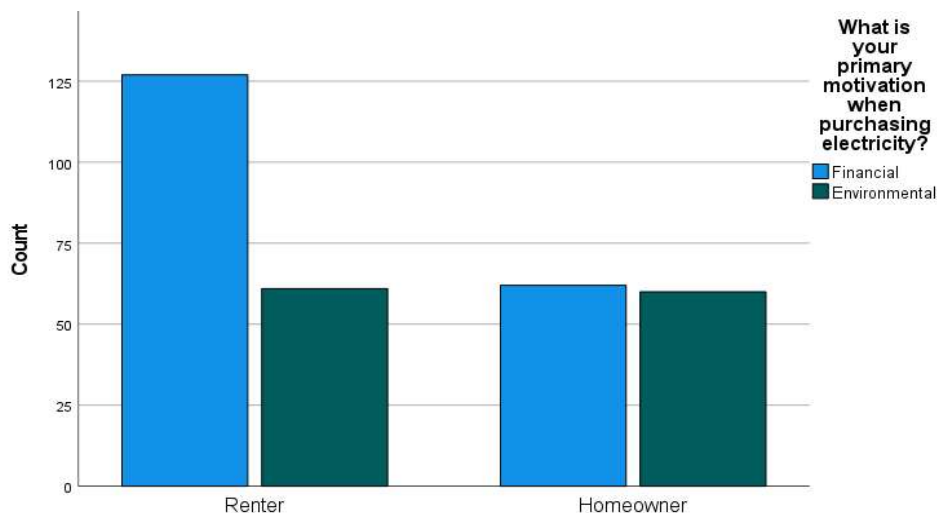


Figure 2: Renter vs Homeowner Energy Purchasing Motivation

### Renter Status / Relative Expense of Solar

There was no difference between renters and homeowners in their view of the relative expense of solar vs other types of energy ( $\chi^2_{(3, N=310)}=.048, p=.997$ ). The greatest fraction of both groups thought solar is cheaper than other forms of energy (which is accurate), with the next most common answers being that it was more expensive, followed by being unsure. This indicates a general lack of consensus the price of solar energy.

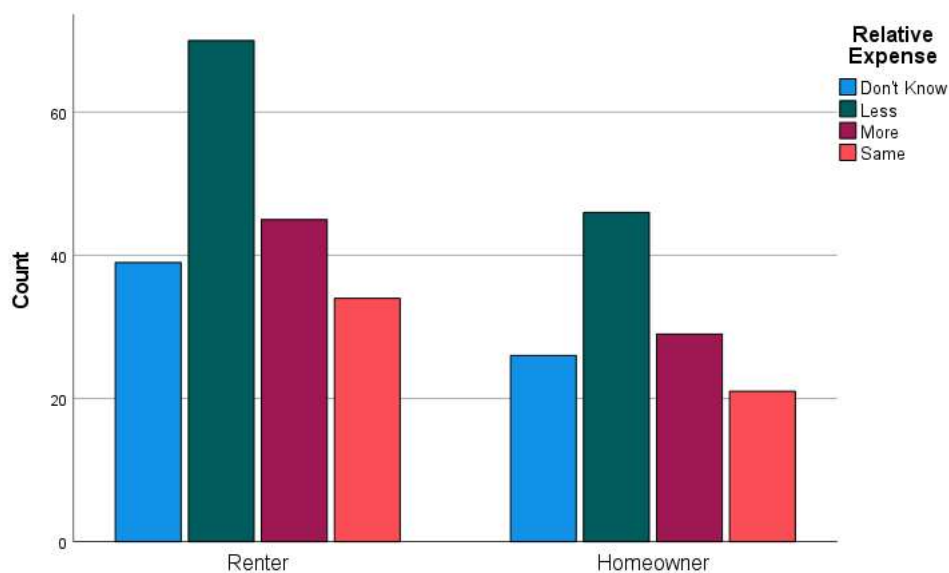


Figure 2.1: Renter vs Homeowner Views on Solar's Expense Relative to other forms of Energy

### Renter Status/ State Financial Support for Community Solar

Renter status did not seem to strongly impact their opinion on the need for state financial support for community solar. Although 8% more renters than homeowners indicated that they would like the state to increase financial support for community solar, that difference was not statistically significant ( $X^2(2, N=310)=1.021, p=.600$ ).

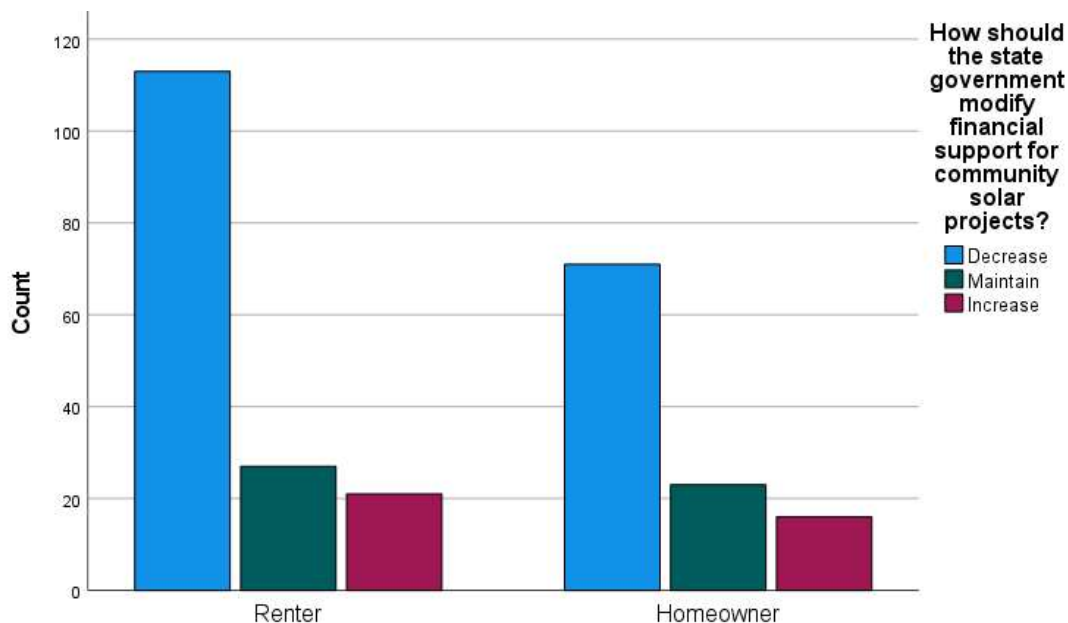


Figure 2.2: Renter vs Homeowner Views on State Financial Support for Community Solar

### Renter Status/ Interest in Community Solar

To discover whether renters were uniquely more interested in community solar than homeowners, a chi square test using renter status versus the level of interest in community solar was performed. However, this analysis showed no difference between respondent renter status and their level of interest in community solar, despite a higher number of responses at levels 3-5 (indicating moderate to high interest) ( $X^2_{(4, N=310)}=28.200, p=.600$ ). It is possible that the sample held insufficient power to detect a true difference in this case.

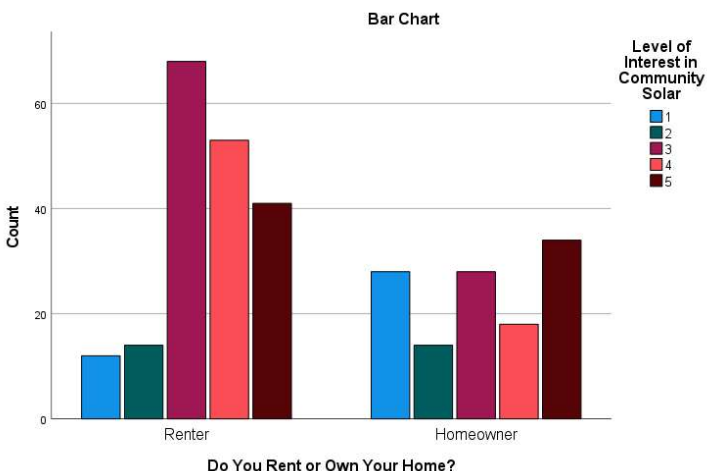


Figure 2.3: Renter vs Homeowner Level of Interest in Community Solar. Interest was registered on a Likert scale ranging from 1=Not Interested to 5=Very Interested.

### Renter Status/ Factors Affecting Willingness to Adopt Community Solar

Understanding the different factors that renters and homeowners factor into decisions required a crosstab to determine which factors influenced the groups differently. Both renters and homeowners were more likely to list availability, cost, and lack of information as factors affecting their decision to adopt community solar than to list lack of interest or another reason. However, renters specifically were also more likely than homeowners to cite cost, availability, and lack of information, while homeowners were more likely than renters to list lack of interest or other as factors.

Do You Rent or Own Your Home?		Factors Affecting Willingness To Adopt <sup>a</sup>					Total
		Availability	Cost	Lack of Information	Lack of Interest	Other	
Renter	Count	85	119	90	13	18	188
	% within Renter	45.2%	63.3%	47.9%	6.9%	9.6%	
	% within \$FACTORS	73.3%	65.0%	68.2%	43.3%	58.1%	
Homeowner	Count	31	64	42	17	13	121
	% within Renter	25.6%	52.9%	34.7%	14.0%	10.7%	

	% within \$FACTORS	26.7%	35.0%	31.8%	56.7%	41.9%	
Total	Count	116	183	132	30	31	309

Figure 2.4: Renter-Homeowner Distribution across Factors Affecting Community Solar Adoption

## SURVEY DISCUSSION

The survey of residents from Wenatchee, Yakima, and Kennewick, revealed that there is an untapped market for community solar in Eastern Washington cities. This finding was made clear by the high number of respondents, renters in particular who indicated that they were interested in buying solar energy if it came at an affordable price. Unsurprisingly, renters were more likely than homeowners to prioritize financial over environmental factors when purchasing solar, with financially motivated renters being twice as common as environmentally motivated renters, and cost being the most common concern that people listed when thinking about why or why not to buy into community solar projects. This means that to a substantial extent, energy decarbonization efforts centered around environmental pitches will be less effective at attracting renters than financial pitches. It also signals that to a certain extent; renters may not have the financial independence to be able to worry more about their individual carbon footprint than the costs of their immediate bills. This high level of financial motivation in the energy space signals that discussions around the future of the energy grid must be more than just discussions about decarbonization and the environment. As the issue is primarily financial to nearly 70% of respondents, solar and energy policy should always keep the financial consequences of diverse types of solar investments at the front of the discussion.

The survey also revealed that compared to homeowners, renters were far more likely to be interested in buying into a community solar operation, should one become available. This

specifically highlighted the vast potential for renewable energy adoption among the state's renter population, which is significantly larger than the homeowner population. Unfortunately, as earlier discussed, renters are largely excluded from the solar market due both to being low income and not owning their own roof. Although the renter population is enthusiastic about solar and community solar, there's no option to tap into that market under current state law surrounding solar energy and community solar policy. However, surprisingly high renter enthusiasm to adopt solar energy gives a strong, clear indicator that the biggest holdup to accelerating the energy decarbonization process within the residential sector is not from a lack of demand on the residential side, but from other factors such as a lack of political willpower to update legislation on the issue, leading to a severe regulatory bottleneck and maintaining a deeply carbonized status quo in the residential energy sector.

On the topic of legislation, survey respondents were also far more likely to support increasing financial support for community solar than any other option. This result indicates that despite years of costly solar incentives programs, most people, particularly renters, still believe the state should financially support the development of the solar industry generally, and the community solar industry specifically. As such legislators should remember that even in parts of the state that could potentially be seen as less positive toward renewable energy, support for promoting solar development is incredibly high, and that failing to attempt to support the fledgling industry in a healthy way would not just disappoint community solar advocates, but also likely a healthy majority of Washingtonians.

Finally, survey data revealed that understanding of the cost efficacy of solar energy has yet to reach a consensus, although the most common response was that solar energy is less expensive relative to other energy sources, which is accurate. Anecdotally, from administering

the survey, many respondents who thought it cost the same or more, often said that it was the upfront cost that made it more expensive, indicating that they were thinking of rooftop solar. The lack of uniformity of opinion, as well as the misconceptions surrounding the costs of community solar indicates the presence of an information deficit that needs to be addressed before community solar adoption can reach its full potential. As such, legislators, advocate groups and community solar operations should redouble their educational and outreach efforts to better connect the population to the issue and the technology.

Survey data revealed that although financial considerations remained extremely important in the eyes of renters in particular, renters and homeowners across the board were highly enthusiastic about adopting community solar. This enthusiasm came despite an information deficit and a regional power grid that already provided cheap and abundant hydroelectric energy. Finally, enthusiasm for buying solar energy and participating in community solar projects gave a powerful signal that whatever is limiting community solar operations from exploding across the state, it is certainly not a lack of consumer demand. As such, legislators should much more seriously consider what else could be holding the market back, whether legislative action could jumpstart the market, and whether continuing to put community solar policy at the back of the priority list will be beneficial or harmful to the long-term healthy development of the state's economy.

## **DATA COLLECTION - QUALITATIVE INTERVIEWS**

To better understand motivations of legislators and key proponents for formulating solar energy policy, the study employed an elite interview approach. Here, it gathered convenience-based qualitative data from interviews with seven state legislators who sit on one of the two

state legislative energy committees, and one community solar professional to analyze the political, social and economic salience of community solar programs within the state. This approach built an understanding of the opportunities and obstacles facing community solar's adoption and use as a tool for a more prosperous and equitable society, specifically from the legislator perspective. This facilitated the development of new insights into the potential role for community solar within the state's future economy. Interviewees were recruited by reaching out to relevant state policymakers through LinkedIn and email to request a 15-30 minute interview on the state of solar policy, and more specifically the state of community solar policy in Washington. An interview protocol consisting of seven open-ended questions was used to guide the discussion (see Appendix Two), but most interviews only addressed parts of the protocol due to time constraints. Interview protocol questions sought opinions on the current state of solar energy policy, whether interviewees saw solar as an environmental or a financial asset, how state energy committees crafted energy policy, as well as the current status of community solar policy, and how interviewees thought community solar deployment would unfold in the future (See Appendix Two). Interviews were recorded for ease of transcription, and the data were aggregated to maintain anonymity.

## **LIMITATIONS**

The interview section was designed to gauge the state of opinion among highly engaged stakeholders such as policymakers on energy committees, community solar professionals and advocates and other energy professionals. However, the interview sample was convenience-based, which limited it only to policymakers who felt like participating in a community solar study. The interview policymaker sample consisted almost entirely of democratic lawmakers, with only one republican policymaker offering their opinions, and this almost certainly skewed

the interview themes. Furthermore, the non-policymaker stakeholder group was entirely represented by one community solar professional, no one from the rooftop solar industry, and no electric utility professionals. This also biased responses, and may have limited the general applicability of the interview themes.

## **INTERVIEW – RESULTS**

### **THEMES FROM INTERVIEWS**

Interviews with eight knowledgeable stakeholders including seven state legislators and one community solar industry professional revealed several strong themes including community solar's use as a tool for economic empowerment, the role of virtual net metering in effective community solar policy, major utility opposition to community solar legislation, and even how to address educational deficits and why it's important. Finally, policymakers highlighted the importance of a multifaceted environmental strategy that incorporated effective community solar policy alongside a slew of other energy and other non-energy policy options. Policymakers were in general supportive of community solar to varying degrees, and all suggested that the state should have a more robust policy addressing the sector.

#### **THEME 1: Community Solar's Use For Economic Empowerment: "It's literally a way to pull people out of poverty"**

Several speakers saw community solar not just as a tool to reach 100% clean energy, but as an economic asset that could help LMI Washingtonians break free from financial hardship. Speaking about monthly energy burdens, the disproportionate impact that energy costs have on people in poorly insulated housing, and the idea that \$100 per month meant different things to people from different income brackets, these speakers highlighted community solar's untapped potential as a tool for low-income economic empowerment.

*“I do think we need to be cognizant that as the cost of solar per kwh comes down, more people will want to invest in it as a business. We want to make sure that doesn't squeeze out the energy users who could benefit from having their electric bill reduced, their energy costs reduced.”*

*“Not everyone has a roof they own, or sunlight on said roof. Not everyone has \$30k up front to do that, but what if I could just put \$5k of capital onto a community solar grid, and I could get the benefit of that. It just seems like there's so much unmet need for folks that don't qualify for services. One of the things I'm really passionate about, having been in this situation myself, you make one dollar over the line and now you don't qualify for anything, like 'good luck you're on your own' and you don't get energy assistance, you don't get any kind of loan help, there's all these things you don't qualify for. And not to say that low-income folks are able to take advantage of these, because for many of them it's just outside their band width and they don't have time or energy to dedicate. To be able to open it up to folks who wouldn't ordinarily be able to capitalize on it themselves. People who live in apartments, there's so many reasons why community solar makes sense, not the least of which is in order for the utilities to comply with CETA, they need to diversify their grid, so I see this as value added both from the utility transmission side and from the local ratepayer side, in addition to climate goals.”*

*“Energy burden is the percentage of someone's annual income that they spend on energy. The lower income you get, usually the higher your energy burden is. We also know that low income people are more likely to live in less efficient homes and less insulated homes and use more energy... lowering someone's energy burden, energy is usually their second highest cost after rent, or groceries, sometimes it's the third highest. Really it's not only an issue of, 'hey can you access this cool new technology that will reduce your bill', it's literally a way to pull people out of poverty.”*

*“The idea is that energy costs are going to change, but low-income people are always going to suffer the consequences of those changes in a way that people that many people, especially that I work with at the legislature, they have no idea. They have no idea what it's like to know that \$100 per month change in your bill is enough to make it so you keep your place or not, or pay your phone bill or not, or buy groceries or not. So part of it is socializing how dire it is for people out there, but also to take real responsibility. If we're going to fix the climate, they need to be able to participate, and we're just pushing them to a place where we're just making things more and more and more expensive. So I think it's a moral imperative, it's a planet imperative. If our problem statement is how are we going to get humanity to survive while our climate is changing, then this is one of those keystone things that we need to equip people with on an individual basis.”*

*“Really keeping in mind, especially now coming out of the pandemic, how screwed people's credit is right now. A lot of people have some really screwed up credit, and poor people are always going to struggle with that even harder, because you get that one late payment and it keeps ratcheting down your credit score. Then how do they get access to capital to do these kinds of projects? So part of what I'm trying to sort out is, back to my earlier statement about how to*

*get low income folks enfranchised, is rich people can do whatever they want! They have solar, they have their Tesla, they're patting themselves on the back about how great it is to be green, and the rest of us are driving our Nissan Quest, you know? We're not getting there at quite the same pace. So I think some of these problem statements are less about 'How do we deploy community solar?' and more about 'how do we get credit and banking opportunities out there for folks in a way that they can actually take advantage of it, and dealing with the renter-owner piece is a significant component of that challenge.'*

Legislators were not universally convinced of the idea that community solar could be a big financial asset for low income households. Several legislators couched their support in community solar in the notion that it would help the grid decarbonize, rather than supporting it for its financial benefits, and some voices were skeptical that the financial benefits even existed.

*"I think a lot of people do want to buy into CS. As a renter you want control, and it's very frustrating when you don't have that control, and you see others buying into solar projects and electric cars, and it's harder if you don't know where you're going to live in two years. So I think it would be valuable to have that as an option and a way to fund more solar projects."*

*"I think it would be valuable to have that as an option and a way to fund more solar projects. I don't know if it's going to be transformative or not, I'll be honest there. We should be allowing it."*

*"The community solar piece, which I gather is part of your interest... I don't know that we've ever proved that that works real real well."*

## **THEME 2: Virtual Net Metering is critical to community solar's success. "There is one policy that would blow this thing up"**

The idea that requiring utilities to offer virtual net metering services to community solar projects would unlock the community solar market was particularly resonant among many of those interviewed. Citing the size of the renter population, the benefits of creating a two-way electric grid, and the benefits of realizing community solar profits through the electric, interviewees nearly universally concurred that virtual net metering and on-bill crediting mechanisms were particularly key to expanding community solar on a large scale.

*“There is one policy that would blow this thing up, and we would get a ton of opportunity if we could make it work. And that’s virtual net metering. So right now, if I put a solar panel on the roof of my single family house, I get to produce electricity, and when I use it, it just goes straight into my appliances. When I’m not using it, my meter spins backwards. And later that evening, or next winter when I’m using more than I’m producing, I’m just getting caught up, and I essentially have a credit that I can build up, and in Washington State we get these 16 hours of beautiful sun right when we’re outside and no one’s using electricity, or using much less, we build up a huge credit. I had solar panels on my house, and that’s how it works. You finish burning up your credit in march, you pay an electric bill in April, and the panels are producing again. So you pay one month out of the year. If you wanted to do that, see now I live in a condo, and so my condo association will never sign off on putting solar panels on this very old, very unfortunate roof situation. So if I wanted to buy into a similar deal, ideally I would be able to invest say \$10k, buy a piece of some solar panels, and then I will get a credit on my electricity bill, and that credit can be burned throughout the year.*

*“long story short, we aren’t able to build projects that provide people with tangible financial benefits unless it’s restricted to a very small group of wealthy people, and that’s just how the investment laws work. If we had a bill credit, we’d be putting electric credits directly on customers bills, and it wouldn’t be an investment, people would literally just be saving money on their bill so it’d be a different financial story, so that’s our biggest barrier right now, utilities are not required to work with us to provide community solar credits onto customers bills”*

*“Part of the ongoing policywork I’ve done is done is around the concept of on-bill financing. Meaning, if you wanted to get new windows and doors, or you need insulation, or you want to do a heat pump instead of a gas furnace for example. That instead of having to take out a separate loan, this one would just run with the meter, and you would pay it as part of your utility bill, and it doesn’t require the same loan capitalization credit check, so that’s the ongoing work that I’m doing around expanding access to folks, and ultimately trying to figure out how to, I’d love to scale that up to community solar as well, that you could on-bill for community solar.”*

*“One of the stickiest wickets with the utilities has been the net aggregate metering piece. So if we can figure out how to thread that needle, they’re going to be a lot more open to that discussion. So there’s the net aggregate metering part, which just really sticks in their craw and they’re not sure how to deal with it.”*

Some speakers focused less on virtual net metering itself, and more on what a community solar market would look like if such a policy innovation were used. These quotes from a policymaker and the community solar professional touch on what virtual net metering does to the broader energy grid structure, as well as community solar’s economic potential in Washington.

*“Have you read about the first community solar project? In New York where they just made a big wind turbine on top of an apartment. That was part of the big change in the law that allowed for some of the decentralization of our utility system... It was a group of people in alphabet city in New York who refurbished a building, made it super energy efficient, put a wind turbine on top and kind of doing it illegally and turning their meter backwards, until they got sued by the utility, because the utility has monopoly power, which there’s reasons for why they have that monopoly power, so that experience led to some of the legal innovations at the federal level that even allowed for energy companies to plug in this way. Because when we started this, the power plant provides energy to people and makes all the decisions of where the plants are. And there was never that discussion of ‘can we feed back the other way. So that was part of that policy innovation.”*

*“I’ll say that this next session is our best chance so far, because we have a bill now, we have feedback to that bill from the utilities. Since we were working on it last year, New Mexico passed a new virtual net metering policy, and their bill was pretty good... If we could have an estimate for the amount of people who couldn’t access rooftop solar, that’s our market potential. Even the people who can access rooftop solar, some of them won’t want it, so that’s another market potential. If we had a number of say, how many millions of customers the community solar market could serve. Our last estimate when we did rough math to figure it out, we estimated that the community solar market in Washington was five to six times larger than the rooftop solar market. That’s just because there are way more renters than homeowners, there are way more across the board.”*

**THEME 3: A Powerful Utility Lobby Opposes Virtual Net Metering and to a lesser degree, Community Solar “[The utilities] were a very big player, a very big voice in the conversation”**

Another strong point of agreement was that out of all the stakeholders in the community solar process, and the energy process in general, the electric utilities usually held the most lobbying influence. Identifying the utilities as generally opposed to virtual net metering for non-utility projects, interviewees offered several possible explanations. The community solar professional’s assessment was frank and spoke to what they saw as utility motivations as did one a policymaker.

*“Another reason it hasn’t happened is the utilities. Utilities want to own and operate community solar products. For example my utility here in Olympia is PSE, and they’re launching their own CS program later this year. They’ll be selling subscriptions to customers and providing them with credits on their energy bill, doing virtual net metering. And they can do that. Under state law, it’s totally legal for them to do that. The consumer protection requirements that apply to us as a CS company do not apply to the utility. So they can offer the product at a premium to their*

*customers themselves. When a group like ours or a church or a community group or a nonprofit goes to them and says 'hey, we'd like to host or develop a community solar project. Will you provide a service of crediting our customers bills kinda similar to net metering, they can just say no and turn them away. And that's what they do every time we ask. And we've asked a couple times now. And so what our policy does, it doesn't require them to do something they're not already doing, it just requires them to allow third parties to compete with what they're doing. So, if you had a monopoly, would you let someone come and compete with you? Hell no, no you would not. So they fight us every inch of the way. Last year, that opposition killed our bill"*

*"The utilities have always been slow to change. They operate these multi billion dollar, multi jurisdictional, multi-state command systems. They already have to comply with CETA, they have a lot of aged infrastructure that they're having a hard time getting permits to upgrade. And then we also want them to do this. So I think part of it is parsing out how much they can absorb at any one time considering how many restrictions and regulations were just placed on them. I am trying to take the tack with the on-bill financing, because they don't like that either, of figuring out how to get the UTC to step in and mandate some of these things, or we can make the UTC tell them they have to do it. The universal element that makes it challenging to work with the utilities sometimes, is this is not a partisan issue, this is something that affects everybody across the state, so it is really really easy for them to kill bills, especially if it's something that they don't like or want to do. That's not to say that they're some evil empire, but they don't really have a reason for them to get on board per se. But that's why I'm hoping that CETA and compliance with CETA can open some of this up, because ultimately, they need to reduce the amount of energy they're putting into the grid over time, even as we continue to grow, because we need to save that energy on a household by household basis to be able to help them have that conveyance. Because we're down 2% on hydropower, we're not letting any more coal in, and natural gas is starting to come out. So how are we generating this? Because we're not getting our solar and wind projects up fast enough to back fill that.*

Most policymakers focused on the effect of the utilities opposition rather than the causes and potential motivations for it. These speakers more accepted it as a fact of life and spoke about how their opposition affected the policy discussion in committee talks.

*"Unfortunately, the utilities don't want [virtual net metering]. It's not allowed under state law. Unfortunately if I want to buy \$10k worth of something that has a financial value, and they're going to pay me the cash value for that product, that then falls under Securities and Exchange law, and it's taxable, like that's taxable income. And so I immediately lose a third of the value because now we add that to my tax bill, to my income for the purposes of taxation. And it runs into a whole bunch of rules over how community solar can be marketed. So if a small non profit wants to put together a community solar project and sell 100 shares to community members, they have to go through a ton of rigamarole, and all kinds of disclosure and performance statements and those kinds of things... If instead of getting a check from the community solar project, they were getting a credit on their electricity bill, it avoids all that."*

*“we also would hear from the utilities quite a bit. They would talk about how they were including solar into their portfolios, and talk about the difficulties, the upfront cost, the generation and the dollars and cents part of it. So they were a very big player, a very big voice in the conversation.”*

*I saw you had questions about the community solar project. That bill keeps, I’ve never run that bill, and I’ve never sat down with it’s prime sponsors. Beth Doglio ran it before, and it was Jessica Bateman’s bill. It never gets very far and I don’t know why, so tell me what you think. But my guess is the utilities don’t like it because they’re worried they’ll have to pay the solar manufacturers or the community solar operators. They really don’t like net metering if it doesn’t benefit them. Which makes sense because if you’re making money on net metering it ends up being a subsidy for you who bought into this project, and all the other ratepayers have to pay for it. So I can see people feeling a sense of injustice. I mean, there’s a fair price on net metering, but the fight is on whether the fair price is \$.06 or \$.07, right? Is it the retail price of electricity, which probably isn’t the fair price to be honest, because you also have to pay for the infrastructure, but how much lower is it? And that’s a really fraught discussion, there’s a lot of economics, a lot of technical stuff, a lot of value-based judgment on that as well.”*

*“And then there’s the lobbyists. You know what the lobbyists call themselves right? The Third House. Yeah.”*

#### **THEME 4: Education and Outreach are Critical Tools in Accelerating Community Solar Adoption. “We need to keep educating”:**

Several speakers indicated a general lack of education and understanding surrounding the topic of solar energy among the general public, particularly for the case of community solar energy. These speakers indicated that one of the best ways to drive more solar adoption was to provide stronger educational supports for Washingtonians to learn about solar and their own energy profile.

*“I don’t think a lot of people individually understand [community solar], and I remember even when I understood it I would have to keep reminding myself exactly what I learned. It would be helpful for people to understand the current state of energy policy and how it works, and then what that would look like for them in terms of the grid and all that. So I always think education and transparency around this information is helpful.”*

*“Another reason is education, pure and simple. It’s not the easiest subject to grasp, especially when you start talking about bill credits and utility agreements, people’s eyes just glaze over. So that’s been a challenge, and something our team is doing to address that is we’re treating our bill, our policy proposal as an educational tool.”*

*“And I think education is important because the sun only shines a few months out of the year in our part of the world, so knowing that you can still get energy from the sun even when it’s cloudy, that was my first lesson in solar. So yeah, I think we just need to keep educating, keep incentivizing, keep figuring out what to do with the solar panels end of life.”*

Two policymakers also suggested that not just education, but consultation were important elements of driving forward acceptance of community solar, and that local stake in the project with outreach done by local groups would be particularly effective in getting people on board.

*“I think wind turbines are beautiful, but I love green energy so I get excited about it. I think they’re mesmerizing. But you’d feel differently depending on what your financial stake in that is, and if you were consulted. Like that’s one thing I’ve found. one of the funny things about this job is, I can say Sam I’m gonna buy you this new garage and if I asked you about it beforehand, you’d be like, “yeah!” but if you found out the city was going to place it on you, you’d be so mad about it. So there’s that element of consultation as well, that people need to feel like they’re a part of it.”*

*“I know that for the community projects, a lot of it is how to reach those folks and let them know that this is even an option. That part too, the state is not great at that. That’s like hyper-local work that has to happen to reach people... That outreach is all local work. Then I’m thinking, who are the community groups that folks trust? How are those dollars flowing, how are those resources happening. And the state, we’re just too removed from what the local level infrastructure looks like. So I think there’s a lot that needs to be built there. How are we working collaboratively at the state level with the local folks that are going to be administering these programs and getting local control. Because you know this looks really different whether you’re in Spokane County or King County.”*

#### **THEME 5: Effective Energy Policy Requires an array of different policy options beyond just community solar. “it’s an all hands on deck situation”**

Interviewees were also quick to point out that community solar, and solar policy in general were but parts of the overall effort to fight climate change and build a better functioning economy. These ideas generally echoed the “all of the above” principle discussed earlier in the study, and spoke of the need to incorporate many policies in an interwoven, mutually supportive framework, including community solar policy.

*“One of the myopic things we do around climate change is think that one solution is going fix all our problems. I think particularly in the energy and renewable and transmission*

*space, it's an all hands on deck, I don't see any reason why those concepts are mutually exclusive. But for me, the point is to be able to open up the opportunity to allow folks to have solar without having to have the physical place to put it. I think that's just really important. I have a really great roofline if I cut down the trees next to my house. I don't want to do that, but would I love to build it on a grid where someone else has? It just makes a lot of sense. I see it as needing to go hand in hand with a lot of the envelope projects like insulation and windows and doors and that sort of thing. I think it needs to be coupled with that sort of commensurate effort to keep the energy costs low, because it doesn't make hardly any difference to generate your own energy when you're blasting it out by not doing a good job of stewardship in your own home."*

*"This whole energy policy piece... Solar is right at the cusp of cost effective. It is not yet a complete match, and won't ever be a complete match for when we need electricity, right? So we need to ramp solar, absolutely to hit our carbon targets, we've got to build that up. But we also have these other pieces that really need to be part of it. So some of that is the value of not just solar, but distributed solar, so it's in the places it's being used, so you're missing less in line losses etc. But also we just gotta pair it with battery storage, or some other type of storage. In the future we'll probably need to be producing hydrogen, or other kinds of chemical energy storages, that can then be coupled with even more solar so that we can turn it back into electricity at night. And transmission too. Transmitting electricity from where it is being produced in the winter, ultimately the western grid needs to get a bit better connected so we can get solar production from places like Arizona, and we can sell them some wind power back later on. So that transmission is going to be a big part of the fight to expand solar too... And on the distribution vs transmission question, the answer is both. It has to be."*

*"I really don't know. Like, I'm a politician I guess, so I think it would be a bit of both, right? I mean people like knowing their energy is green, they might like looking at their solar panels, but it's also the financial aspect as well. People like being able to talk about green energy, like I have a heat pump, and I talk about it all the time on FB, I think it's ridiculous that we're not pushing more heat pumps right now, but I talk about it as something that saves me money, gives me AC in the summer, protects me from bad air during the fires, but also it's a cool green energy solution that replaced our natural gas. So it's all of these things. You look at an apple, and it's the deliciousness of the apple, the freshness of the apple, whether you knew your farmer, the organic attributes, etc. You can separate those, but I don't know how to separate those without really studying it."*

*"We have mandates on 100% clean energy with CETA. So we've gotta move to these which will be hydro, which will probably be our baseload. There's also solar and wind. It's not just solar though, it's also building out the transmission lines. It's ensuring we have the right prices in place. As we see expected increases in loads from switching to electric vehicles, we'll be looking at that. Not so much in the subsidies for rooftop solars. At some point that's gotta be cost effective on its own, and we have the mandate to make sure that we're getting those out"*

**INTERVIEWS DISCUSSION:**

The interviews revealed that community solar's potential is currently limited by state regulations that force community solar operations to realize financial benefits outside of the electric utility system, which causes the asset to be regulated like a security, taxing the investment, reducing the overall financial benefit to customers, and complicating project financing.

The interviews also indicated that implementing a virtual net metering policy akin to those from other states had the potential to unlock a new level of solar energy adoption by engaging groups who are traditionally excluded from accessing the benefits of technological breakthroughs. Some legislators signalled skepticism at the benefits that community solar advocates promised, viewing previous state policy as a regressive giveaway not having appetite for more expensive rooftop solar incentives like in the past. Others saw more potential for community solar's application as a tool to reduce the energy burden on low-income renters whose individual energy burden tends to be three times higher than individual energy burdens from other households (Ballard, 2014; Department of Energy, 2019; Drehobl, 2020). As of 2018, Washington renters have relatively low energy burdens compared to other states, but it still takes roughly 5% of their income, which can make all the difference between saving money every month and falling behind on monthly rent payments. Financially empowering renters is a singularly powerful policy tool because renter demographics are largely comprised of economically marginalized population groups. Data from 2016 shows that renters tend to be young, with 65% of renters being under the age of 35. Furthermore, more than half of black and hispanic household heads rent their home (Cilluffo, 2020), indicating that empowering renters in a very real sense can help address long-standing social and environmental justice grievances

within those communities. As community solar is currently bottlenecked by legislative inaction on virtual net metering, and outright production caps on what is supposed to be a highly desirable decarbonization assets, one could argue that current solar policy exacerbates not only economic, but also racial and age inequality by actively barring huge swathes of young people, less educated people, and people of color from investing in a financially lucrative technology that wealthier, older, more predominantly white populations can access. Given the United States ongoing reckoning with its history of systematic racial inequality, and the fact that the share of U.S. wealth held by people under 40 has decreased from 13% in 1989 to 5% in 2019 (Ivanova, 2019), one could expect that if legislators want to reduce the economic burden on these most vulnerable of populations, they will prioritize virtual net metering legislation to allow non-utility groups to participate in the energy system. Even if individuals who buy into community solar don't get rich off their savings, the evidence seems incontrovertible that it would support low-income and marginalized populations, mitigate a contributing factor to socio-economic inequality, and jumpstart the process to decarbonize the residential sector.

Policymakers were somewhat divided on the overall impact of community solar, but they had wide agreement that its prospects would be much better if the state passed a virtual net metering policy that allowed renters to credit solar electricity credits directly to their power bill instead of having to receive benefits in the form of taxable income, which neuters the power of the distributed solar program (NREL, 2021). Some interviewees saw virtual net metering as a way to access a much larger solar market comprised of renters and homeowners who didn't want to pay the up-front costs of rooftop solar. Although as yet not clearly specified, the community solar potential market is significantly larger than the rooftop solar market for the simple reason that it has a much lower barrier to entry, and can provide benefits for small-dollar investors,

something that is simply impossible with rooftop solar or utility-owned solar projects. As most speakers concurred, the fastest way to begin accessing this market is by passing a virtual net metering policy allowing low-income buyers to benefit from the same state support that wealthy buyers currently enjoy. This is a uniquely important policy to pass, as its absence from the WAC is likely the single largest factor affecting community solar's adoption within the state, as state policies toward community solar sectors tend to dramatically affect the decisionmaking approaches that community solar projects take (Hargreaves, 2020).

Some speakers were more concerned by the policy's impact on the price of solar energy and the equity ramifications of passing policies with the potential to shift costs onto non-participating ratepayers, while others more explicitly saw virtual net metering and community solar as a way to economically empower Washingtonians who feel the bite of the rising prices for essential goods such as rent, electricity, food and water more strongly each year. It's true that the policy of net metering compensates individual solar producers at a higher rate than their energy is most likely worth, as it compensates individual generators at the retail power rate that electric utilities get compensated at, even though those individual generators don't have to pay the grid transmission and maintenance costs that utility providers do. This form of compensation can result in inefficiencies that are doubly problematic when state compensation goes primarily to wealthy homeowners who don't need the support, even if the incentive may be important to encourage adoption of residential solar, given its high up front costs. The question of net metering's economic efficiency becomes considerably less potent when discussing its value in a community solar project. It remains true that virtual net metering, depending on the specific price, could end up compensating participants for more than the energy they "produced" was actually worth. However, the question of economic efficiency could potentially lose importance

due to the wider solar adoption the policy encourages, as well as the fact that the population the policy compensates will be primarily renters and low-income homeowners, a group that needs the support far more than wealthy homeowners. Furthermore, the question of net metering's efficiency is only salient so long as the analysis excludes the social cost of carbon from the cost of sticking with a traditional power arrangement, a familiar but fundamentally flawed way that traditional cost-benefit analyses sometimes view questions of efficiency.

Although virtual net metering and community solar may suffer from similar problems to traditional net metering arrangements, their much stronger positive impact on low-income populations that are far more likely to need the boost not only justifies the policy, but also forces Washington to consider why it's subsidizing solar for wealthy homeowners, but not for low-income people, who still pay energy bills and suffer a much higher energy burden than the ones who are currently being subsidized. Given the ever decreasing nature of marginal utility from extra units of dollars, it's reasonable to conclude that even assuming that virtual net metering is just as inefficient as traditional net metering, it would be more economically efficient to provide virtual net metering than it's rooftop counterpart because it would distribute the generous compensation to a population that values each dollar unit higher than their high-income counterparts.

Interestingly, legislators seemed to agree with the notion that effective energy policy required a myriad of separate solar strategies to all be employed together in a team effort. The part that most failed to mention was that community policy solar currently plays either no role, or a counterproductive role in that effort, as existing policy financially handicaps non-utility community solar operations, and institutes a hard cap of one megawatt on the amount of energy a community solar array can produce. This indicates that while legislators intuitively understand

the ‘all of the above’ principle, they may not be applying the spirit of that principle when considering whether or not to take action on community solar policy options.

Finally, several interviewees independently expressed the need for stronger education and outreach efforts within and around the solar space in general and the community solar space specifically, citing their own knowledge gaps and the willingness of people to participate if only they had more information to act on. Feeling that many within the state had little awareness of the solar market, several voices saw further education as the best way to begin moving adoption forward, by convincing hearts and minds. Although this was only part of their overall wish list, the educational deficit remained at the forefront of many speakers minds.

The course of 8 interviews revealed that while many state lawmakers are supportive of increased investments in solar energy, they’re not entirely ready to enter a new format such as community solar, especially under the current rules. Admittedly, as a policymaker it can be difficult to get community solar in the position where the policy is effective without actually changing the policy from its original outdated state. Until lawmakers pass a workable net metering bill, their concerns around the state of community solar remain salient. Therefore, millions of low-income customers who could see moderate, but perhaps decisive reductions in their electric bill through community solar, will have to wait until legislators decide that non-utility controlled community solar is worth allowing within the state.

## **SURVEY-INTERVIEW COMPARISON**

There were several points of commonality between the survey and the interview results, perhaps the strongest parallel being the lack of knowledge about current solar technology options. Many survey respondents admitted to not knowing much about solar energy, community

solar and the energy market in general, and several interviewees spoke to this reality. This confirms the idea that lack of information and knowledge remain a difficult barrier that community solar projects must overcome in the future. Fortunately for the embryonic industry, solar adoption is so low across the state that there is still plenty of demand to be tapped even in a low-information environment.

There was a strong difference in understanding about the need for financial incentives between the interviewees, and the surveyed renter community. Renters seemed to see more of a potential financial benefit in community solar projects that they ranked as quite important, while some of the lawmakers exhibited cautious skepticism that energy savings from buying into community solar would be important to renters, doubting that this would provide large contributions to the energy consumer's finances. This point of view contrasted with the majority opinion of survey renter respondents, who were consistently more positively disposed to adopting community solar themselves. Here it is good to remember that renters were more than twice as likely to be financially rather than environmentally motivated, even as legislators seemed to view the problem more as an environmental one than a socio-economic one. This did not make the environmentally oriented policymakers wrong, simply that their spoken views on what solar meant contrasted with renters who tended to view it in more directly financial terms. The gap in expectations for community solar's prospects between legislators and survey respondents indicated that to a certain extent, lawmakers' opinions on community solar could be out of step with those of rank and file Washingtonians, and especially Washingtonian renters. This incongruity should be revisited and understood more deeply before lawmakers fall too far out of step with renter constituents, who again happen to primarily consist of traditionally

marginalized groups such as those with less formal education, communities of color, young people and the poor.

The potential of community solar to be transformational for the budgets of LMI Washingtonians was a point of disagreement among interviewed lawmakers, some of whom saw it as a way to help people break the cycle of poverty. These responses more closely tracked with survey data that clearly showed strong desire to buy into community solar by a very cost-conscious population. This meant that although there was some distance between the legislative perspective and the reality on the ground, lawmakers are making the argument for community solar as a tool to economically empower low-income people. Although this has not reached consensus at the legislative level, it has become a somewhat more prominent feature of the debate. While the chasm between lawmaker and renter perspectives definitely exists on this issue, it appears that at least some lawmakers are articulating arguments from the low-income renter perspective in policy discussions.

Despite several interviewees having more of an arms-length guarded opinion on community solar, many spoke about the potential for virtual net metering to crack open the community solar market, if only electric utilities weren't so opposed to this option. By comparison, survey respondents strongly indicated their desire to see more supporting policy for community solar development, including direct financial support. The sheer number of respondents who wanted more state support for community solar indicated that while legislators may have balked in the past at community solar bills due to a dominant utility lobbying presence in opposition, survey data indicate that such policies may have strong support among their constituents, even if those constituents didn't voice those concerns or have any knowledge of the discussion within the legislature. The survey data makes it clear that most residents across the

state want to see more legislative support for community solar programs, and it may be important for legislators to understand emphasize constituent wishes rather than prioritizing utility concerns on such an issue. As such, to continue to do nothing to address the legislative bottleneck suppressing community solar is at best problematic, and at worst a betrayal of the clear majority of constituents wishes.

In general, lawmakers tended to view the problem from a more systematic, detail-oriented grid capacity perspective that prioritized working with utilities to craft policies that did not force the utilities to change too fast, while still meeting decarbonization goals. Survey respondents viewed the problem as more of an immediate cost, informational and product availability problem. It's clear that although low-income testimony has made it into policy committee hearings on community solar bills, their priorities, based in a desire for financial independence, simply do not carry the same weight in policy discussions as those of utilities who prioritize grid stability, price stability, and maintaining the traditional power grid setup. Until marginalized voices gain more traction in energy policy committees, it seems unlikely that effective community solar policy will be implemented, and solar will realize its hidden potential as a tool for economic empowerment and socio-economic justice.

There were several points of agreement between survey and interview data, and in general, lawmakers seem to be convinced of community solar's potential in the right policy environment. Of concern to community solar advocates is the fact that several legislators expressed doubts that community solar would help low-income people, but even those who expressed doubts said that community solar should be allowed within the state via a virtual net metering policy. On its face, lawmakers appeared to agree with survey respondents that more should be done to support community solar. However, internal disagreements over the efficacy

of community solar and virtual net metering policy indicate that actually passing a policy may prove elusive. The question that follows from this study is not whether policymakers think stronger community solar policies such as virtual net metering are a good idea, but how much political will lawmakers will actually have to enact such policies in the next session.

## **CONCLUSION**

All policies should be pursued to one extent or another in mutual support of the objective to quickly decarbonize the electric grid in a way that is just to all involved in the transition. Community solar is already part of many state's efforts to both decarbonize their residential grids and uplift their financially strapped populations, and must be part of Washington's push to decarbonize and begin to reduce its ever-worsening track record on income inequality. Virtual net metering is not a new policy, and many states have already implemented it in support of their now-burgeoning community solar industries, the most recent being New Mexico on April 6, 2021 (Gonzalez, 2021). Additionally, direct incentive and carve out policies have proven to be effective means of distributing the benefits of solar technology to low and middle income electric customers in the states that implemented them. For all the stakeholder groups that could be hurt by a community solar policy with a strong low and middle income support component, that harm is likely to be far exceeded by the harm of excluding people from a cost-saving, economically empowering technology for the simple reason that they don't have enough money to pay utility premiums for a limited project. These policies aim to begin improving the state's socio-economic divide, and continuing to ignore them simply adds to the state's ongoing legacy of regressive economic policy.

Furthermore, it has already been proven that community solar is effective at scale, as Minnesota, a non-sunny state, has already installed nearly a gigawatt of community solar

capacity as of May 2021 (Farrell, 2021). As such, the issue is not whether implementing community solar through virtual net metering is effective, but whether there exists requisite political willpower in Washington State to pass the policy, and requisite product demand to support the industry's ongoing development.

The Eastern Washington survey, although limited to three communities, revealed a large amount of community support, indicating that many potential customers exist, and one could reasonably assume that similar demand would exist in Western Washington. Although the surveys were not extensive across the state, they strongly suggest that far more demand exists than what is merely requisite, which is a very good sign for the industry's future development. However, the question of political willpower remains an open issue. Several legislators identified community solar's strengths and spoke of its potential to revitalize the low-income population's finances should virtual net metering pass. Fewer indicated that it was a strong priority to pass, indicating a sense of mild apathy toward community solar and net metering policy. This hesitance is likely well-founded as electric utilities, which were nearly universally identified as the most influential policy voice in the energy stand in stark opposition to community solar legislation, citing cost shifting concerns, the fact remains that legacy power companies tend to resist change, especially if it threatens the monopoly they hold over power markets, and their opposition does not mean that stronger community solar policy is not viable.

“As implausible as it might sound, the machine that holds the whole of our modern life in place works in practice, but not in theory. No one can see, grasp or plan for the whole of it. Wrapped up in this is how the utilities established themselves as monopolies and saddled the industry with the long-term inertia that a lack of competition too often begets... The utilities, which for so long have thrived on being the least inventive, least flexible, most run of the mill companies in America, didn't know how to change” (Bakke, 2017).

However, this study highlights the less individually influential, but vast multitude of voices from renters and homeowners alike who desire stronger action to pass community solar policy, and who desire to buy into community solar themselves if it ever became available. The vast majority of these people want community solar action from their lawmakers, and that desire, rooted in a desire to survive, should not be forgotten, nor trivialized as the uninformed opinions of people who don't really need to access the financial benefits of solar energy. It is a well-established fact that solar energy infrastructure is a decarbonization asset. The question this study dares the reader to ponder, is whether it can be more.

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## APPENDIX ONE: SURVEY RESULTS

### 1.0

#### Do You Rent or Own Your Home?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Renter	188	60.6	60.6	60.6
	Homeowner	122	39.4	39.4	100.0
	Total	310	100.0	100.0	

### 1.1

#### Current Solar Energy Subscriber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	6.5	6.5	6.5
	No	275	88.7	88.7	95.2
	Don't Know	15	4.8	4.8	100.0
	Total	310	100.0	100.0	

### 1.2

#### What is your primary motivation when purchasing electricity?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Financial	189	61.0	61.0	61.0
	Environmental	121	39.0	39.0	100.0
	Total	310	100.0	100.0	

### 1.3

#### Purchase if Affordable

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Yes	248	80.0	80.0	80.0
	No	24	7.7	7.7	87.7
	Don't Know	38	12.3	12.3	100.0
	Total	310	100.0	100.0	

#### 1.4

##### Solar's Expense Relative to Other Energy Sources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	65	21.0	21.0	21.0
	Less	116	37.4	37.4	58.4
	More	74	23.9	23.9	82.3
	Same	55	17.7	17.7	100.0
	Total	310	100.0	100.0	

#### 1.5

##### How Should the State Modify Financial Support For Community Solar?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase	184	59.4	67.9	67.9
	Maintain	50	16.1	18.5	86.3
	Decrease	37	11.9	13.7	100.0
	Total	271	87.4	100.0	
Missing	System	39	12.6		
Total		310	100.0		

#### 1.6

##### Statistics

Level of Interest in Community

Solar

N	Valid	310
	Missing	0
Mean	3.36	
Std. Deviation	1.295	

##### Level of Interest in Community Solar

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	40	12.9	12.9	12.9
	2	28	9.0	9.0	21.9
	3	96	31.0	31.0	52.9
	4	71	22.9	22.9	75.8
	5	75	24.2	24.2	100.0
	Total	310	100.0	100.0	

## 2.0

### Do You Rent or Own Your Home? \* What is your primary motivation when purchasing electricity? Crosstabulation

			What is your primary motivation when purchasing electricity?		
			Financial	Environmental	Total
Do You Rent or Own Your Home?	Renter	Count	127	61	188
		% within Do You Rent or Own Your Home?	67.6%	32.4%	100.0%
		% within What is your primary motivation when purchasing electricity?	67.2%	50.4%	60.6%
	Homeowner	Count	62	60	122
		% within Do You Rent or Own Your Home?	50.8%	49.2%	100.0%
		% within What is your primary motivation when purchasing electricity?	32.8%	49.6%	39.4%
Total	Count	189	121	310	
	% within Do You Rent or Own Your Home?	61.0%	39.0%	100.0%	
	% within What is your primary motivation when purchasing electricity?	100.0%	100.0%	100.0%	

## Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.706 <sup>a</sup>	1	.003		

## 2.1

**Do You Rent or Own Your Home? \* Relative Expense Crosstabulation**

		Relative Expense					
			Don't Know	Less	More	Same	Total
Do You Rent or Own Your Home?	Renter	Count	39	70	45	34	188
		% within Do You Rent or Own Your Home?	20.7%	37.2%	23.9%	18.1%	100.0%
	Homeowner	Count	26	46	29	21	122
		% within Do You Rent or Own Your Home?	21.3%	37.7%	23.8%	17.2%	100.0%
Total		Count	65	116	74	55	310
		% within Do You Rent or Own Your Home?	21.0%	37.4%	23.9%	17.7%	100.0%

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	.048 <sup>a</sup>	3	.997

## 2.2

**Do You Rent or Own Your Home? \* How should the state government modify financial support for community solar projects? Crosstabulation**

Count

		How should the state government modify financial support for community solar projects?			
		Decrease	Maintain	Increase	Total
	Renter	113	27	21	161

Do You Rent or Own Your Home?	Homeowner	71	23	16	110
Total		184	50	37	271

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.021 <sup>a</sup>	2	.600
Likelihood Ratio	1.015	2	.602
Linear-by-Linear Association	.637	1	.425
N of Valid Cases	271		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.02.

## 2.3

### Do You Rent or Own Your Home? \* Level of Interest in Community Solar Crosstabulation

			Level of Interest in Community Solar					Total
			1	2	3	4	5	
Do You Rent or Own Your Home?	Renter	Count	12	14	68	53	41	188
		% within Do You Rent or Own Your Home?	6.4%	7.4%	36.2%	28.2%	21.8%	100.0%
	Homeowner	Count	28	14	28	18	34	122
		% within Do You Rent or Own Your Home?	23.0%	11.5%	23.0%	14.8%	27.9%	100.0%
Total		Count	40	28	96	71	75	310
		% within Do You Rent or Own Your Home?	12.9%	9.0%	31.0%	22.9%	24.2%	100.0%

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.200 <sup>a</sup>	4	.000

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## APPENDIX TWO: INTERVIEW PROTOCOLS

### INTERVIEW PROTOCOL

Guiding questions to consider:

1. What is the current state of solar energy policy development in WA state?
2. What are the obstacles facing solar energy adoption?
3. How does community solar policy fit into a state renewable energy framework?
4. What is your perspective on the efficacy of community solar deployment compared to rooftop solar deployment?
5. Should solar policy be expanded, rolled back or kept the same and why?

### Interview Protocol

Thank you so much for agreeing to speak with me. I am a graduate student at The University of Washington, Bothell, and I am conducting a study of solar energy policy development within Washington State, and how policies promoting community solar project adoption fit within the larger state energy policy discussion moving forward. For this interview, I am interested in hearing about your experience working on state energy policy, your opinion on the future of solar adoption within the state. This will aid the study as it explores the future of solar deployment in the state, and what kind of effect said deployments will have on the economy. The following questions should be seen as potential avenues of discussion rather than a mandatory list of topics that must be discussed.

Typically, the interviews take about 15 minutes to 20 minutes. Your responses **will be recorded** to ensure accurate transcription of your commentary unless you don't wish to be recorded. It is fine if you feel it is necessary to go longer. You are also free to stop this interview at any time. You do not have to answer any questions you don't feel comfortable answering.

- Did you receive the consent form?
- Do you have any questions for me before we begin?
- If it's okay with you, I'm going to start recording.

Opening: Briefly describe your background as it pertains to energy policy, and your level of engagement with the solar policy process in general.

### Participant Questions:

1. What is the current state of solar energy policy in Washington State?
  - How do you feel about the current state?
  - What does state solar policy do well?
  - Is there anything that bothers you about the state's solar policy framework?
  - Is there anything you would change about state solar energy policy, and if so, what would the change be?

- 
2. Do you think of solar as an environmental investment, or a financial investment?
    - Do you see any non-environmental societal benefits?
    - How does this compare to up-front costs?
    - Who are the main beneficiaries of solar technology adoption?
  
  3. How do Washington State energy committees craft solar policy?
    - Where does policy advice come from? Who are the typical stakeholders to be consulted when the committee considers solar policy?
    - Do certain stakeholder voices carry more influence than others?
    - Which stakeholder voices typically struggle to influence discussions? Do you feel that all stakeholder voices are represented?
  
  4. What do you know about community solar projects?
    - How are they different from normal rooftop, or utility solar projects?
    - What is your view on the value of community solar projects compared to more traditional solar deployments?
    - What are community solar's biggest strengths and/or weaknesses in your opinion?
  
  5. What is the future roadmap for community solar development under the existing policy environment?
    - How well does state policy cover the different types of solar projects?
    - What kind of future do you see for solar adoption in-state in general?
    - Who do you expect to benefit the most from solar adoption moving forward?
  
  6. Do you see any obstacles to community solar project adoption across the state?
    - How do solar adoption trends change with renters instead of homeowners?
    - What kind of demand do you expect to see for community solar projects now and in the future?
  
  7. How would you characterize the potential community solar customer base?
    - What motivates the customers to buy in?
    - Do customers want the ability to buy into community solar projects?
    - Are customers aware of community solar?
    - Describe the viability of the community solar value proposition.

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That's all my questions. Before we end, do you have any questions for me?

Thank you for participating in this study!