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California Energy Commission
Dockets Office, MS-4
Re: Docket No. 16-0IR-02
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Interstate Renewable Energy Council, Inc.'s Comments on Barriers of Low-Income and Disadvantaged Communities to Energy Efficiency and Renewable Energy – Docket 16-OIR-02

Dear Commissioners:

In response to the Commission's August 1, 2016 *Notice of Energy Commission Workshop Regarding Barriers of Low-Income and Disadvantaged Communities to Energy Efficiency and Renewable Energy*, the Interstate Renewable Energy Council, Inc. (IREC) submits these comments addressing barriers to and opportunities for solar photovoltaic and other renewable energy generation for low-income customers and those in disadvantaged communities.

IREC (www.irecusa.org) is a 501(c)(3) non-partisan, non-profit organization working nationally to expand and simplify consumer access to reliable and affordable distributed clean energy by: (1) developing and advancing regulatory policy innovations; (2) generating and promoting national model rules, standards, and best practices; and (3) providing workforce training, education, and credentialing. IREC works

independently from renewable energy industries, trade associations, technologies, and advocacy organizations; and, though we promote the creation of robust, competitive clean energy markets, IREC does not have a financial stake in those markets. Grounded in the latest research and objective analysis, IREC's work helps inform and guide fact-based regulatory decision-making and workforce development efforts. Through collaborative partnerships with diverse stakeholders, IREC seeks to build consensus and achieve workable solutions to create a sustainable and economically strong clean energy future. The scope of IREC's work includes expanding programs that facilitate consumers' ability to host a renewable energy system to directly self-supply energy needs or provide energy to the grid, and implementing community and shared renewable energy programs to expand options for consumers that cannot host a renewable energy system.

As part of this work, IREC has participated in community and shared renewable energy proceedings at the California Public Utilities Commission (CPUC) and in several other states, including Oregon, Colorado, Minnesota, New York, Delaware, Maryland, and Washington, DC. In addition, IREC is currently engaged in the CPUC's net energy metering (NEM) successor tariff proceeding, Rulemaking (R.) 14-07-002 (also known as the "NEM 2.0" proceeding), with a focus on the CPUC's obligation to develop alternative policies to reach disadvantaged communities under Assembly Bill (AB 327) (Perea 2013). As described in more detail below, IREC filed detailed comments on the barriers facing these communities, as well as the opportunities for distributed renewable

energy. IREC also submitted our “CleanCARE” proposal as a possible alternative policy, and CleanCARE remains under CPUC consideration in both the NEM 2.0 proceeding, R.14-07-002, and the California Alternate Rates for Energy (CARE) proceeding, Applications (A.) 14-11-007 et al. CleanCARE is described further below and the proposal, as filed in R.14-07-002, is included as **Attachment B** to these comments. Finally, based on our experience working on these issues nationally, IREC has issued two foundational documents: *Model Rules for Shared Renewable Energy Programs*¹ and *Shared Renewable Energy for Low- to Moderate-Income Customer: Policy Guidelines and Model Provisions (LMI Guidelines)*.² Regarding the *LMI Guidelines* in particular, IREC developed this document in consultation with a working group of consumer advocates, environmental and environmental justice groups, and others working on low- to moderate-income customer issues. We include the *LMI Guidelines* as **Attachment A** to these comments.

¹ Available at www.irecusa.org/publications/model-rules-for-shared-renewable-energy-programs.

² Available at www.irecusa.org/publications/shared-renewable-energy-for-low-to-moderate-income-consumers-policy-guidelines-and-model-provisions.

I. BARRIERS TO AND OPPORTUNITIES FOR RENEWABLE ENERGY FOR LOW-INCOME CUSTOMERS AND CUSTOMERS IN DISADVANTAGED COMMUNITIES

As mentioned above, in R.14-07-002, the CPUC has been investigating barriers to renewable energy access for customers in disadvantaged communities to inform its development of policy alternatives to improve access for these customers, and IREC provided input via several rounds of written comments. In addition, IREC included a detailed discussion of barriers and opportunities for LMI customers and those in disadvantaged communities in our *LMI Guidelines*. We provide a short summary of these barriers below and direct the Commission to the *LMI Guidelines* (**Attachment A**, pp. 11-16) for further detail.

- **Low levels of homeownership:** Low-income customers and those in disadvantaged communities are not as likely to own their roofs, because they are renters and/or live in multi-tenant buildings. An effective shared renewable energy program, such as CleanCARE, could allow customers who do not own their own roofs or have suitable roof space to participate in and benefit from renewable energy projects. In addition, should participants relocate within the utility's service territory, they would be able to continue their participation in the program.
- **Lack of access to upfront capital or affordable credit:** These customers are also less likely to have access to upfront capital or affordable lines of credit. Therefore, any program intending to improve access for these customers must overcome

these capital and credit barriers, including through providing direct incentives, loans, credit enhancements, or other assistance, as described in more detail in IREC's *LMI Guidelines* (pp. 11-14, 17-34).

- **Small or nonexistent tax liability:** Similarly, low-income customers and those in disadvantaged communities are likely to have a small or nonexistent tax liability, which would prevent full monetization of renewable energy tax credits. This barrier must be taken into account in considering realistic financing options for these customers.
- **Reduced rates:** Since many low-income customers and customers in disadvantaged communities qualify for the CARE program, many of them have lower electric rates due to the CARE rate discount. As a result, under current NEM rules, they realize lower monthly bill savings as compared with a non-CARE customer with the same usage profile because NEM bill credits are based on a participant's retail rate. Therefore adopting on-site generation is not as attractive to them. Moreover, reduced rates mask the true costs of energy for these customers and dampen conservation signals. CleanCARE offers one way to address this barrier, as discussed further below, and any program seeking to reach CARE customers should account for this rate-related barrier.

- **Ineffective marketing, education and outreach:** Low-income customers and customers in disadvantaged communities may require specialized marketing, education, and outreach, both as far as the method used (e.g., language, medium, etc.) as well as the substance. This barrier is discussed in detail in IREC's *LMI Guidelines* (pp. 15-16).

Despite these barriers, low-income customers and their communities also have many characteristics that make them excellent partners in cultivating community action, including social capital (e.g., strong social networks), interest in civic engagement, community- and faith-based volunteerism, and the capacity to create innovative solutions to ensure that a shared renewables program meets their needs. We briefly discuss some of the potential opportunities in the *LMI Guidelines* (pp. 16-17).

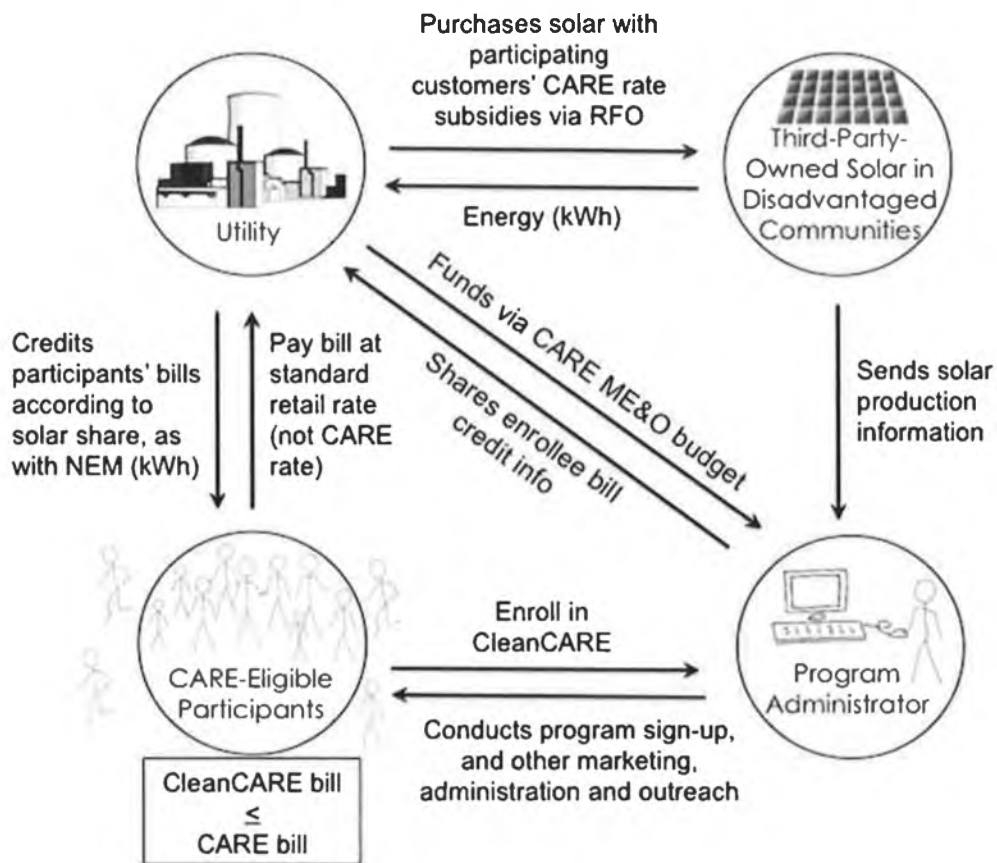
II. IREC'S CLEANCARE PROPOSAL

As discussed above, low-income customers and customers living in disadvantaged communities often face unique barriers to adopting customer-sited distributed generation. IREC's CleanCARE proposal addresses all of these barriers. Currently, it is under consideration in the CPUC NEM 2.0 docket, R.14-07-002. In addition, the CPUC is considering it in the CARE docket, A.14-11-007 et al., primarily on a narrow issue with respect to its legality under the current CARE statute. Although IREC has argued and continues to believe that CleanCARE is fully legal under current law, we note that these legal issues could be obviated by legislation.

In short, CleanCARE would allow customers eligible for the CARE program to choose to redirect the funds associated with their CARE rate discounts toward purchasing renewable generation from a third-party developer, selected by the utility through a competitive bid process. CARE customers electing the CleanCARE option would move to the standard rate for their rate class and, through participation in the CleanCARE program, would offset a portion of their monthly bills through kilowatt-hour (kWh) bill credits. As a result, a CleanCARE customer would receive the equivalent or a lower bill than the customer would have seen under the standard CARE program rates. In this way, the CleanCARE option would increase opportunities for low-income households to participate in renewable energy programs while guaranteeing at least the bill discount available under the current CARE program. According to our analysis and as proposed, the impact on the IOUs' revenues would be *de minimis* since CleanCARE relies on differently allocating the existing bill discount funds within the CARE program. As currently proposed, CleanCARE would begin as a five-megawatt pilot program and, if successful, would gradually expand to serve more customers over time. In addition, CleanCARE would initially rely only on solar generation in order to keep the design of the pilot program simple, and to leverage solar's currently attractive value proposition and its ability to locate in both rural and more urbanized locations. Energy efficiency and other renewable resources could be incorporated in the future, however.

The basic framework for CleanCARE is shown in **Figure 1**.

Figure 1: Overview of CleanCARE Concept



Based on an initial exploration of census data, IREC expects that there is significant overlap between CARE enrollment and customers living in disadvantaged communities, as defined below, but recognizes that (1) some CARE customers do not live in these communities and (2) some customers in these communities are not eligible for the CARE program. Nonetheless, IREC believes that CleanCARE would reach a significant customer segment in disadvantaged communities. In addition, CleanCARE

would require that all of the renewable energy facilities associated with the program be located within disadvantaged communities. In this way, CleanCARE would also encourage local environmental, public health, economic, and job-related benefits in those communities. Finally, IREC proposes that one way to phase in CleanCARE would be first to target CARE customers living in disadvantaged communities and then expand the program from there, by allowing CARE customers outside of disadvantaged communities to participate, but still siting projects within disadvantaged communities.

For more detail, IREC provides our full CleanCARE proposal, as filed in R.14-07-002, as **Attachment B** to these comments, and includes with it our analysis of the bill savings associated with CleanCARE and the assumptions underlying that analysis.

III. CONCLUSION

IREC appreciates the opportunity to submit these written comments. We are happy to provide additional information or answer questions from the Commission, its Staff, or other stakeholders.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

A handwritten signature in blue ink, appearing to read "Erica S. McConnell", with a long horizontal flourish extending to the right.

Erica S. McConnell

Attachments

- Attachment A** IREC's Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions
- Attachment B** IREC's CleanCARE Proposal and Analysis

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Attachment A



Shared Renewable Energy for Low- to Moderate-Income Consumers: POLICY GUIDELINES AND MODEL PROVISIONS



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IREC would also like to thank its Board of Directors and CEO, Jane Weissman, for their review and support of this effort.

To inform the development of *Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions*, IREC convened a Low-to Moderate-Income Working Group consisting of LMI customer-focused organizations, consumer advocates, environmental justice groups, and other experts. We are deeply appreciative of the contributions and assistance from the following Working Group members:

Amit Ronen	George Washington University Solar Institute
Anthony Giancatarino	The Center for Social Inclusion
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Tom Hunt	Clean Energy Collective
Tovah Trimming	California Environmental Justice Alliance/Golden Gate University School of Law, Environmental Law & Justice Clinic

EXECUTIVE SUMMARY

Across the United States, approximately 60% of households earned \$68,000 or less per year, roughly qualifying them as low- to moderate-income (LMI) households.¹ LMI households typically spend a notably higher percentage of household income on energy costs than their higher-income peers,² and thus stand to benefit significantly from reducing their energy bills through a combination of conservation, energy efficiency, and renewable energy measures. Yet these same households face considerable financial barriers, such as lack of access to capital or insufficient credit, that often prevent them from adopting these proven cost-saving clean energy measures.

Moreover, a higher proportion of LMI individuals and families live in rental or multifamily housing, and therefore face ownership barriers or split incentive barriers that make infeasible the adoption of energy efficiency measures and on-site renewable energy systems.³ In addition, language barriers, lack of Internet access, and constraints on resources and time may prevent many LMI customers from being aware of and/or understanding clean energy programmatic and financing options. What's more, marketing and education materials are typically not designed with the needs and priorities of LMI customers in mind, and therefore may not effectively speak to the LMI target audience.

Shared renewable energy policies and programs have great potential to address these barriers to renewable energy adoption among LMI customers, while also providing this customer segment with tangible benefits, including new opportunities to create pathways to social, economic, and environmental prosperity.

¹ Throughout this document, “low- to moderate-income (LMI)” is used as an inclusive term intended to capture households and customers earning up to 120% of the Area Median Income (AMI), which was approximately \$64,388 nationally in 2014, given a 2014 national median income of \$53,657. According to the U.S. Census Bureau, 60% of American households earned up to \$68,212 in 2014. Thus, although there is some discrepancy in the numbers, approximately 60% of households earned roughly 120% of AMI. Carmen DeNavas-Walt & Bernadette D. Proctor, U.S. Census Bureau, *Income and Poverty in the United States: 2014*, at 6, 31 (Sept. 2015), available at www.census.gov/content/dam/Census/library/publications/2015/demo/p60-252.pdf.

² See Center for American Progress, *State Policies to Increase Low Income Communities Access to Solar Power* (2014), available at www.americanprogress.org/issues/green/report/2014/09/23/97632/state-policies-to-increase-low-income-communities-access-to-solar-power (stating that the average percentage of income spent on energy costs for low-income households is more than twice the average for non-low-income households—8.3% compared to 2.9%—and four times the median national household energy cost burden—a median of 13.3% compared to 3.3%)[hereinafter *State Policies to Increase Low Income Communities Access to Solar Power*].

³ U.S. Census Bureau, Residential Vacancies and Homeownership in the Third Quarter 2015, at 10 (Oct. 27, 2015), available at www.census.gov/housing/hvs/files/currenthvspress.pdf (stating that in 2014, the homeownership rate for U.S. households with a family income less than the median family income (about \$66,000) was 49%, as compared to 79% for households with a family income equal to or greater than the median family income, and 64% average across the United States. 2015 numbers are similar, with percentages of 49%, 78.4%, and 63.7%, respectively, in Q3); U.S. Census Bureau, Income Main, Detailed Tables, Family, FINC-01 Selected Characteristics of Families by Total Money Income in 2014, www.census.gov/hhes/www/cpstables/032015/faminc/toc.htm.

Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions (LMI Guidelines) aims to build upon IREC's existing [Model Program Rules for Shared Renewable Energy \(Model Rules\)](#), published in 2010 and updated in 2013, to provide additional information and tools to policymakers, regulators, utilities, shared renewable energy developers, program administrators and others to support the adoption and implementation of shared renewables programs specifically designed to provide meaningful and tangible benefits to LMI customers.

Across the United States, approximately 60% of households earned \$68,000 or less per year, roughly qualifying them as low- to moderate-income (LMI) households.

Since the release of IREC's 2013 *Model Rules*, there has been growing interest in improving renewable energy access for LMI customers through shared renewable energy programs,⁴ and more states are starting to focus on this issue explicitly in policy and program design.⁵ Yet, while some shared renewable energy programs to date have focused more explicitly on LMI customers, there remain relatively few concrete, effective shared renewables programs targeting LMI customers.

In addition, best practices for implementation are still emerging. The lessons and insights from existing programs, as well as corollary policies and tools, are valuable for informing next steps on this important policy horizon.

⁴ See, e.g., U.S. DOE, National Community Solar Partnership, <http://energy.gov/eere/solarpoweringamerica/national-community-solar-partnership>; Ben Passer, Fresh Energy, *Bringing Community Solar to a Broader Community* (Working Draft, Nov. 2015), available at <http://fresh-energy.org/wp/wp-content/uploads/2015/11/Bringing-Community-Solar-to-a-Broader-Community.pdf>; James Mueller & Amit Ronen, George Washington Solar Institute, *Working Paper, Summary for Policymakers: Bridging the Solar Income Gap*, at 2 (Jan. 2015), available at <http://solar.gwu.edu/research/bridging-solar-income-gap>;

⁵ See, e.g., MD PSC, Notice Initiating rulemaking and Notice of Rulemaking Session, RM 56 (Nov. 12, 2015), available at http://webapp.psc.state.md.us/intranet/AdminDocket/NewIndex3_VOpenFile.cfm?ServerFilePath=C%3A%5CAdminDocket%5CRuleMaking%5CRM56%5C002%2Epdf (with draft rules containing LMI provisions attached); OR PUC, Report to the Senate Committee on Environment and Natural Resources and the House Interim Committee on Energy and Environment Regarding Attributes for the Design of a Community Solar Program, UM 1746, available at <http://apps.puc.state.or.us/edockets/edocs.asp?FileType=HAH&FileName=um1746hah131652.pdf&DocketID=19646&numSequence=50> (including recommendations regarding low-income customer access); NY PSC, Order Establishing a Community Distributed Generation Program and Making Other Findings, 15-E-0082 (July 17, 2015), available at <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={76520435-25ED-4B84-8477-6433CE88DA86}> (discussing low-income customer access and establishing the Low-Income Customer Collaborative) [hereinafter NY CDG Order].

What is Shared Renewable Energy?

Shared renewable energy programs enable multiple, dispersed customers to share the economic benefits from one renewable energy system via their individual utility bills. Shared renewable energy represents a critical means of expanding access to renewable energy to more Americans.

Shared solar programs are currently the most prevalent form of shared renewables programs in the United States. Nonetheless, shared renewables programs that rely on other renewable generation, such as wind, may make sense for certain communities, and some examples exist today.



The 2012 ribbon-cutting event for a community solar project at the Duck River Electric Membership Cooperative in Shelbyville, Tenn. (Photo courtesy of Duck River EMC.)

For more information:

- *Model Rules for Shared Renewable Energy*, IREC (2013), www.irecusa.org/publications/model-rules-for-shared-renewable-energy-programs/
- *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*, NREL & US Department of Energy (July 2015), <http://www.nrel.gov/docs/fy15osti/63892.pdf>
- *A Guide to Community Shared Solar: Utility, Private, and Nonprofit Project Development*, NREL 2012 <http://www.nrel.gov/docs/fy12osti/54570.pdf>

CONTENT OVERVIEW

IREC's *LMI Guidelines* and accompanying LMI Model Provisions are designed to work in concert with IREC's *Model Rules*, and serve as IREC's recommendations for state, local and utility programs that aim to provide more equitable access to shared renewable energy to more customers. By explicitly identifying and explaining the barriers that LMI customers face to participating in shared renewable energy programs, IREC's *LMI Guidelines* and LMI Model Provisions seek to inform and improve programs' ability to address the barriers.

They are not intended to minimize the remaining barriers facing general market shared renewable energy programs, which require continued focus and attention going forward.

The *LMI Guidelines* include the following core components:

[Section I](#) addresses how to define "LMI customers," including ways to incorporate economic, social, demographic, and environmental factors into the definition, and discusses how to design facilities to serve LMI customers.

[Section II](#) offers an overview of the most prominent LMI customer barriers to participation in shared renewable energy programs as well as the positive opportunities for engagement with this customer segment. This section also includes short case studies on existing shared renewable energy programs targeting LMI customers.

[Section III](#) discusses various financing tools and mechanisms to address the financial barriers faced by LMI customers, which can be some of the most significant barriers these customers face to participation in shared renewable energy. This section also includes short case studies on some of the financing tools and mechanisms available.

[Section IV](#) provides LMI Model Provisions for LMI shared renewable energy programs, intended to offer policymakers and regulators language from which to build an independent LMI shared renewable energy program, or inform an LMI component to a general market shared renewable energy program.

**IREC's
recommendations for
state, local and utility
programs aim to
provide more equitable
access to shared
renewable energy to
more customers.**

[The Appendix](#) includes IREC's CleanCARE proposal, which offers an example of one way to design a shared renewable energy program to reach and benefit LMI customers. CleanCARE is under consideration at the California Public Utilities Commission.⁶

IREC expects both designing scalable programs and facilitating LMI customer participation will continue to be core goals for many states and other program implementers. Successful programs will need to consider components to achieve both goals going forward, and collaboration between interest groups and other stakeholders will be essential.

Ensuring the future success and continued growth of shared renewable energy programs for the benefit of LMI and non-LMI customers alike will require that replicable best practices be adopted and that successful program models be emulated, lest the promise of shared renewable energy fall short of its potential.

By focusing more on the specific challenges and opportunities for LMI customers and the facilities serving them, policymakers, developers, and program administrators will be better equipped to reach and better serve this diverse customer group.

Likewise, IREC encourages policymakers and others to think carefully about the overarching goals of the program prior to its design and any financing components. In turn, these goals will dictate how the program is evaluated, and ultimately whether or not the program is considered successful.

⁶ The commission has considered CleanCARE in dockets A.14-11-007 et al. (ratepayer assistance docket), R.14-07-002 (net metering docket), and R.12-06-013 (residential rate reform docket), however it is currently under active consideration only in A.14-11-007 and R.14-07-002.

INTRODUCTION

Across the United States, approximately 60% of households earned \$68,000 or less per year in 2014, roughly qualifying them as low- to moderate-income (LMI) households.⁷ LMI households typically spend a notably higher percentage of household income on energy costs than their higher-income peers,⁸ and thus stand to benefit significantly from reducing their energy bills through a combination of conservation, energy efficiency, and renewable energy measures. Yet these same households face considerable financial barriers that often prevent them from adopting these proven cost-saving clean energy measures. Moreover, a higher proportion of LMI individuals and families live in rental or multifamily housing, and therefore face ownership barriers that make infeasible the adoption of energy efficiency measures and on-site renewable energy systems.⁹

Shared renewable energy policies and programs have great potential to address these and other barriers to renewable energy adoption among LMI customers, while also providing this customer segment with tangible economic, social, and environmental benefits. In IREC's *Model Program Rules for Shared Renewable Energy (Model Rules)*, published in 2010 and updated in 2013,¹⁰ we included a brief discussion of the importance of designing shared renewables programs to be accessible to low-income customers. At the time, however, there were few policy models and sample programs to draw from to provide more insight on program design; thus, the *Model Rules* did not include a detailed low-income component. Since the release of the 2013 *Model Rules*, IREC has seen growing interest in improving renewable energy access for LMI customers through shared renewable energy programs,¹¹ and more states are starting to focus on this issue explicitly in policy and program design.¹²

Few concrete, effective shared renewables programs targeting LMI customers are in place, however, and best practices for implementation are still emerging. Although some programs have focused more on LMI customers and have expanded their participation in shared renewable energy, for a myriad of reasons described further in this report, many of these programs have not yet realized their full potential to serve these customers. The lessons and insights from these efforts are exceedingly valuable for informing next steps on this important policy horizon.

⁷ *Supra* n.1.

⁸ *Supra* n.2.

⁹ *Supra* n.3.

¹⁰ IREC originally published these as *Community Renewables Model Program Rules* and later modified the title, as explained in the 2013 edition.

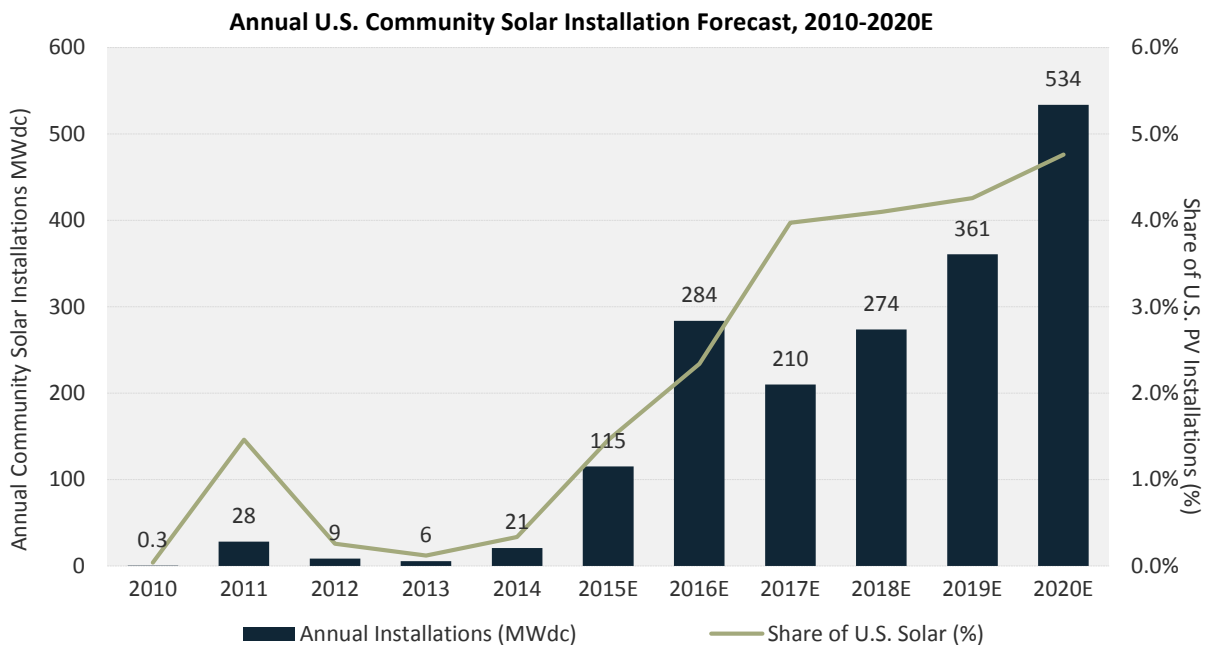
¹¹ See, e.g., U.S. DOE, National Community Solar Partnership, <http://energy.gov/eere/solarpoweringamerica/national-community-solar-partnership>; Ben Passer, Fresh Energy, *Bringing Community Solar to a Broader Community* (Working Draft, Nov. 2015), available at <http://fresh-energy.org/wp/wp-content/uploads/2015/11/Bringing-Community-Solar-to-a-Broader-Community.pdf>; James Mueller & Amit Ronen, George Washington Solar Institute, *Working Paper, Summary for Policymakers: Bridging the Solar Income Gap*, at 2 (Jan. 2015), available at <http://solar.gwu.edu/research/bridging-solar-income-gap>.

¹² *Supra* n.5.

Shared Solar: Poised for Growth

Although there is relatively limited installed shared solar capacity to date—over 180 MW at the end of 2015—shared solar is expected to grow dramatically in the coming years, reaching over half a gigawatt by 2020.

Low-to-moderate income households in the coming years have the potential to expand market growth considerably, yielding added environmental and economic benefits from increased renewable energy capacity.



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Sources:

- *GTM Research Community Solar Market Outlook, 2010-2020E* (June 2015), <http://www.greentechmedia.com/research/report/us-community-solar-market-outlook-2015-2020>
- *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*, NREL & US Department of Energy (July 2015), <http://www.nrel.gov/docs/fy15osti/63892.pdf>
- US Community Solar Market to Grow Fivefold in 2015, Top 500 MW in 2020, Greentech Media (June 23, 2015), www.greentechmedia.com/articles/read/us-community-solar-market-to-grow-fivefold-in-2015-top-500-mw-in-2020

With this report, *Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions*, IREC aims to provide information and tools to policymakers, regulators, utilities, shared renewable energy developers, program administrators and others to support the adoption and implementation of shared renewables programs specifically designed to provide meaningful and tangible benefits to LMI customers through their participation, including new opportunities to create pathways to social, economic, and environmental prosperity.

By focusing more on the specific challenges and opportunities for LMI customers and the facilities serving them, policymakers, developers, and program administrators will be better equipped to reach and better serve this diverse customer group.

These *LMI Guidelines* are not intended to minimize the remaining barriers facing general market shared renewable energy programs, which require continued focus and attention going forward. Efforts to develop shared renewable energy programs or policies that more effectively reach LMI customers should not come at the expense of, or be in lieu of, sustained and expanded efforts to develop shared renewable energy program and policies that target ALL customers. Ensuring the future success and continued growth of shared renewable energy programs for the benefit of LMI and non-LMI customers alike will require that replicable best practices be adopted and that successful program models be emulated, lest the promise of shared renewable energy fall short of its potential.

In developing these *LMI Guidelines*, IREC conducted extensive research on the barriers to LMI access to shared renewable energy and convened numerous in-person meetings and calls with LMI customer-focused organizations, consumer advocates, environmental justice groups, and others to inform our research. As part of these efforts, IREC formed an LMI Working Group. Three meetings were held to explore several key themes and issues reflected in these LMI Guidelines and to solicit input to guide their development. We are deeply appreciative of the contributions and assistance from Working Group members (see [Acknowledgments for a complete list](#)).

These *LMI Guidelines* are intended to complement IREC's Model Rules. They contain the following:

- [Section I](#) discusses how to define “LMI customers,” including ways to incorporate economic, social, demographic, and environmental factors into the definition, and discussion of how to design facilities to serve LMI Customers.
- [Section II](#) reviews the most prominent LMI customer barriers to participation in shared renewable energy programs as well as the positive opportunities for engagement with this customer segment. This section also includes short case studies on existing shared renewable energy programs targeting LMI customers.

- [Section III](#) discusses various financing tools and mechanisms to address the financial barriers faced by LMI customers, which can be some of the most significant barriers these customers face to participation in shared renewable energy. This section also includes short case studies on some of the financing tools and mechanisms available.
- [Section IV](#) provides LMI Model Provisions for LMI shared renewable energy programs, intended to offer policymakers and regulators language from which to build an independent LMI shared renewable energy program or inform an LMI component to a general market shared renewable energy program.
- [The Appendix](#) includes IREC’s CleanCARE proposal, which offers a concrete example of one way to design a shared renewable energy program to reach and benefit LMI customers. CleanCARE is under consideration at the California Public Utilities Commission.¹³

¹³ *Supra* n.6.

I. Identifying LMI Customers and Designing Facilities to Serve LMI Customers

A. LMI Customers

Policymakers and advocates, among others, have not taken a consistent approach to defining “LMI customers,” not just within shared renewables programs, but also more broadly across the spectrum of LMI energy-related programs in place today. The definition used typically depends on the goals of the program, as well as available financing and financial incentives, which may necessarily limit the number and breadth of customers that a program can target. In addition, it may be affected by the existence of other programs intended to serve LMI customers, and the particular goals and target customers of those programs.

In many cases, programs are focused exclusively on income-based criteria and therefore base eligibility on household income, typically as compared to the area median income (AMI) for the county or city in which a participant resides.¹⁴ California’s Single-Family Affordable Solar Homes (SASH) program, for example, sets its income-based eligibility requirement at 80% of AMI,¹⁵ which comports with the US Department of Housing and Urban Development (HUD) definition of “low-income” for Section 8 housing and other programs.¹⁶ In California, in 2015, that would be \$55,750 for a family of four.¹⁷ Alternatively, if a customer is already participating in a means-based program such as Medicare, it may be less administratively burdensome for that customer to provide proof of that concurrent eligibility rather than, for example, supplying tax returns, pay stubs or any other method of proof of income.¹⁸ However, if a program also wants to include “moderate” income earners as well as “low-income” customers, as IREC recommends in these *LMI Guidelines*, the eligibility would need to be set at a higher income threshold, such as 120% of AMI, which is consistent with the HUD threshold for moderate income for its Neighborhood Stabilization Program (NSP).¹⁹ Using the 2015 California example again, this would be \$83,625 for a family of four. **It is important to note that moderate-income customers may have higher credit scores, and may otherwise be in a better position to participate in a shared renewable energy program. Thus, while LMI customers are often grouped together, different program design approaches may be necessary to more effectively reach the range of customers within the LMI category.**

¹⁴ Area Median Income is tracked by the U.S. Department of Housing and Urban Development. See: <http://www.huduser.gov/portal/datasets/il/il15/index.html>

¹⁵ Single-Family Affordable Solar Homes (SASH) 2.0 Program Handbook § 4.2.1 (Applicant Eligibility), pp. 7-8, *available at* www.cpuc.ca.gov/NR/rdonlyres/B68AAA33-3421-41CA-A14B-E652A269B17F/0/SASHProgramHandbook.pdf. For more detail on the SASH program generally, see www.cpuc.ca.gov/PUC/energy/Solar/sash.htm.

¹⁶ FY 2015 HUD Income Limits Briefing Materials at p. 1, www.huduser.gov/portal/datasets/il/il15/IncomeLimitsBriefingMaterial_FY15_Rev_2.pdf.

¹⁷ HUD FY 2015 State Income Limits, www.huduser.gov/portal/datasets/il/il15/State_Incomelimits_Report.pdf.

¹⁸ See, e.g., 4 CCR 723-3 Rule 3665(d)(V)(A) (“CSG subscriber organizations and investor owned QRUs may rely on certification by the Colorado Department of Human Services for acceptance in the Colorado Low-Income Energy Assistance Program (LEAP) as evidence of eligibility as an eligible low-income CSG subscriber in a CSG.”).

¹⁹ See, e.g., NSP Eligibility Requirements, www.hudexchange.info/programs/nsp/nsp-eligibility-requirements.

Participants in IREC’s LMI Working Group and other LMI advocates IREC has consulted through our research have emphasized the need to incorporate location-based, environmental, demographic and other criteria into shared renewables and other renewable energy program eligibility requirements, in order to capture the various customer groups that face the barriers described further in [Section II](#). Terms used to describe these customers and their communities include affordable housing, disadvantaged, underserved, minority and frontline communities, and communities of color. For example, when California passed legislation in 2013 requiring the California Public Utilities Commission (CPUC) to develop a successor tariff or contract to net metering, one component of that legislation required the implementation of specific alternatives designed to promote distributed generation among residential customers in “disadvantaged communities.”²⁰ The CPUC is considering using the California Communities Environmental Health Screening Tool Version 2.0 (CalEnviroScreen) to identify “disadvantaged communities.”²¹ CalEnviroScreen incorporates not just income-based criteria, but also environmental and public health, educational, unemployment, and other criteria.²² Although California is a leading state in this respect and most states have not yet developed tools similar to CalEnviroScreen, there is nonetheless growing interest across the United States in incorporating criteria beyond income to determine customer eligibility.

In these *LMI Guidelines*, IREC has chosen to use “low- to moderate-income” or “LMI” because it seems to be one of the more commonly used terms. Depending on the focus of a particular program, however, different terminology may be more appropriate. In our LMI Model Provisions, IREC offers a range of options for LMI eligibility to allow for flexibility in program design, depending on a particular program’s goals and target customers.

B. Designing Facilities to Serve LMI Customers

In addition to defining “LMI customer,” it is also necessary to define what constitutes a shared renewables facility intended to serve LMI customers, referenced in these *LMI Guidelines* as an “LMI facility.” As discussed below in [Section III](#), this issue ties directly to facility financing. For shared renewable energy facilities focused on serving LMI customers, developers may need to rely on another customer or group of customers to serve as “anchor” participants in a facility, who can also serve to mitigate some of the credit and other financial issues faced by LMI customers. For example, an LMI facility may rely on a large commercial or industrial customer to subscribe to a significant percentage of the facility (e.g., 40%) to mitigate the risk of signing up the remaining 60% of the facility’s capacity in smaller subscriptions to LMI participants and/or other smaller participants, some of whom may have low credit scores and/or may require additional incentives to facilitate their

²⁰ Cal. Pub. Util. Code 2827.1(b)(1). For more information on the California commission’s consideration of “disadvantaged communities” alternatives, see CA PUC R.14-07-002.

²¹ Cal. Pub. Util. Comm’n, D.16-01-044, *Decision Adopting Successor to Net Energy Metering Tariff*, R.14-07-002, at 103 (Feb. 5, 2016) (indicating that the commission will continue consideration of the alternatives for disadvantaged communities in a subsequent phase of the proceeding, wherein a determination on the use of the CalEnviroScreen will likely be made).

²² For more information about the CalEnviroScreen 2.0 tool, see <http://oehha.ca.gov/ej/ces2.html>.

participation. Such an arrangement could allow developers to rely on non-LMI participants to offset some of the costs and perceived risk associated with LMI participants.

However, it is important to note that the higher the LMI participation rate in an LMI-focused facility, the greater the need for incentives and other financing tools to ensure the shared renewables program success. In the case of the Colorado Community Solar Gardens Program, which requires a mandatory LMI customer participation rate of 5% of the total project subscriptions, participating shared solar developers have not voluntarily exceeded the 5% participation level without the availability of other incentives or financing mechanism, which could mitigate the risk to lenders and offset the additional costs borne by other participants. Allowing LMI facilities to have a lower percentage of LMI participants is more feasible for facility developers to accommodate and finance.

In our LMI Model Provisions, based on conversations with our LMI Working Group, IREC suggests that an LMI facility (i.e., a facility intended to serve LMI customers) should have at least 60% LMI participation—that is, the majority of the LMI facility would be comprised of LMI participants—which would leave 40% of its capacity for anchor participants, such as larger commercial, industrial, or public customers (e.g., schools or governments), or other residential customers. This ratio of LMI to non-LMI customer participation is intended to ensure that the facility is dedicated to serving and benefiting a meaningful number of LMI customers. The viability of a 60% LMI facility is inextricably tied to financing issues, however, and IREC emphasizes that these percentages will need to be adjusted on a program-by-program basis, depending on available incentives, financing tools and mechanisms, and other specific circumstances. For example, in Phase I of its Community Distributed Generation program, New York provides that “low-income facilities,” defined as having at least 20% low-income participants, may participate in the program, without defining any other dedicated financial tools or programs to facilitate development of these facilities.²³ In contrast, California’s Multifamily Affordable Solar Housing (MASH) program relies on California Solar Initiative funds to support its requirement that all participating facilities involve 100% low-income participants.²⁴ **It is recommended that the program and policy goals and metrics for LMI customer participation rates be as specific as possible. This specificity will help garner buy-in from all involved stakeholders (including LMI advocates, project developers, lenders, utilities, and program administrators, among others), as well as help determine the appropriate level of incentives and/or financial tools needed to achieve the goals set forth.**

The location of shared renewable energy facilities within LMI customers’ communities (e.g., within “disadvantaged communities”) may also be a factor in defining the LMI facility. For some

²³ NY CDG Order, supra n.5, at 24-26. In New York, a “low-income customer” is defined as a customer is an Assistance Program Participant receiving benefits under the Home Energy Assistance Program (HEAP) or a utility-administered low income discount program, as discussed in the Retail Access Rehearing Order.

As discussed below in Section III, community distributed generation projects are available for existing NYSERDA incentives, although NYSERDA has not specified any additional funding targeted at LMI shared renewables facilities specifically.

²⁴ *California Public Utilities Commission Multifamily Affordable Solar Housing Program Handbook* at 4-8, 14-19 (1st ed. 2015) (Program Overview and MASH Program Participants), available at www.gosolarcalifornia.ca.gov/documents/MASH_Handbook.pdf [hereinafter MASH Handbook].

Colorado's Community Solar Gardens (CSG) Program

Following a law passed in 2010, Colorado allows its residents to participate in Community Solar Gardens (CSGs), which are centrally located shared solar arrays with grid-connected subscribers (homes and businesses) that receive the benefits of participation via bill credits. The CSGs may be owned by a utility or any third-party organization, although to date they are all third-party-owned. Each CSG must have at least 10 subscribers. Individual subscriptions can be any size (including less than 1 kW) but may not exceed 40% of the CSGs total capacity. Subscribers must be located in the same utility service territory and the same or adjacent county as the CSG. In 2014, the Colorado Public Utilities Commission set minimum and maximum purchase targets for IOUs each year. For example, Xcel Energy must purchase between 6.5 and 30 MW of energy and associated renewable energy credits (RECs) from new CSGs each year for 2014-2016.

In addition to the IOUs, a number of municipalities and cooperative utilities in Colorado have also voluntarily developed CSGs for their customers or members, outside of the confines of the state-jurisdictional program.

The statute directed the Colorado PSC to “formulate and implement policies...that simultaneously encourage ownership in community solar gardens by residential retail customers, and agricultural producers, including low-income customers, to the extent the commission finds there to be demand for such ownership.” The commission then established, through rulemaking, a mandatory requirement that at least 5% of an IOU's purchases from CSGs must be reserved for low-income CSG subscribers. To date, of the approximately 48 MW of installed CSG capacity, 2.5 MW are allocated to and subscribed by LMI customers. Developers must have the 5% for low-income customers fully subscribed by a project's operation date, and it appears that all CSG project developers are meeting the requirement.

However, while the program has succeeded in increasing adoption rates among low-income customers, the program has not been without challenges. One significant challenge is the placement of the burden of integrating low-income customer participants into CSG projects on facility developers, without additional financial drivers or other supporting program components in place. Participants may have to complete paperwork in order to demonstrate eligibility and get approved to participate, which can also pose barriers to customers whose life circumstances may be impairing their ability to dedicate the necessary time and energy to go through that process (e.g., long or non-traditional work hours, other more immediate resource priorities, language barriers, etc.). Conversations with developers have revealed that they have challenges qualifying, recruiting, and retaining eligible customers. Additionally, there is a fairly high turnover rate of participation, as many customers are not staying connected to the same electric meter for more than three months. Developers must maintain a regular waitlist of customers to ensure that the 5% threshold is maintained, yet the aforementioned challenges of finding and recruiting customers makes this difficult, as well.

All of these factors add costs to the program, which are ultimately borne by other subscribers. Moreover the bid process through which programs must go to secure placement in the program results in a highly competitive program, and thus, very thin margins for developers and financiers. The low-income carve-out further erodes these margins, making it extremely unattractive to exceed the mandatory 5% amount; in practice, due to the way the program is structured, no developers exceed this requirement and effectively “write off” low-income participants as another program cost.

continued

Colorado's Community Solar Gardens (CSG) Program *continued*

The resounding takeaway from the Colorado CSG program experience is that more robust financial mechanisms and/or other program components must be present in order to make an LMI carve-out attractive to financiers and developers. An upfront incentive or loan loss reserve component could help mitigate program risk and help cover some of the additional costs that will be incurred to adapt the program to LMI customers. In addition, establishing partnerships with existing LMI community groups and government agencies that work with LMI customers can help reduce the amount of time and resources spent identifying, qualifying, recruiting, retaining LMI customers, as well as minimizing confusing, time-consuming and/or convoluted processes for the customer. Such partnerships can help ensure the program works more efficiently and cost-effectively, while also ensure the target customers are educated and engaged appropriately and meaningfully.

Customer Eligibility: For the purposes of the program, any subscriber that is a member of one of the following groups qualifies as a low-income subscriber: Energy Outreach Colorado; the Atmosphere Conservancy; Colorado LEAP Program; and a Municipal Housing Authority (ex: Denver Housing Authority). The customers must also be located in a single family home and must have the meter in their name in order to participate. Participants must be approved by the Colorado Department of Human Services.

More Information:

- Colorado CSG Enabling Statute, HB 1342 (2010): <https://legiscan.com/CO/text/HB1342/id/381889/Colorado-2010-HB1342-Enrolled.pdf>
- Colorado PUC rules governing CSGs (4 CCR 723-3, Rule 3665): <http://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=5738&fileName=4%20CCR%20723-3>
- Xcel Energy Tariff: http://www.xcelenergy.com/Energy_Solutions/Residential_Solutions/Renewable_Energy_Solutions/Solar*Rewards%20AE_Community%20AE_-_CO
- <http://www.xcelenergy.com/staticfiles/xcel/Marketing/Files/CO-Res-Solar-Rewards-2014-Community-Tariff.pdf>
- Black Hills Power Tariff: <http://www.blackhillspower.com/node/111139>

policymakers, LMI advocates, community organizations, and other stakeholders, locating LMI facilities within or near a designated disadvantaged community may be a program design priority. In these cases, the size, exact location, and other attributes of the facilities are important considerations to ensure these facilities are truly benefiting those communities, and these decisions benefit from close coordination with community organizations and other local advocates. This focus on location typically comes in response to the disproportionately high impact on these communities by environmental pollution from traditional electric generation and other energy-related industries.²⁵ Local environmental and health benefits resulting from shared renewable energy facilities may be difficult to measure, especially if facilities are necessarily smaller due to their location in urban areas. However, the cumulative effects of numerous shared renewable energy facilities in a region can still yield measureable local environmental benefits along with state, regional, national and/or global environmental benefits, not to mention benefits to the electricity grid and all ratepayers.

The desire to locate shared facilities within LMI communities is also typically driven by an interest in improving the economic wellbeing of these communities, and providing pathways for residents to more directly participate in and benefit from the clean energy economy.²⁶ To accomplish these economic goals successfully, programs often require additional funding or incentives for community education, job training, and/or local hiring. While some direct, indirect and induced economic development benefits may result from simply locating facilities within LMI customers' communities, these positive impacts are not guaranteed without targeted efforts. In addition, it is recommended that the program goals, including any economic goals, be as specific as possible and that sufficient measures are in place to ensure they are achieved.

Lastly, IREC emphasizes that project specifications, locational restrictions, and additional program components, such as job training and/or local hiring, can add program costs. Since LMI subscribers are typically very cost-sensitive, however, it is unlikely they would be able to shoulder these extra costs, and therefore these costs are likely to be borne by other subscribers and/or developers. Increased costs for developers can negatively impact their ability to obtain project financing, which in turn can drive up project costs for subscribers and negatively impact the success of the program. Therefore, depending on the requirements, these types of program components can require some sort of additional incentive. Regardless, program designers and stakeholders should be sensitive to potential cost impacts in setting program requirements and goals relating to an LMI facility.

²⁵ See, e.g., Renee Skelton & Vernice Miller, *The Environmental Justice Movement*, National Resources Defense Council (Oct. 12, 2006), available at www.nrdc.org/ej/history/hej.asp.

²⁶ See, e.g., National Association for the Advancement of Colored People. *NAACP Board Passes Clean Energy Resolution*. 11 March 2015. <http://www.naacp.org/press/entry/naacp-board-passes-clean-energy-resolution1>

II. Barriers to Adoption and Opportunities for Engagement

Although shared renewable energy is often cited as a means to overcome barriers to LMI customer access to and adoption of renewable energy, IREC has observed that many programs to date have inadequately addressed these barriers and have not resulted in substantial LMI customer participation. While a subset of programs explicitly address LMI access—including California’s MASH program, California’s Green Tariff Shared Renewables (GTSR) program, Colorado’s Community Solar Gardens (CSG) program, and New York’s Community Distributed Generation program—at least some LMI advocates have expressed concern that their design does not effectively facilitate LMI customer participation or provide direct LMI customer benefits. As policymakers, regulators, developers, and other stakeholders continue the important work of designing general market shared renewables programs to bring the market to scale, program designers and stakeholders, including LMI advocates, are simultaneously paying increased attention to incorporating program components that better ensure that LMI customers can participate. **IREC expects both designing scalable programs and facilitating LMI customer participation will continue to be core goals for many states and other program implementers. Successful programs will need to consider components to achieve both goals going forward, and that collaboration between interest groups and other stakeholders will be essential.**

By explicitly identifying and explaining the barriers that LMI customers face to participating in shared renewable energy programs, IREC seeks to inform and improve programs’ ability to address them. We have also indicated where barriers are specifically addressed in our LMI Model Provisions.

A. Financial Barriers

Lack of access to the capital or sufficient credit necessary to participate in a shared renewable energy program is a major barrier for LMI customers, just as it is for their ability to adopt on-site renewable energy generation. In other words, these customers not only lack the capital necessary to pay upfront to participate in a shared renewables program, they also often do not meet the credit criteria to qualify for a loan or another option that would help to defray or eliminate those upfront costs. In addition, for some of these customers, the myriad economic insecurities that they face on a daily basis—energy, housing, health care, and food—can make it impossible for them to prioritize participation in shared renewable energy over other needs. These financial barriers for LMI customers make it difficult in turn for LMI-focused facilities to obtain favorable financing arrangements, since financiers may be wary of their subscription base.

Local, state and/or federal incentives may help to overcome this barrier, however their design must be sensitive to LMI customers’ particular needs. Specifically, LMI customers typically lack the tax appetite to directly take advantage of tax incentives, although, as discussed below in [Section III](#), such

incentives may be directed to shared renewables developers, who could then pass the savings through to participants via lower subscription prices.

In addition, in some states, some LMI customers may be eligible for discounted electricity rates through ratepayer assistance programs, which can function as a barrier to shared renewables participation, as well as participation in on-site renewable energy, energy efficiency, and conservation programs, depending on program design. In effect, the discounted rate, while incredibly important for providing LMI customers with needed relief from energy bills and rate increases (which can in turn help avoid payment delinquencies and disconnections), can also have the unintended effect of convoluting the price signal to encourage adoption of measures and behaviors that can function to reduce their energy usage and energy bills. If, for example, a shared renewables program relies on the participating customer's retail rate to determine the value of the customer's bill credits, this customer may see lower savings than others comparably situated, but who are not receiving ratepayer assistance, because the customer's bill credit value would be reduced. Thus, participation in the program is less attractive because it takes longer to realize the full economic benefits that might be available to non-LMI customers.²⁷

[Section III](#) discusses the various financing tools and mechanisms that programs can incorporate to overcome these barriers, and includes three case studies to provide examples of these tools and mechanisms being used in practice. The LMI Model Provisions also include a section addressing "[Additional Financing Considerations.](#)" **Although IREC does not recommend a particular financing model in the LMI Model Provisions, we suggest that all LMI shared renewables programs should include one or more of these options to facilitate LMI participation.**

Although the Model Provisions do not specify a minimum participation term for LMI customers, this program design component is also closely linked to financial barriers for both LMI customers and LMI facilities. LMI customers may prefer or require flexibility in participation term (e.g., one month minimum term) in order to balance their participation with other financial demands. Financiers, however, are typically wary of a subscriber base that has only made a very short-term commitment to the facility due to the payback risk involved, and therefore prefer or require longer participation commitments unless that risk can be mitigated by other financing mechanisms. Moreover, programs that allow for frequent (e.g., monthly) customer turnover may be difficult and costly to administer, and also do not connect customers as effectively with the shared renewable facility, which is a long-lived asset. **Therefore, decisions about minimum participation term are necessarily affected by decisions about what financing tools and mechanisms are available to LMI customers and facilities, what administrative costs are acceptable, and program goals with respect to customer engagement, and these program design components should be considered together.** IREC does not specify a minimum participation term in the Model Provisions in order to give LMI facilities the flexibility to design subscriptions in light of the financing tools and mechanisms available to them.

²⁷ See Appendix for more information and IREC's CleanCARE proposal to address this particular barrier.

California's Green Tariff Shared Renewables (**GTSR**) Program

In addition to California's multifamily solar programs, California's Green Tariff Shared Renewables (GTSR) program, mandated by legislation (SB 43) in 2013 and approved by the CPUC in early 2015, comprises two different options for customers: a Green Tariff and an Enhanced Community Renewables (ECR) option. Under the Green Tariff option, participants can voluntarily agree to pay their utility a renewable energy rate for half or their entire monthly bill, in order to purchase energy derived from utility-owned solar facilities ranging from 500 kilowatts (kW) to 20 MW. The ECR option is similar to the Green Tariff option but uses energy derived from third-party facilities ranging from 500 kW to 3 MW. The ECR component allows customers to choose from an array of developer-led options, in order to find a program that suits their locational and budgetary preferences and other factors. Unlike California's other programs, the GTSR does not fall under the net metering rules and has a separate statewide participation cap of 600 MW, divided up among the state's IOUs. In addition, the statute requires that, of the 600 MW cap, 100 MW should be reserved for facilities up to 1 MW, which are located in areas identified by the California Environmental Protection Agency to be the most disadvantaged communities.

The utility implementation tariffs were approved by the CPUC in October 2015, and the program is slated to sunset at the end of 2018, according to the statute. However, the CPUC initiated a fourth phase of the rulemaking in Fall 2015 to consider further program design components, including evaluating disadvantaged communities' customer participation.

The credit rate is relatively complex and consists of certain credits and charges, some identified by statute, others by the commission in its rulemaking. The statute also sets a "non-participating ratepayer indifference" requirement, which mandates that non-participants cannot bear any of the costs of the program. ECR costs include: generation rate (varies by facility); ratepayer indifference charge; CAISO and WREGIS grid charges; resource adequacy charge; administrative and marketing charges; and renewables integration cost. ECR credits include: generation credit and a solar value adjustment.

For all three utilities, the rate ultimately is expected to result in a premium cost for participation of at least 2-3 cents per kWh, which most stakeholders expect to substantially dampen interest in the program. While it is too soon to assess the uptake and overall customer response to the program, the premium makes it highly unlikely that any LMI customers will participate in the program. The ongoing rulemaking effort may yield some additional program modifications to better accommodate LMI customers; however, the existing statute language may prevent the program from achieving a meaningful LMI adoption.

Customer Eligibility: Customers located in areas identified by the California Environmental Protection Agency to be the most disadvantaged communities, which are defined and identified by the California Communities Environmental Health Screening Tool Version 2.0 (CalEnviroScreen), which incorporates additional non-income-based criterion, such as environmental and public health, educational, and unemployment levels.

More Information:

- California GTSR Enabling Statute, SB 43 (2013): http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB43
- Green Tariff Shared Renewables CPUC decision: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M145/K819/145819809.PDF>
- CalEnviroScreen 2.0 tool, see <http://oehha.ca.gov/ej/ces2.html>

Finally, although the valuation of bill credits impacts the financial proposition of participation in a program for all customers participating in a shared renewable energy program, LMI customers are likely to be especially sensitive to bill credit valuation, given their income-related barriers. A program that requires participants to pay a premium and does not offer immediate bill savings, such as California's Green Tariff Shared Renewables (GTSR) program, is likely to be unattractive and unviable for most, if not all, LMI customers. IREC's *Model Rules* discuss bill credit valuation in more detail.

B. Ownership Barriers and Split Incentives

Many LMI customers live in rentals, affordable housing, and/or multifamily housing, and these housing arrangements can create split-incentive barriers that impair or prevent their participation in shared renewable energy programs. For example, in multifamily housing where tenants are master-metered, it may be difficult for individuals to participate in shared renewable energy programs without the cooperation of their landlord or the entity responsible for the master meter. Regarding affordable housing specifically, there are additional restrictions and policy challenges related to how energy savings can be translated to direct beneficial impacts on tenants' rents or utility allowances. For example, a low-income tenant living in a multifamily affordable housing unit participating in a shared renewable energy program and receiving benefits on their utility bill (i.e., in the form of credits associated with the renewable energy facility that reduce an individual's monthly bill amount) may not actually see any net savings due to the utility allowance structure, which requires rent plus utilities to be less than 30% of the tenant's monthly income.²⁸ Reductions in the LMI customer's utility bill may result in the housing provider raising the rent by a proportionate amount, such that the total for his or her rent plus utilities remains unchanged. Thus, the LMI customer receives no direct economic benefits from their shared renewable energy participation.

In addition, some programs, such as California's MASH program, may require that the solar facility be installed on-site, on the same multifamily building in which the participants live. In these cases, potential participants may be stymied by disagreements among individual unit owners or tenants regarding the use of shared roof space, as well as challenges associated with split incentives between renters, who would want to install and benefit from a facility via their electricity bills, and landlords, who own the building hosting the facility but would receive no or minimal direct benefit.

²⁸ HUD, Utility Allowances, http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc/allowances ("To keep assisted housing affordable for lower-income households, federal housing law directs that the resident's share of rent in federally assisted public housing should equal 30 percent of the household's adjusted monthly income. In interpreting the federal housing law, HUD has defined the Total Resident Payment for 'rent' to include both shelter and the costs for reasonable amounts of utilities. The amount that a PHA determines is necessary to cover the resident's reasonable utility costs is the utility allowance.").

Additionally, LMI customers are more likely to live in older buildings,²⁹ so their roofs are more likely to need significant repairs to host a solar array on-site. Similarly, these buildings are more likely to need energy efficiency upgrades, which in most cases should be explored prior to installing solar, but can be difficult due to toxins such as asbestos, lead and mold, as well as other challenges that come with retrofitting older housing.³⁰

IREC's LMI Model Provisions address these barriers in at least three ways. First, they specify that an LMI facility may be hosted on-site or located off-site, as a stand-alone facility, to provide the flexibility to avoid some of the barriers that may be associated with shared rooftop systems, including the split incentives between landlords and tenants. Second, they specify that, although the default minimum number of subscriptions in a facility is two, in situations where a multitenant building is master-metered, it may still participate, although the beneficial impact for tenants must be demonstrated, whether it is direct (e.g., tenant bill or other cost savings) or indirect (e.g., overall building savings translated to tenant savings and/or improved tenant services). Alternative shared solar billing mechanisms capable of circumventing the master-meter issue may also be a possible solution to this barrier that warrants further exploration; however, this option is not included in the Model Provisions. Third, within the marketing, education, and outreach section, they specify customer education regarding efficiency and other retrofitting opportunities available to LMI customers, that may make sense to undertake before participation in a shared facility in order to lower the ultimate subscription need and associated cost.

Nonetheless, some barriers, in particular those associated with affordable housing restrictions, may remain since they are dependent on policies outside the scope of shared renewables program design. IREC suggests that policymakers and others be aware of and take these restrictions (and the potential for split incentives) into account when designing programs.

C. Marketing, Education, and Outreach Barriers

Language barriers, lack of Internet access, and constraints on resources and time may prevent many LMI customers from being aware of and/or understanding shared renewables programmatic and financing options. In addition, marketing and education materials are typically not designed with the needs and priorities of LMI customers in mind, and therefore may not effectively speak to the LMI target audience. Moreover LMI customers may be skeptical of novel shared renewables offerings that

²⁹ See, e.g., Joint Center for Housing Studies of Harvard University, *America's Rental Housing: Evolving Markets and Needs* at 19 (2013), available at www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs_americas_rental_housing_2013_1_0.pdf ("Much of the lowest-cost rental stock is at least 50 years old. Nearly half (46 percent) of all unassisted housing with rents under \$400 were built before 1960, compared with just a third of all units. In addition, many of the homes renting in the \$400–599 range were built between 1960 and 1979. Newer housing is much more likely to have higher rents, with 52 percent of unassisted cash rentals built in 1980 or later leasing for at least \$800 a month and just 6 percent renting for less than \$400.")

³⁰ John Snell et al., *Public Health Concerns and Opportunities for Energy Efficiency Upgrades*, ACEEE Summer Study, available at www.aceee.org/library/conference_proceedings/ACEEE_buildings/2000/Panel_8/p8_30/paper ("Many trade-offs can exist between needed improvements and health consequences. Many housing authority buildings are in need of repair, and the substandard conditions that exist, such as leaking roofs, non-controlled temperatures and infestations already threaten health. However, if improvements do not include a health perspective, new upgrades may worsen an already unhealthy situation.")

have not historically been marketed to them, viewing them as potential scams.³¹ **Thus, LMI customers may require specialized, culturally sensitive marketing, education, and outreach, both as far as the method used (e.g., language, medium, etc.) as well as the substance of the materials.**

To address this, the LMI Model Provisions contain a specific [marketing, education and outreach section](#) to ensure that these issues are considered. In addition, the Model Provisions include consumer protection requirements to ensure these customers are appropriately and adequately protected.

In addition, while not necessarily a barrier for customers, the shared renewables program design must specify how customers qualify as “LMI Customers.” In some cases, it may make sense to tie eligibility to an existing program, such as a state or federal assistance program. For example, New York has defined low-income customers as those that are Assistance Program Participants receiving benefits under the Home Energy Assistance Program (HEAP) or a utility-administered low income discount program.³² Alternatively, the regulator or program administrator may need to develop its own certification requirements for LMI eligibility, which may be more costly and labor-intensive, but could better capture the customers the program intends to target. Regardless, customers will need to be appropriately educated regarding eligibility criteria. In addition, the LMI [Model Provisions](#) specify that once eligibility is established, LMI customers should not be required to prove eligibility on an ongoing basis, unless the customer renews or signs a new contract. In this way, although LMI customers must establish their eligibility initially, they are not penalized for no longer having LMI status after committing to a particular participation term, which may be several years.

D. Opportunities for Engagement

Despite these barriers, LMI customers and their communities also have many characteristics that make them excellent partners in cultivating community action, including social capital (e.g., strong social networks), interest in civic engagement, community- and faith-based volunteerism, and the capacity to create innovative solutions to ensure that a shared renewables program meets their needs. **The opportunity is ripe for new public-private partnerships focused on specifically engaging, educating, and conducting targeted outreach to LMI customers regarding shared renewable energy programs.** With dedicated grants and funding sources, organizations already serving LMI communities may be well suited to assist with identifying strategies for engagement and recruitment, to host community workshops or trainings, and/or advise on effective marketing and communications. In an effort to capture this opportunity, the [Model Provisions](#) require Participant

³¹ See, e.g., Erik K. Arnold, New America Media, *Greening the Hood: Is Clean Energy Reaching Power Communities*, <http://newamericamedia.org/2013/11/greening-the-hood-is-clean-energy-reaching-poor-communities.php> (“One of the challenges impacting wider adoption of solar power in low-income neighborhoods . . . is convincing residents ‘they can be part of the green movement’ – a privilege often perceived as reserved for affluent homeowners.”).

³² NY CDG Order, *supra* n.5, at 25-26.

Organizations to partner with community-based organizations, if they are not already community-based organizations themselves.

In addition to the opening for new partnerships, individuals and organizations have also been working in various ways to counteract the perception that LMI communities are not interested in renewable energy, when in fact many are, as demonstrated by outspoken community leadership.³³ LMI customers stand to benefit significantly from renewable energy in their communities. In addition to the widespread environmental benefits associated with renewable energy, which stand in stark contrast to the history of pollution in many of these areas, shared renewable energy installations in LMI communities can bring economic benefits, including local education, skills training, and jobs.³⁴ In addition, they can be implemented in tandem with increased energy efficiency programming.

III. Financing Tools and Mechanisms

As discussed above, economic and financial barriers are some of the most challenging as far as providing for LMI customer access to renewable energy. In addition, lack of knowledge about viable financing options related to renewable energy may exist due to marketing, education, outreach, and cultural barriers. To date, shared renewables programs have paid relatively minimal direct attention to these barriers, however. Even in Colorado and New York, both of which have low-income participation requirements, the burden of figuring out how to integrate low-income customer participants into projects has largely been placed on facility developers; no financial tools and mechanisms are expressly incorporated into these programs. In New York, however, the Low-Income Customer Collaborative is exploring financing tools and other ways to facilitate low-income customer participation in the state's Community Distributed Generation program.³⁵

³³ See, e.g., "Widespread Public Support for Renewable Energy Mandates Despite Proposed Rollbacks," University of Michigan: Issues in Energy and Environmental Policy Appendix 3, (June 2015), <http://closup.umich.edu/files/ieep-nsee-2015-renewable-portfolio-standards.pdf> (when asked whether they agreed with the statement, "State governments should require a set portion of all electricity to come from renewable energy sources such as wind and solar power," 71% of respondents making less than \$20,000 a year either "strongly" or "somewhat" agreed with the statement, while even higher percentages of people agreed with the statement in the \$20,000-\$40,000 and \$40,000-\$60,000 annual income brackets); Katherine Ling, Greenwire, "Community Organizers press for clean power in the inner city" (July 3, 2014), <http://www.eenews.net/stories/1060002346> (discussing a neighborhood church director's efforts to attract solar power development in Baltimore's Sharp-Leadenhall neighborhood).

³⁴ See, e.g., Community Power Network, Low-Income Solar, <http://www.communitypowernetwork.com/node/9486> (summarizing benefits of renewable energy to low-income communities and providing list of organizations working to advance this goal).

³⁵ For more information on the collaborative, see <https://www3.dps.ny.gov/W/PSCWeb.nsf/All/8A75B07F45E1672485257EDD00602D7C?OpenDocument>.

New York Community Distributed Generation Program

In July 2015, New York Governor Cuomo announced the launch of the New York Community Distributed Generation Program (Community DG), set forth by New York Public Service Commission Order, which aims to “provide opportunities for renters, homeowners, low-income residents, schools and businesses to join together to set up shared renewable energy projects resulting in healthier and stronger communities.” The program allows multiple customers to participate in a shared renewable energy facility, and each individual member’s production appears as a credit on their monthly utility bill. Project size limits and customer credit rate are subject to the same regulations as New York’s net metering policy.

The first phase of this program, which runs October 19, 2015 through April 20, 2016, is focused on promoting low-income customer participation and installations in areas of the power grid that can benefit most from local power production (known as Community DG Opportunity Zones). Priority will be given during Phase I to projects that include at least 20% low-income customers, defined as customers receiving benefits under the Home Energy Assistance Program (HEAP) or another utility-administered low-income discount program. Phase 2 of the program, which will begin May 1, 2016, will open the entire utility service territory to Community Distributed Generation projects, with future program changes possible in line with New York’s Reforming the Energy Vision (REV) proceeding. Though not specific to LMI customers, the program has a limited exception to restrictions related to the size of the share a single customer can have for multitenant, master-metered buildings, to allow tenants in those buildings to participate in the Community DG program, despite looking like a single customer (behind a master meter) to the utility.

Given the relative newness of this effort, information on low-income customer participation levels and/or number of qualified low-income projects is limited. While a novel concept to give priority to projects with a minimum threshold of low-income customer participation, the six-month time horizon for this initial phase may prove to be challenging to yield meaningful participation levels, particularly in light of known barriers to low-income customer participation.

Ongoing efforts by the New York Low-Income Customer Collaborative (a commission-mandated multi-stakeholder group, convened by the Division of Public Service) are focused on exploring financing tools and demonstration projects to facilitate low-income customer participation, while also examining obstacles to participation. The collaborative has convened several meetings and is slated to release a report on its findings in April 2016.

Customer Eligibility: An Assistance Program Participant receiving benefits under the Home Energy Assistance Program (HEAP) or a utility-administered low-income discount program.

More Information:

- NY PSC, Order Establishing a Community Distributed Generation Program and Making Other Findings, 15-E-0082 (July 17, 2015), available at <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={76520435-25ED-4B84-8477-6433CE88DA86}> (discussing low-income customer access and establishing the Low-Income Customer Collaborative)
- <https://www.governor.ny.gov/news/governor-cuomo-announces-expanded-access-renewable-energy-millions-new-yorkers>
- Low-Income Customer Collaborative, see <https://www3.dps.ny.gov/W/PSCWeb.nsf/All/8A75B07F45E1672485257EDD00602D7C?OpenDocument>

Fortunately, there are proven tools and mechanisms to address and overcome these barriers, although some of them may involve coordination across programs and/or agencies, as well as coordination with financial institutions, to ensure they can work effectively with a shared renewables program. In these *LMI Guidelines*, IREC describes potential approaches to financing and incentives, many of which are drawn from outside the shared renewables arena but could be incorporated into shared renewables programs. As far as coordination with financial institutions, entities that have traditionally been more likely to focus on community development and environmental benefits, including Community Development Financial Institutions (CDFI)³⁶ and state green banks,³⁷ may be more receptive to participation in the innovative, alternative approaches described below. IREC also recognizes that new financing tools and mechanisms may need to be explored and established, and encourages and welcomes the opportunity for continued collaboration across sectors. Notably, the National Community Solar Partnership has a working group dedicated to finance and business models to encourage expanded collaboration on this important topic.³⁸

The available financing and incentive options fall into two broad categories: those targeting LMI participants and those targeting LMI facilities and LMI participant organizations. In both cases, some incentives may require identification of new funding sources whereas others can rely on shifting or reallocating existing funding streams. **The LMI Model Provision sections regarding financing tools and mechanisms are not prescriptive, in contrast to the majority of the other sections herein (as well as those contained in the *Model Rules*). Rather they offer an array of options to allow a policymaker or other entity to choose the tools that best support particular programmatic goals (e.g., reaching particular subsets of LMI customers), and are feasible within the particular regulatory and political environment.**³⁷ The LMI Model Provisions do specify, however, that a program must implement at least one financing tool or mechanism to facilitate LMI participation. In addition, they specify that the marketing, education and outreach materials for LMI participants must include information regarding the financing opportunities available.

Additionally, as mentioned above, fair bill credit valuation is critical to setting a viable economic foundation for LMI (and non-LMI) customer participation. Bill credit valuation is discussed in more detail in the *Model Rules*. Since the 2013 publication of the *Model Rules*, increasing attention has been paid to the locational benefits of renewable energy generation. Recognizing any locational value associated with a shared renewables facility and incorporating it into the valuation of the associated bill credits can be critical to the financial proposition for participants, especially in the case of LMI facilities and participants.

³⁶ U.S. Dept. of Treasury, Community Development Financing Institutions, www.cdfifund.gov (describing and providing more information about the CDFI program); CDFI Coalition, www.cdfi.org (coalition of CDFIs).

³⁷ Several states have green banks, including Connecticut (www.ctcleanenergy.com), New York (<http://greenbank.ny.gov>), Hawaii (<http://gems.hawaii.gov>), and California (www.treasurer.ca.gov/greenbank).

³⁸ *Supra* n.4.

New York Green Bank

The New York Green Bank (NY Green Bank), a division of the New York State Energy Research and Development Authority (NYSERDA), is a \$1 billion state-sponsored specialized finance entity working in partnership with the private sector to address and alleviate specific gaps and increase investments into New York's clean energy markets, while also creating a more efficient, reliable and sustainable energy system. NY Green Bank is a key component of NYSERDA's proposed Clean Energy Fund (CEF), which in turn is part of New York's Reforming the Energy Vision (REV), the strategy to build a clean, resilient and affordable energy system for all New Yorkers.

The NY Green Bank increases the availability of capital for projects deploying proven clean energy technologies across New York State by leveraging private sector capital at market rates to support and expand clean energy financing markets. The NY Green Bank offers several categories of capital solutions, including credit enhancement, warehousing/aggregation, asset loans and investments, and composite products. The rates provided reflect risk, comparables, and commercial expectations. The process for soliciting capital is done through an on-line request for proposal application process. Current projects in the pipeline include:

- \$20 million (along with a \$50 million warehouse credit facility provided by the global bank, Citi) for Renew Financial to expand its consumer lending program to offer up to 12,000 New York homeowners as much as \$20,000 in low-cost financing for clean energy and energy efficiency improvements to their homes.
- \$25 million, with support from U.S. Bank, to support a new warehouse credit facility for Level Solar – a New York-based solar provider that designs and installs residential solar at no cost to the consumer. Level Solar expects to provide solar for up to 6,000 homes in New York using long-term power purchase agreements.
- \$4 million in revolving construction loans to support distributed wind energy projects for residential, agricultural, and commercial customers throughout the state.

While the current project pipeline does not include any projects devoted to shared renewable energy facilities for LMI customers, the NY Green Bank could foreseeably serve as a source of capital for an LMI-serving shared renewable energy facility (likely one that emerges as part of the New York Community DG Program).

More Information:

- Overview <http://greenbank.ny.gov/About/Overview>
- Investment Portfolio and Pipeline <http://greenbank.ny.gov/Investments/Portfolio-and-Pipeline>
- Request for Proposal Process <http://greenbank.ny.gov/Partnering-With-Us/Propose-an-Investment>

A. Financing Tools and Mechanisms Targeted to LMI Participants

Ultimately, the goals and target customers of a particular program will likely affect its choice of financing tools and mechanisms to facilitate customer participation. For example, low-income customers (e.g., those below 80% of AMI) may require additional upfront incentives, as compared to moderate-income customers (e.g., those between 80% to 120% of AMI), who may benefit from promotion of alternative underwriting criteria or a loan loss reserve program, and not require any additional incentives. Thus, the LMI Model Provisions leave open the possibility of targeting certain tools and mechanisms at subsets of customers.

1. Direct Incentives

Direct incentives can be a transparent and effective way to overcome the financial barriers faced by LMI customers, whether they are used to offset the subscription price to a shared facility, used to augment the bill credit received by participants, or simply paid in cash to the participant (or the LMI Facility or Participation Organization, as discussed below in Section III.B). For example, the successful California MASH program offers incentives to eligible affordable housing host customers installing eligible rooftop solar systems. The incentives have declined over time and vary depending on whether the system offsets mostly common area load (currently \$1.10 per Watt) or tenant load (currently \$1.80 per Watt).³⁹ As of December 16, 2015, 23.9 MW of solar have been installed through the MASH program, with an additional 5.6 MW pending in the program queue.⁴⁰ These incentives are provided through the California Solar Initiative, a ratepayer-funded program. Assembly Bill 693 (Eggman 2015), currently being implemented by the California Public Utilities Commission, establishes a new Solar Roofs Program, similar to MASH, that would rely instead on greenhouse gas allowance revenues and would require systems to provide direct tenants benefits.

IREC's CleanCARE pilot proposal envisions relying on the funding stream associated with California's ratepayer assistance program, California Alternate Rates for Energy (CARE), and redirecting it to invest in shared renewable energy installations for the benefit of CARE customers, thereby eliminating the need for any subscription payments by CARE-eligible participants. Although CleanCARE participants would move to standard residential rates, they would still receive the same or lower electricity bills as they would have under the CARE program via commensurate bill credits from the shared renewable energy facility. [For more detail on IREC's CleanCARE proposal, see the Appendix.](#)

³⁹ MASH Handbook, *supra* n.24.

⁴⁰ California Solar Statistics, Program Totals by Administrator, www.californiasolarstatistics.ca.gov/reports/agency_stats.

California's Multifamily Solar Programs

The California Multifamily Affordable Solar Housing (MASH) program offers incentives to eligible affordable housing host customers installing eligible solar systems on multifamily residential dwellings across the state. MASH emerged from a January 2006 commitment by the California Public Utilities Commission (CPUC) to providing \$2.8 billion for solar incentives over 11 years through the California Solar Initiative (CSI), which also included a set aside 10% of the money for low-income residential customers and affordable housing projects. Later that year, the California Legislature and governor codified that commitment with Senate Bill (SB) 1. To address low-income residential customers and affordable housing projects, the CPUC created the Multifamily Affordable Solar Housing Program (MASH) in October 2008.

The incentives for MASH have declined over time and vary depending on whether the system offsets mostly common area load (currently \$1.10 per Watt) or tenant load (currently \$1.80 per Watt). As of December 16, 2015, 23.9 MW of solar have been installed through the MASH program, with an additional 5.6 MW pending in the program queue. The MASH program requires that all participating facilities involve 100% low-income participants. Utilities credit MASH customer bills through their respective MASH Virtual Net Metering (VNM) Tariffs, which “allow for the allocation of net energy metering benefits from a single solar energy system to all meters on an individually metered multifamily affordable housing property.”

Some have questioned whether all of the MASH participating households that are in HUD-subsidized housing are actually receiving net monthly benefits in the form of a reduced bill, due to utility allowance structure. In HUD-subsidized housing, rent plus utilities is less than 30% of income. In some cases, if utility cost is reduced from VNM credits, the proportion of rent can increase to potentially render no net monthly financial benefit to the household.

With the termination of the California Solar Initiative, the primary funding source for MASH, Assembly Bill 693 (Eggman 2015) is currently being implemented by the California Public Utilities Commission and establishes a New Multifamily Affordable Housing Solar Roofs Program. The program is similar to MASH, in that it will provide incentives for rooftop solar systems installed on multifamily housing and requires the solar systems to provide direct tenants benefits, presumably through on-bill credits or some other mechanism to be determined through rulemaking. The bill commits \$100 million per year, over 10 years – from the electricity sector's Greenhouse Gas Option Revenues – to pay for solar systems on qualified low-income properties, to the benefit of the property's tenants. The goal of the policy is to install 300 megawatts of rooftop solar on multifamily affordable housing projects through 2030. The provision to provide direct tenant benefits is intended in part to address the aforementioned split-incentive resulting from the utility allowance structure. The CPUC is expected to initiate a rulemaking on AB 693 in 2016. AB 693 was supported broadly by environmental justice organizations, low-income housing advocates, environmental groups, and solar companies.

continued

California's Multifamily Solar Programs *continued*

Customer Eligibility:

The MASH program requires that all participating facilities involve 100% low-income participants, and the projects must be residential, multi-family retrofits (i.e., new construction not eligible). The following criteria are used to determine MASH program eligibility:

Pub. Util. Code § 2852.a.3 defines “low-income residential housing” as one of the following:

Multifamily residential complex financed with one or more of the following:

- low-income housing tax credits
- tax-exempt mortgage revenue bonds
- general obligation bonds
- local, state, or federal loans or grants

AND for which either of the following applies:

- the rents of the occupants who are lower income households do not exceed those prescribed by deed restrictions or regulatory agreements pursuant to the terms of the financing or financial assistance; or
- the affordable units have been or will be initially sold at an affordable housing cost to a lower income household, and those units are subject to a resale restriction or equity sharing agreement pursuant to the terms of the financing or financial assistance.

Multifamily residential complex in which at least 20% of the total housing units are sold or rented to lower income households AND either of the following applies:

- the rental housing units targeted for lower income households are subject to a deed restriction or affordability covenant with a affordable housing provider organized under Section 501(c)(3) of the Internal Revenue Code; or
- the housing units have been or will be initially sold at an affordable cost to a lower income household, subject to resale restrictions.

The New Multifamily Affordable Housing Solar Roofs Program statute defines “Qualified Multifamily Affordable Housing Property” as a multifamily residential building of at least five rental housing units that is operated to provide deed-restricted low-income residential housing, as defined in Pub. Util. Code § 2852.a.3, and that meets one or more of the following requirements:

- The property is located in a disadvantaged community, as identified by the California Environmental Protection Agency pursuant to Section 39711 of the Health and Safety Code.
- At least 80 percent of the households have incomes at or below 60 percent of the area median income, as defined in subdivision (f) of Section 50052.5 of the Health and Safety Code.

The CPUC may promulgate more refined rules regarding the eligible customer definition in the forthcoming rulemaking to implement the statute.

continued

California's Multifamily Solar Programs *continued*

More Information about MASH:

- *California Public Utilities Commission Multifamily Affordable Solar Housing Program Handbook* (1st ed. 2015) (Program Overview and MASH Program Participants), available at www.gosolarcalifornia.ca.gov/documents/MASH_Handbook.pdf
- California Solar Statistics, Program Totals by Administrator, www.californiasolarstatistics.ca.gov/reports/agency_stats.
- CPUC Decision 11-07-031 to expand NEM-V: http://docs.cpuc.ca.gov/PublishedDocs/PUBLISHED/FINAL_DECISION/139683-03.htm#P144_30608
- CPUC Decision 08-10-036 to adopt VNM for the MASH program: http://docs.cpuc.ca.gov/published/FINAL_DECISION/92455-07.htm#P237_52694
- Pacific Gas & Electric NEM-V and VNM Tariffs: http://www.pge.com/tariffs/tm2/pdf/ELEC_SCHS_NEMV.pdf
- http://www.pge.com/tariffs/tm2/pdf/ELEC_SCHS_NEMVMASH.pdf
- Southern California Edison NEM-V and VNM Tariffs: <https://www.sce.com/wps/portal/home/residential/generating-your-own-power/virtual-net-metering/>
- San Diego Gas and Electric NEM-V and VNM Tariffs: <https://www.sdge.com/sites/default/files/documents/674682198/VirtualNetMetering.pdf>
http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHS_NEM-V.pdf
http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHS_VNM-A.pdf

More Information about AB 693:

- Assembly Bill 693, AB 693, Eggman. Multifamily Affordable Housing Solar Roofs Program. https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB693
- AB 693 Fact Sheet from California Environmental Justice Alliance <http://caleja.org/wp-content/uploads/2015/07/AB693.FactSheet.pdf>

While ratepayer assistance funds are an important funding source to consider, diverting them can be a sensitive issue and ensuring LMI customers are protected is paramount. Conceivably, incentives for a program structured similarly to [CleanCARE](#) could be funded through a different funding stream instead, although obtaining additional funding for incentives can also be difficult. Indeed, one key downside to a shared renewables program relying on direct incentives is the uncertainty that often surrounds continued funding, as well as the direct dependency of the level of capacity on the incentives, which detracts from the ability to scale up the program. Therefore IREC suggests that programs should consider one or more additional financing tools or mechanisms to support LMI shared renewables programs.

2. Loan Programs and Credit Enhancements

Because many LMI customers do not have adequate credit, traditional loans often are not an option for them. However, innovative loan mechanisms that rely on credit enhancements can help overcome these credit-related barriers and allow LMI customers to take advantage of loans that can defray the upfront costs of participating in a shared renewable energy facility. Both loan loss reserve mechanisms and on-bill financing are two potential ways this might be achieved.

Loan Loss Reserve Mechanism

A loan loss reserve is a fixed or renewable account that contains funds set aside to cover losses incurred over the life of the loan. In other words, the loan loss reserve account mitigates the risk that a loan may not be paid back. For example, the Mass Solar Loan Program in Massachusetts offers low-interest loans of between \$3,000 and \$35,000 to income-eligible state residents interested in purchasing and installing renewable energy systems on their own homes, or those interested in subscribing to a community solar project. Rather than a single reserve account, the program establishes loan loss reserves for each lender that participates in the program.⁴¹ In this way, the Mass Solar Loan program mitigates the credit risk associated with LMI customers, and allows these customers to obtain loans to support their subscriptions to shared renewables facilities, while simultaneously building a positive credit history.

On-Bill Financing and Repayment

Although not popular among all utilities, on-bill financing and on-bill repayment have historically been used successfully to help customers finance energy efficiency improvements.⁴² Financial institutions pay the upfront costs of these improvements in an arrangement comparable to a loan, and participants in on-bill programs repay most or all of the costs over time via their utility bills. Because customers ultimately repay the costs, on-bill financing can be more attractive than traditional direct incentive (e.g., rebate) programs funded by ratepayers or taxpayers, while still addressing critical financial barriers, including long payback periods and insufficient credit. For example, New York's Green Jobs – Green New York program offers an On-Bill Recovery Loan for energy efficiency improvements and on-site solar installations that allows for residential participants to have credit scores as low as 540.⁴³

⁴¹ Mass. Clean Energy Center, Mass Solar Loan, www.masscec.com/programs/mass-solar-loan.

⁴² See U.S. DOE, On-Bill Financing and Repayment Programs, <http://energy.gov/eere/slsc/bill-financing-and-repayment-programs>; SEE Action, Financing Solutions Working Group, *Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators* (2014), available at https://www4.eere.energy.gov/seeaction/system/files/documents/onbill_financing.pdf [hereinafter SEE Action Report].

⁴³ New York: Green Jobs-Green New York Financing Program for Photovoltaic (PV) and Solar Thermal Installations, www.energyfinancesolutions.com/main/homeownersnyphotovoltaic/title/New%20York; see also Green Jobs – Green New York, www.nyscrda.ny.gov/About/Green-Jobs-Green-New-York (program home page).

Massachusetts Solar Loan Program

In December 2015, the Massachusetts Department of Energy Resources (DOER) and the Massachusetts Clean Energy Center (MassCEC) launched the Mass Solar Loan, which is a \$30 million low-income solar loan program. Through the program, lenders offer 10-year fixed-rate low-interest loans of between \$3,000 and \$35,000 to income-eligible state residents, including renters and those with moderate incomes or low credit scores, interested in purchasing and installing renewable energy systems on their own homes, or those interested in subscribing to a community solar project. The program is financed with Alternative Compliance Payments from the Department of Energy Resources. To make the process more streamlined for customers, the program pre-qualifies solar installers and lenders and provides a list of all providers on the website (www.masscec.com/programs/mass-solar-loan).

The Mass Solar Loan Program includes three incentives to help Massachusetts residents go solar, including:

- An Interest Rate Buy Down (which reduces the annual interest rate by 3% below the typical rate charged by participating lenders). This Interest Rate Buy Down is available to all solar system owners regardless of income.
- A loan loss reserve, which functions as an incentive for lenders to help customers with lower credit scores go solar. Rather than a single reserve account, the program establishes a loan loss reserve for each lender participating in the program.
- Income-based loan support is available for consumers with annual household incomes \$80,240 and below; under this scenario, the Mass Solar Loan program pays a portion of the loan principal (20% or 30% of the loan, depending on income) upon project completion.
- The Loan Loss Reserve program mitigates the credit risk associated with LMI customers, and allows these customers to obtain loans to support their subscriptions to shared renewables facilities, while simultaneously building a positive credit history.

Customer Eligibility: Eligibility is based on income (annual household incomes \$80,240 and below) and credit scores. Customers provide their tax information to a third-party income verifier via a secure online form.

More Information:

- Massachusetts Clean Energy Center, Mass Solar Loan www.masscec.com/programs/mass-solar-loan

From a participating customer's perspective, on-bill programs can be attractive because the bill savings associated with the energy efficiency improvement can offset any additional charges on the bill associated with the on-bill repayment, so they do not see increased electricity costs and, in fact, may see their bills decrease. In addition, since customers are familiar with paying their monthly utility bill, on-bill financing can be less confusing for participants with respect to the impact on their monthly finances and how repayment will work. Proponents also suggest that administrators of on-bill financing programs may experience lower default rates due to the perceived threat of discontinued service for defaulting.⁴⁴

Grand Valley Power's Low-Income Community Solar Program, launched in partnership with GRID Alternatives, offers an example of a shared renewables program successfully utilizing on-bill financing in practice.⁴⁵ The program offers a zero-interest, five-year on-bill financing option with no qualification requirements for any utility member, which costs participants \$15 per month. This option was introduced as a way to increase program participation and was found to be an important component to its success.

3. Other Credit Assistance

As discussed above in [Section II](#), lack of credit and poor credit ratings serve as major financial barriers to LMI customer access to renewable energy. Customers with access to affordable credit can take out loans or take advantage of other mechanisms that can defray the upfront costs of investing in on-site generation or, in the case of shared renewables, a subscription in a shared facility. Although some LMI customers may have a low risk of default, they are unattractive to lenders or program administrators because they do not satisfy the metrics associated with traditional underwriting criteria, such as the customer's debt-to-income ratio or credit score. For example, the Illinois Energy Efficiency Loan uses a traditional set of underwriting criteria and has managed to hold its default rate at zero percent, however, its underwriting criteria have resulted in a customer application decline rate of 49%.⁴⁶

Expanded, alternative, or hybrid methods of credit assessment may be a better indicator of an individual's risk of default in the context of shared renewable energy programs. In addition, expanded, alternative, or hybrid underwriting criteria could be used in tandem with other financing mechanisms involving repayment, such as the loan programs described above. In any of these cases, a program should be clear about who bears the risk of LMI customer default (e.g., developer, anchor subscriber, etc.) and how payment would be recouped.

⁴⁴ SEE Action Report, *supra* n.42 at 1.

⁴⁵ SEPA, *Solar Success for Non-Profit Utilities: Grand Valley Power's Low-Income Community Solar Program* (2015), available at www.solarelectricpower.org/media/378380/solarops-case-study-grand-valley-power-low-income-community-solar-program.pdf.

⁴⁶ SEE Action Report, *supra* n.4242 at 42.

Grand Valley Power and GRID Alternatives – Low-income Community Solar Projects

Non-profit organization GRID Alternatives Colorado (GRID) and a Colorado Rural Electric Cooperative, Grand Valley Power (GVP), are partnering to build a 24 kilowatt (kW-ac) photovoltaic (PV) system dedicated to low-income customers in GVP's service territory. By combining a low-cost build model with the community solar program model, GVP and GRID are creating an innovative way to provide low-income energy assistance, including utilizing equipment donations from solar manufacturers, financial contributions from a variety of sources, and labor from job training programs and volunteers to build the solar,

Participating community solar customers receive net metering bill credit for four years, after which time the block of panels is assigned to another qualifying household for four more years, which continues through the 20-year program life. The project is estimated to serve approximately 35 families total. The average system size for each participating family is approximately 3.5 kW-ac, although each system is sized to around 90% of annual electricity consumption. Each household is expected to save approximately \$600 in electricity costs each year for the four years. There is no upfront cost to participants, though there is a 2 cent/kWh participant fee, which is split between GVP and GRID to defray management costs.

The program offers a zero-interest, five-year on-bill financing option with no qualification requirements for any utility member, which costs participants \$15 per month. This option was introduced as a way to increase program participation and was found to be an important component to the success of the program.

GRID's low-income shared solar demonstration projects are supported by a \$1.2 million grant from the Colorado Energy Office. Cumulatively, GRID anticipates over 1 Megawatt of new installed solar capacity, which will serve and provide benefits to at least 300 low-income families in Colorado.

Customer Eligibility: Participants must be at 80% or less of the area median income to qualify, or \$48,550 for a family of four in Mesa County in 2015. Eligible participants are vetted by Housing Resources of Western Colorado, a Colorado non-profit that provides energy efficiency services to low-income households, such as energy audits, insulation, windows, lighting, and updated furnaces. Community solar participants may still be eligible for the energy efficiency services as well if they also separately qualify.

More Information:

- Grid Alternatives Colorado Community Solar Program <http://www.gridalternatives.org/regions/colorado/about/community-solar#sthash.IZnlFgGH.dpuf>
- Solar Electric Power Association. Solar Success for Non-Profit Utilities, Grand Valley Power's Low-Income Community Solar Program. 2015. Available at: <https://www.solarelectricpower.org/media/378380/solarops-case-study-grand-valley-power-low-income-community-solar-program.pdf>
- Colorado Energy Office, Press Release, "Colorado Energy Office awards \$1.2 million grant funding to GRID Alternatives for low-income solar project" Issued August 27, 2015. Available at: <https://www.colorado.gov/pacific/sites/default/files/atoms/files/CEO%20Grant%20to%20GRID%20Alternatives%20for%20Low-income%20Solar%20Project.pdf>

Expanded Underwriting Criteria

Expanded underwriting criteria involve the same or similar metrics as traditional underwriting, however, the minimum threshold for each metric is reduced in order to increase the number of eligible and approved participants. For example, a lender or program relying on expanded underwriting criteria may approve someone with a credit score of less than 600, who would otherwise not be approved under traditional underwriting standards. The Tennessee Valley Authority (TVA) uses expanded underwriting in their on-bill financing program with an application approval of 75% and a default rate of only 3%.⁴⁷

Alternative Underwriting Criteria

In the case of alternative underwriting criteria, financial metrics other than those traditionally used, such as current or past utility-bill repayment history, are considered in an effort to increase the number of eligible and approved consumers, without increasing the overall risk substantially. For example, Connecticut Light & Power and United Illuminating's Small Business Energy Advantage loan program considers businesses' outstanding utility bill balances and bill repayment history rather than traditional metrics. This program boasts an application approval rate of 95% and a default rate of less than 1%. It is important to note, however, that its success among commercial customers may not be indicative of the same level of success among residential customers.⁴⁸

Hybrid Underwriting Criteria

As the name suggests, hybrid underwriting criteria combine both traditional and alternative metrics to determine a consumer's eligibility to participate in a program. For example, the Clean Energy Works Oregon program, now named Enhabit, which provides outreach, education, incentives, and financing to encourage Oregon residents to improve the efficiency of their homes, checks an applicant's credit score but also uses utility bill repayment history to assess the applicant. Administrators of this program use a point system to weigh different consumer actions, such as receiving a delinquency notice versus a disconnection notice.⁴⁹

⁴⁷ SEE Action Report, *supra* n.42 at 42.

⁴⁸ SEE Action Report, *supra* n.42 at 42-43.

⁴⁹ LBNL, Clean Energy Financing Policy Brief, Alternative Underwriting Criteria—Using Utility Bill Payment History as a Proxy for Credit: Case Study on Clean Energy Works Oregon (2012), available at <http://eetd.lbl.gov/sites/all/files/publications/mi-policybrief-4-4-2012c.pdf>.

B. Financing Tools and Mechanisms Targeted to LMI Facilities and LMI Participant Organizations

As discussed above in [Sections I and II](#), the definition of an eligible LMI facility relates closely to the financing mechanisms and tools available to make the LMI facility economically viable. **With respect to the tools and mechanisms available directly to LMI facilities, it may make sense to tie them expressly to the percentage of LMI participants the LMI facility serves. That is, if a facility serves 100% LMI participants, it may be eligible for higher incentives or more attractive loans than a facility serving only 20% LMI participants.** The availability of these tools and mechanisms to LMI facilities may lower costs such that facilities could decrease the subscription price or offer discounted subscriptions to LMI participants, whether participants subscribe on a capacity (kW) or energy (kWh) basis. Alternatively, depending on the circumstances, it may also be possible for facilities to offer a no-money-down, pay-as-you-go energy (kWh) option, requiring no upfront purchase or commitment.

Again, IREC describes an array of financing tools and mechanisms for participants, facilities and participant organizations; we suggest balancing the availability of these tools and mechanisms with other program design parameters, including in particular the eligibility criteria for an LMI facility.

1. Anchor Subscribers and Back-up Guarantees

Especially in the face of limited or no additional incentives, larger, “anchor” subscribers can be critical to allowing for LMI customer participation in a shared renewable energy facility. Essentially, these anchor subscribers, typically commercial or industrial customers, can shoulder all or a larger portion of the subscription costs, potentially in exchange for other benefits, such as the marketing value associated with their participation. By doing so, they can lower or even eliminate subscription costs for LMI participants.

Anchor subscribers may also provide a back-up guarantee in the event of LMI participant default. Facility developers typically bear the risk of participant default and an increased risk (such as a significant percentage of LMI participants with lower credit scores), which can make facility financing difficult and expensive, if not impossible to obtain. An anchor subscriber, in particular one with good credit, can help to assuage financiers’ concerns regarding repayment and default, especially in instances when the anchor subscriber subscribes to a larger percentage of the facility and LMI participants make up only a smaller percentage. To give a concrete example, an anchor subscriber may subscribe to 30% of an LMI facility but agree to subscribe to an additional 10% (40% total) should LMI participants default. **As discussed above and in [Section II](#), to the extent anchor subscribers and back-up guarantees are relied on as the primary or only financing tool to facilitate LMI customer participation, it may be necessary to allow for a smaller percentage of LMI participants in proportion to non-LMI participants.**

2. Direct Incentives

Similar to direct incentives targeted to LMI customers, LMI facilities or participant organizations may also receive direct incentives, which in turn can allow them to charge their LMI participants lower or no subscription prices. In some cases, a program, such as California’s MASH program, may be designed to allow LMI customers to pass through their incentive fairly easily to the LMI facility. In other cases, incentives may be exclusively available to the LMI facility or participant organization, perhaps through state clean energy funds or other state-allocated funds for clean energy or other green projects. For example, projects participating in New York’s community distributed generation program are eligible for incentive funding through the NY-Sun, although specific incentives for LMI projects have not been allocated.⁵⁰

In addition, a state may increase the value associated with renewable energy credits (RECs) or solar RECs (SRECs) associated with a shared renewables system as a way to directly incentivize shared renewables development. For example, Massachusetts allows facilities that meet its definition of “community shared solar” or that, whether on-site or community sited, “provide all of their generation output in the form of electricity or net metering credits to low or moderate income housing” as defined by state law, to receive the highest SREC multiplier available (1.0).⁵¹ Theoretically a state could implement a multiplier specific to shared renewables facilities serving LMI customers.

3. Tax Incentives

Although LMI participants typically cannot take advantage of tax incentives, LMI facilities may be able to do so, and use them to drive down the costs of facilities and their associated subscriptions. In addition to the federal, state and local tax incentives (and accelerated depreciation) that may be available for renewable energy generally, such as the federal Investment Tax Credit (ITC), there may be tax incentives geared toward LMI renewable energy and/or LMI customers or communities more generally.

NY SUN Affordable Solar

As part of Governor Cuomo’s New York-Sun (NY-SUN) initiative, Affordable Solar is authorized to spend \$13 million to achieve greater participation by low- to moderate-income customers in solar electric programs. The double incentives for low- to moderate-income homeowners will use approximately half of that funding. The other half will be used in the future to support shared solar projects for renters and others who do not have rooftops or who have rooftops that are unsuitable for solar. Details on the shared solar component are still forthcoming.

More Information:

- New York Sun Initiative <http://ny-sun.ny.gov/Get-Solar/Community-Solar>

⁵⁰ NY-Sun, NY-Sun Brings Solar to Your Community, <http://ny-sun.ny.gov/Get-Solar/Community-Solar>.

⁵¹ 225 CMR 14.05(9)(l); MA DOER, SREC Factor Guideline, available at www.mass.gov/eea/docs/doer/rps-aps/srec-factor-guideline.pdf.

For example, several non-profits in New Jersey were able to work with corporate investors to leverage the federal New Markets Tax Credit (NMTC) to secure low-cost private capital funding and below-market energy costs (outside of the shared renewables context).⁵² The goal of the NMTC program is to attract private capital into low-income communities by permitting individual and corporate investors to receive a tax credit (39% of the original investment amount over a period of seven years) against their federal income tax in exchange for making equity investments in specialized financial intermediaries called Community Development Entities (CDE).⁵³ Unfortunately, the NMTC expired at the end of 2014, but it nonetheless serves as a good example of the potential for tax incentives to support innovative financing arrangements for renewable energy, including shared renewable energy facilities. In addition, in situations where non-profits and other entities that cannot directly take advantage of the federal ITC, facilities likely need to be large enough—anecdotally, at least 500 kilowatts—to justify the transaction costs of leveraging the ITC through a third-party partner.

4. Loan Programs and Credit Enhancements

Similar to LMI customers, LMI facilities may have difficulty securing financing, including loans, because of concerns about potential loan default. In addition to the loan loss reserve mechanism described above in [Section III.A](#), projects may be able to take advantage of other innovative loan programs that rely on credit enhancements, including Property Assessed Clean Energy (PACE) programs and revolving loan funds.

Property Assessed Clean Energy (PACE) Programs

At a basic level, PACE programs allow governmental entities to fund the upfront cost of renewable energy projects and other energy improvements, and residential and commercial property owners to pay back the costs of those projects via property taxes.⁵⁴ In the first example of PACE financing approved by HUD for a HUD-assisted public housing property, the Washington, DC's PACE program recently announced \$700,000 in financing to add solar and energy efficiency upgrades to an affordable housing complex.⁵⁵ Although IREC is not currently aware of shared renewable energy projects relying on PACE financing—perhaps because in at least some states the interest rates currently offered by the PACE program are higher than those offered by CDFIs and some other banks—it may still be possible for projects installed on residential or commercial properties to take advantage of the programs. A DOE-funded project is currently exploring ways in which to extend the PACE model to tax-exempt entities, such as affordable housing.⁵⁶

⁵² Stephen B. Pearlman, *Solar Financing for Nonprofits: the BCCAP Model*, New Jersey Law Journal, Vol. 209, Iss. 10 (Aug. 29, 2012).

⁵³ U.S. Dept. of Treasury, CDFI Fund, New Markets Tax Credit Program, www.cdfifund.gov/programs-training/Programs/new-markets-tax-credit/Pages/default.aspx; see also New Markets Tax Credit Coalition, New Markets Tax Credit Fact Sheet, <http://nmtccoalition.org/fact-sheet>.

⁵⁴ U.S. DOE, Property-Assessed Clean Energy Programs, <http://energy.gov/eere/slsc/property-assessed-clean-energy-programs>.

⁵⁵ Silvio Marcacci, DC Project May Unlock PACE Funding For Affordable Housing Across US, <http://cleantechnica.com/2015/11/13/dc-project-may-unlock-pace-funding-affordable-housing-across-us>.

⁵⁶ U.S. DOE, Solar Market Pathways, <http://energy.gov/eere/sunshot/solar-market-pathways> (project by The Solar Foundation).

Revolving Loan Funds

Revolving loan funds have historically been used to reach entities that do not qualify for traditional financing because they are viewed as “high risk,” and could be used similarly to reach LMI facilities. These funds begin with a seed fund that is continually replenished as individual projects pay back their loans, allowing the revolving loan fund to issue loans to new projects. For example, the Iowa Energy Center has an Alternate Energy Revolving Loan fund, which provides loans based on both the technical merit of a project and the financial qualifications of the applicant, and requires applicants to obtain matching financing from another lender.⁵⁷ Similarly, an organization, RE-volv, relies on a donation-based “Solar Seed Fund” to finance solar energy systems installed on non-profits’ buildings and cooperatives under a lease model.⁵⁸

5. Low-Cost Public Financing

LMI facilities may be able to make use of low-cost public financing, such as government bonds, to drive down the price of their facility, especially if they are sited on governmental property and/or benefit governmental entities. For example, “green bonds” are becoming an increasingly popular way for states and local governments to provide funding for green projects, including renewable energy projects.⁵⁹ The governmental entity issuing the green bond agrees to use the proceeds of the sale to fund projects that are beneficial to the environment, and investors are paid interest and principal from the same revenues as other municipal bonds. For example, Massachusetts issued a green bond to help fund the construction of a marine terminal, which will be designed to support the construction of offshore wind energy projects.⁶⁰ Conceivably governments could issue green bonds to support LMI shared renewables, as well. In addition, various other funding sources for solar development are available to public entities, including, for example, Clean Renewable Energy Bonds (CREBs),⁶¹ U.S. Department of Agriculture Energy Efficiency and Conservation Loan Program (EECLP),⁶² and financing opportunities associated with the federal Community Reinvestment Act.⁶³

⁵⁷ Iowa Energy Center, Alternate Energy Revolving Loan Program (AERLP), www.iowaenergycenter.org/alternate-energy-revolving-loan-program-aerlp.

⁵⁸ RE-volv, <http://www.re-volv.org>.

⁵⁹ Mike Cherney, *Massachusetts Goes Greener with Latest ‘Green Bond’ Sale*, Wall Street Journal, MoneyBeat (Sept. 17, 2014), <http://blogs.wsj.com/moneybeat/2014/09/17/massachusetts-goes-greener-with-latest-green-bond-sale>.

⁶⁰ Van Hilderbrand, *Transforming the Traditional Municipal Bond Market to Finance Environment-Friendly Green Projects*, Energy Finance Report (Sept. 26, 2014), www.energyfinancereport.com/2014/09/transforming-the-traditional-municipal-bond-market-to-finance-environment-friendly-green-projects.

Footnotes continued on next page

⁶¹ U.S. DOE, Clean Renewable Energy Bonds, <http://energy.gov/savings/clean-renewable-energy-bonds-crebs> (CREBs “may be used by certain entities—primarily in the public sector—to finance renewable energy projects. . . . CREBs may be issued by electric cooperatives, government entities (states, cities, counties, territories, Indian tribal governments or any political subdivision thereof), and by certain lenders. The bondholder receives federal tax credits in lieu of a portion of the traditional bond interest, resulting in a lower effective interest rate for the borrower. The issuer remains responsible for repaying the principal on the bond.”)

⁶² USDA, Energy Efficiency and Conservation Loan Program, www.rd.usda.gov/programs-services/energy-efficiency-and-conservation-loan-program (“With the EECLP, eligible utilities [those that have direct or indirect responsibility for providing retail electric service to persons in a rural area], including existing Rural Utilities Service borrowers, can borrow money tied to Treasury rates of interest and re-lend the money to develop new and diverse energy service products [including distributed generation] within their service territories.”).

⁶³ Board of Govs. of the Fed. Reserve Sys., Community Reinvestment Act, www.federalreserve.gov/communitydev/cra_about.htm (“The Community Reinvestment Act is intended to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low- and moderate-income neighborhoods, consistent with safe and sound operations.”); National Community Reinvestment Coalition (NCRC), Community Reinvestment Act Q&A, www.ncrc.org/programs-a-services-mainmenu-109/policy-and-legislation-mainmenu-110/the-community-reinvestment-act-mainmenu-80/community-reinvestment-act-q-a-a-mainmenu-159 (“CRA is a federal law that imposes an affirmative obligation on banks to serve the credit needs of low- and moderate-income communities and to take steps to provide equal access to responsible financial products and services to traditionally underserved populations. Thanks to CRA, banks have actively promoted housing and economic opportunity for underserved groups by providing affordable mortgage programs, small business loan products, community development financing, funding for non-profit housing and economic development programs, etc.”).

IV. LMI Model Provisions for Shared Renewable Energy Programs

As indicated at the outset, these *LMI Guidelines* and accompanying LMI Model Provisions are intended to function in tandem with IREC's *Model Rules for Shared Renewable Energy Programs*. For policymakers, regulators and other entities using and refining these LMI Model Provisions, IREC emphasizes that coordination with customer advocates, especially LMI customer advocates, environmental and environmental justice advocates, and others will be critical, as well as coordination with renewable energy industry and utility representatives. This variety of perspectives is needed to ensure the program successfully reaches the LMI customers it is targeting to the degree it hopes to do so, and that LMI customers are appropriately protected.

Likewise, IREC encourages policymakers and others to think carefully about the overarching goals of the program prior to designing the program and any financing components. In turn, these goals will dictate how the program is evaluated, and ultimately whether or not the program is considered successful.

The following LMI Model Provisions are designed to work in concert with *IREC's Model Rules for Shared Renewable Energy Programs*, and serve as IREC's recommendations for state, local and utility programs that aim to provide more equitable access to shared renewable energy. The Model Provisions should be modified as needed to comport with state and local laws and programs.

I. DEFINITIONS

Consistent with the definitions in IREC's *Model Rules for Shared Renewable Energy Programs*, the following definitions apply to this section:⁶⁴

- a) **"Bill Credit"** means the monetary value of the kilowatt-hours (kWh) generated by the Shared Renewable Energy Facility allocated to a Participant to offset that Participant's electricity bill.
- b) **"Biomass"** means a power source that is comprised of, but not limited to, combustible residues or gases from forest products manufacturing; waste, byproducts, or products from agricultural and orchard crops; waste or co products from livestock and poultry operations; waste or byproducts from food processing, urban wood waste, municipal liquid waste treatment operations, and landfill gas.
- c) **"Electricity Provider"** means the entity providing electricity service to Participants.
- d) **"Eligible LMI Shared Renewable Energy Facility"** or **"LMI Facility"** means a Shared Renewable Energy Facility that credits at least 60% of its Bill Credits to the utility bills of

⁶⁴ Current terms from the *Model Rules* have been incorporated along with new terms specific to LMI programs.

LMI Customers. An LMI Shared Renewable Energy Facility may be located either as a stand-alone facility, called herein a stand-alone LMI Facility, or behind the meter of an LMI Facility Participant, called herein a hosted LMI Facility. An LMI Facility must have at least two LMI Facility Participants; provided, however, that LMI Customers living in a multitenant building that is master-metered may be considered individual LMI Facility Participants for the purposes of this program, so long as direct and/or indirect LMI Customer benefits are demonstrated.

- e) **“Energy Conservation Improvement”** means any material energy efficiency improvement implemented at the residence of an LMI Facility Participant.
- f) **“Household”** has the meaning set forth by the U.S. Census Bureau.⁶⁵
- g) **“Locational Benefits”** means the benefits accruing to the Electricity Provider due to the location of the Shared Renewable Energy Facility on the distribution grid. Locational Benefits include such benefits as avoided transmission and distribution system upgrades, reduced transmission and distribution level line losses, and ancillary services.
- h) **“Low-Income Customer”** means a residential retail customer of an Electricity Provider who:
 - i. Qualifies, or whose Household qualifies, for any means-based form of state or federal low-income assistance such as Medicaid, the Low-Income Home Energy Assistance Program or the Supplemental Nutrition Assistance Program; and/or
 - ii. Has an annual Household income of 80% or less of the federal Department of Housing and Urban Development (HUD) Area Median Income (AMI).
- i) **“Low- to Moderate-Income (LMI) Customer”** means a residential retail customer of an Electricity Provider who:
 - i. Meets the definition of Low-Income Customer and/or Moderate-Income Customer; and/or
 - ii. Resides within a locally, state- or federally recognized “disadvantaged community,” whose definition shall include both socioeconomic and environmental pollution factors.
- j) **“LMI Facility Participant”** means:
 - i. A residential, retail LMI Customer of an Electricity Provider who owns an LMI Subscription and who has identified one or more individual meters or accounts to which the Subscription shall be attributed; provided, however, that these individual meters or accounts shall be within the same Electricity Provider’s distribution service territory as the LMI Facility; or
 - ii. An eligible, non-LMI Participant; provided, however, that 60% of the Participants in the LMI Facility are LMI Customers.

⁶⁵ “A household includes all the people who occupy a housing unit. (People not living in households are classified as living in group quarters.) A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other people in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people who share living arrangements.” U.S. Census Bureau, American Community Survey and Puerto Rico Community Survey: 2014 Subject Definitions, http://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2014_ACSSubjectDefinitions.pdf.

- k) **“LMI Participant Organization”** means a Participant Organization whose purpose is to beneficially own and operate an LMI Facility for the LMI Facility Participants.
- l) **“LMI Subscription”** means an interest in an LMI Facility held by an LMI Customer. Each LMI Subscription shall be sized to represent at least one panel in the LMI Facility; provided, however, that the LMI Subscription is sized to produce no more than 120% of the LMI Customer’s average annual electrical consumption.
- m) **“Moderate-Income Customer”** means a residential, retail customer of an Electricity Provider who has an annual Household income of 80% to 120% of the HUD AMI.
- n) **“Participant”** means a retail customer of a utility who owns a Subscription and who has identified one or more individual meters or accounts to which the Subscription shall be attributed. Such individual meters or accounts shall be within the same Electricity Provider’s distribution service territory as the Shared Renewable Energy Facility.
- o) **“Participant Organization”** means an organization whose purpose is to beneficially own and operate a Shared Renewable Energy Facility for the Participants of the Shared Renewable Energy Facility. A Participant Organization may be any for-profit or non-profit entity permitted by [state] law. The Shared Renewable Energy Facility may also be built, owned, and operated by a third party under contract with the Participant Organization.
- p) **“Partner Organization”** means a community-based or other organization that has proven experience administering programs for the benefit of LMI Customers, such as those organizations that administer weatherization, LMI housing, or LMI-specific energy efficiency and renewable energy programs.
- q) **“Program Implementing Agency”** means the regulatory agency or other entity that creates and approves rules for LMI Facilities, including state commissions, electric cooperative boards, municipal councils or other such entities.
- r) **“Renewable Energy Certificate”** or **“REC”** means a tradable instrument that includes all renewable and environmental attributes associated with the production of electricity from a Shared Renewable Energy Facility.
- s) **“Renewable Energy Generation”** means an electrical energy generation system that uses one or more of the following fuels or energy sources: Biomass, solar energy, geothermal energy, wind energy, ocean energy, hydroelectric power, or hydrogen produced from any of these resources.
- t) **“Shared Renewable Energy Facility”** means Renewable Energy Generation that is located in or near the service territory of an Electricity Provider where the electricity generated by the facility is credited to the Participants of the facility. A Shared Renewable Energy Facility may be located either as a stand-alone facility, called herein a stand-alone Shared Renewable Energy Facility, or behind the meter of a participating Participant, called herein a hosted Shared Renewable Energy Facility. A Shared Renewable Energy Facility must have at least two Participants.
- u) **“Subscription”** means an interest in a Shared Renewable Energy Facility. Each Subscription shall be sized to represent at least one panel in the Shared Renewable Energy Facility’s generating capacity; provided, however, that the Subscription is sized to produce no more than 120% of the Participant’s average annual electrical consumption. For Participants in

meter aggregation, 120% of the Participant's aggregate electrical consumption may be based on the individual meters or accounts that the Participant wishes to aggregate pursuant to these rules. In sizing the Subscription, a deduction shall be made for the amount of any existing renewable energy generation at the Participant's premises or any Subscriptions owned by the Participant in other Shared Renewable Energy Facilities.

II. GENERAL PROVISIONS

- a) LMI Subscriptions in an LMI Facility may be transferred or assigned to an LMI Participant Organization or to any person or entity that qualifies to be an LMI Customer under these rules. Subscriptions in an LMI Facility may be transferred or assigned to an LMI Participant Organization or to any person or entity that qualifies to be an LMI Facility Participant under these rules.
- b) New LMI Facility Participants may be added at the beginning of each billing cycle. The owner of an LMI Facility or its designated agent shall inform the Electricity Provider of any changes to the following information concerning the LMI Facility Participants in the Shared Renewable Energy Facility on a monthly basis: (1) a list of individual LMI Facility Participants by name, address, account number or meter number; (2) the proportional interest of each LMI Facility Participant in the LMI Facility; and (3) for LMI Facility Participants who participate in meter aggregation, the rank order for the additional meters or accounts to which Bill Credits are to be applied.
- c) An LMI Facility Participant may change the individual meters or accounts to which the LMI Facility's electricity generation shall be attributed for that LMI Facility Participant no more than once quarterly, so long as the individual meters or accounts are eligible to participate.
- d) An Electricity Provider may require that LMI Facility Participants have their meters read on the same billing cycle.
- e) If the full electrical output of a stand-alone LMI Facility or the excess generation from a hosted LMI Facility is not fully allocated to LMI Facility Participants, the Electricity Provider shall purchase the unsubscribed energy at a kWh rate that reflects the full value of the generation. Such rate shall include the avoided cost of the energy, including any Locational Benefits of the LMI Facility.
- f) If an LMI Facility Participant ceases to be a customer within the distribution service territory within which the LMI Facility is located, the LMI Facility Participant must transfer or assign their LMI Subscription either:
 - i. To their LMI Participant Organization; or
 - ii. To any person or entity that qualifies to be an LMI Facility Participant under these rules, in a manner prescribed by the Participation Organization, so long as such a transfer/assignment does not result in less than 60% of the Shared Renewable Energy Facility's Bill Credits being credited to the utility bills of LMI Customers, as required by Rule I(d).

- g) If the LMI Facility Participant ceases to be a customer of the Electricity Provider or switches Electricity Providers, the Electricity Provider is not required to provide compensation to the LMI Facility Participant for any unused Bill Credits.
- h) An LMI Facility shall be deemed to be located on the premises of each LMI Facility Participant for the purpose of determining eligibility for state and local incentives.
- i) Neither the owners of a Shared Renewable Energy Facility nor the LMI Facility Participants shall be considered public utilities subject to regulation by the [responsible agency having regulatory oversight] solely as a result of their interest in the LMI Facility.
- j) Prices paid for LMI and non-LMI Subscriptions in an LMI Facility shall not be subject to regulation by the [responsible agency having regulatory oversight].
- k) An LMI Facility Participant owns the RECs associated with the electricity allocated to the LMI Facility Participant's Subscription, unless the LMI Facility Participant explicitly contracts to sell, transfer, or retire such RECs through a separate transaction independent of any of any Shared Renewable Energy or interconnection tariff or contract. For an LMI Facility located behind the meter of a participating LMI Facility Participant, the host LMI Facility Participant owns the RECs associated with the electricity consumed on-site, unless the host LMI Facility Participant explicitly contracts to sell, transfer, or retire of such RECs through a separate transaction independent of any Shared Renewable Energy or interconnection tariff or contract.
- l) The dispute resolution procedures available to parties in the Electricity Provider's interconnection tariff shall be available for the purposes of resolving disputes between an Electricity Provider and an LMI Facility Participant, or their designated representatives, for disputes involving the Electricity Provider's allocation of Bill Credits to the LMI Facility Participant's electricity bill consistent with the allocations provided pursuant to Rule II(b). The Electricity Provider shall not be responsible for resolving disputes related to the agreements between an LMI Facility Participant, the owner of an LMI Facility, and/or an LMI Participant Organization or any other party. This provision shall in no way limit any other rights the LMI Facility Participant may have related to an Electricity Provider's provision of electric service or other matters as provided by, but not limited to, tariff, decision of [responsible regulatory body or agency], or statute.
- m) LMI Customers must demonstrate eligibility for LMI Subscriptions prior to participating in this program. Once eligibility is established, either through qualification for another LMI program as specified by the Program Implementing Agency and/or in compliance with criteria established by the Program Implementing Agency, LMI Customers shall not be required to prove eligibility on an ongoing basis; provided, however, that each time an LMI Customer renews or signs a new contract with a Subscriber Organization, the LMI Customer must demonstrate eligibility for an LMI Subscription.

III. BILL CREDIT

- a) An Electricity Provider shall not limit the cumulative, aggregate generating capacity of LMI Facilities. The aggregate generating capacity of an LMI Facility shall not count against the State's aggregate net metering cap, if applicable.
- b) For an LMI Facility, the total amount of electricity expressed in kWh available for allocation to LMI Facility Participants, and the total amount of RECs generated by the LMI Facility and allocated to LMI Facility Participants, shall be determined by a production meter paid for by the LMI Subscriber Organization. It shall be the Electricity Provider's responsibility to read the production meter.
- c) For a hosted LMI Facility, the determination of the quantity of Bill Credits available to LMI Facility Participants of that LMI Facility, including the host LMI Facility Participant, shall be based on any energy production of the LMI Facility that exceeds the host LMI Facility Participant's instantaneous on-site consumption during the applicable billing period and the LMI Facility Participant's Subscription in that LMI Facility.
- d) For a stand-alone LMI Facility, the determination of the quantity of Bill Credits available to each LMI Facility Participant shall be based on the total exported generation of the LMI Facility and each LMI Facility Participant's Subscription.
- e) The Electricity Provider shall carry over any excess Bill Credits earned by an LMI Facility Participant and not used in the current billing period to offset the LMI Facility Participant's consumption in subsequent billing periods until all credits are used or electric service is terminated. Any excess Bill Credits shall not reduce any fixed monthly customer charges imposed by the Electricity Provider.
- f) The value of the Bill Credits shall be determined by one of the two approaches described in Sections IV and V of IREC's *Model Rules for Shared Renewable Energy Programs*.⁶⁶

IV. ADDITIONAL FINANCIAL CONSIDERATIONS⁶⁷

- a) The Program Implementing Agency shall offer, allow for and/or coordinate with other agencies or entities to provide for, at least one of the following:
 - i. Backup guarantees from non-LMI Participants, in the event of participating LMI Customer default;
 - ii. Direct incentives to participating LMI Customers and/or LMI Facilities, including, but not limited to: rebates or other cash offers; Bill Credit adders; LMI Subscription cost waivers or reductions; REC or solar REC adders or multipliers;
 - iii. Tax incentives for LMI Facilities;
 - iv. Loan programs or credit enhancements for participating LMI Customers and/or LMI Facilities, including, but not limited to: loan loss reserve mechanisms; on-bill

⁶⁶ The *Model Rules* describe an embedded cost-based approach, based on participants' retail rates, and a value-based approach to bill credit valuation.

⁶⁷ With these Additional Financial Considerations, IREC is not recommending a particular financing tool or mechanism for all LMI shared renewables programs, but rather that programs should consider these options and provide for at least one within the program structure.

financing; Property-Assessed Clean Energy (PACE) programs; and revolving loan funds.

- v. Other credit assistance for participating LMI Customers, including the use of expanded, alternative, and/or hybrid underwriting criteria.
 - vi. Low-cost public financing opportunities, including, but not limited to, municipal or other governmental bonds and “green bonds.”
- b) Offers of incentives and other financing mechanisms may be differentiated by classes of LMI Customers, including differentiating the incentives and other financing mechanisms offered to Low-Income Customers and Moderate-Income Customers.
- c) Offers of incentives and other financing mechanisms may be differentiated by classes of LMI Facilities, including differentiating the incentives and other financing mechanisms depending on the percentage of LMI Customers participating in an LMI Facility.
- d) If additional funding is required to offer one of the options described above, such as, but not limited to, direct incentives, the Program Implementing Agency shall consider existing funding sources in addition to new funding sources, including, but not limited to, ratepayer assistance funds⁶⁸; and renewable energy or other energy-related funds targeted at LMI Customers.

V. MARKETING, EDUCATION AND OUTREACH

- a) If not a Partner Organization itself, an LMI Participant Organization shall contract with at least one Partner Organization to administer marketing, education and outreach for LMI Customers, including marketing, education and outreach regarding the incentives and financing opportunities available to LMI Customers. Wherever possible, existing materials and/or outlets targeting LMI Customers for other existing programs should be leveraged to minimize overall program costs.
- b) Marketing, education and outreach materials for LMI Subscriptions shall be culturally and linguistically appropriate, and shall include, but not be limited to: multi-lingual content; multi-media outreach, including web-based, phone-based, and mail-based outreach; and outreach to non-traditional outlets.
- c) As part of these marketing, education and outreach efforts, LMI Customers shall be informed of any Energy Conservation Improvement or other programs and/or incentives for which they may be eligible, including, but not limited to, energy efficiency programs and home energy audits. To the extent possible, the marketing of multiple LMI programs shall be coordinated and clearly explain each program and, if applicable, how the programs work together, in order to avoid excessive marketing and customer confusion.
- d) The Program Implementing Agency shall establish appropriate consumer protection requirements for LMI Customers participating in LMI Facilities,⁶⁹ which shall balance the

⁶⁸ For an example of this option in practice, see IREC’s CleanCARE proposal, attached to these *LMI Guidelines*.

⁶⁹ Although consumer protection requirements are not addressed in the current version of IREC’s *Model Rules*, they are included here in recognition of the heightened sensitivity of the LMI customer group, especially with respect to impacts on income. IREC’s inclusion of consumer protection requirements for LMI Customers is not intended to imply that such requirements are not appropriate for all customers.

protection of LMI Customers with maintaining program cost-effectiveness, and which shall comport with the criteria for marketing, education and outreach materials described in this Section V. These consumer protection requirements shall include LMI Customer data privacy protections. These consumer protection requirements shall also include a requirement that the LMI Participant Organization or its agent clearly and concisely disclose the material terms of the LMI Subscription to the LMI Customer. These may include those below.

- i. LMI Subscription price.
- ii. Statement that the LMI Participant Organization, LMI Facility, and LMI Subscription arrangement comport with all applicable laws, including all applicable tax and security laws.
- iii. Future costs and benefits of the subscription, including: all nonrecurring (i.e. one-time) charges; all recurring charges; terms and conditions of service, including the term of the contract, and terms and conditions for early termination; whether any charges may increase during the course of service and, if so, how much advance notice is provided to the LMI Customer; any penalties that the LMI Participant Organization may charge to an LMI Customer; the process for unsubscribing and any associated costs; an explanation of the LMI Customer data that the LMI Participant Organization will share with the Electricity Provider and that Electricity Provider will share with the Participant Organization; the Electricity Provider's data-privacy policy and Participant Organization's data-privacy policy; the method of providing notice to LMI Customers when the LMI Facility is out of service; assurance that all installations, upgrades, and repairs will be under the direct supervision of an appropriately certified professional and that maintenance will be performed according to industry standards, including the recommendations of the manufacturers and other operational components; the allocation of unsubscribed production; and a statement that the LMI Participant Organization is solely responsible for resolving any disputes with the Electricity Provider or LMI Customers about the accuracy of the LMI Facility production and that Electricity Provider is solely responsible for resolving any disputes with the LMI Customer about the applicable rate used to determine the amount of the Bill Credit.
- iv. An explanation of REC ownership in layman's terms and implications for the LMI Customer.
- v. Copy of the LMI Facility's contract with the Electricity Provider;
- vi. Proof of insurance.
- vii. Proof of a long-term maintenance plan.
- viii. LMI Facility production projections and a description of the methodology used to develop production projections.
- ix. LMI Participant Organization contact information for questions and complaints.

VI. PROGRAM ASSESSMENT

- a) The Program Implementing Agency shall annually collect and publicly report data relevant to the LMI shared renewables program's goals, including, but not limited to:
- i. Number of LMI Customers participating in the program;
 - ii. Number of LMI Facilities participating in the program;
 - iii. Percentage of LMI Customers served by each LMI Facility;
 - iv. Size of each LMI Facility;
 - v. Location of each LMI Facility; and,
 - vi. Percentage of LMI Subscription payment default.

APPENDIX

IREC's CleanCARE Proposal

The California Alternate Rates for Energy (CARE) program provides discounted electricity and gas rates for nearly 5 million qualified low-income enrollees. Because the CARE program is structured as a direct rate discount, however, it provides very limited opportunities for enrollees to participate in California's renewable energy programs.

With an eye to tackling barriers to increase customer participation in renewable energy in disadvantaged communities, IREC developed the CleanCARE pilot program proposal as a means to allow participants in the program to redirect their share of CARE funds towards the purchase of renewable generation from a third-party owned renewable energy facility located in a disadvantaged community and receive the resulting net energy metering (NEM) bill credits on their electricity bills. Via these bill credits, CleanCARE participants would continue to receive discounted electricity bills as low as, if not lower than, their bills using the rate discount they would have received in the traditional CARE program.

IREC has submitted the CleanCARE pilot program proposal to the California Public Utilities Commission (CPUC) for its consideration in three regulatory proceedings to date: A.14-11-007 et al. (ratepayer assistance docket), R.14-07-002 (net metering docket), and R.12-06-013 (residential rate reform docket). The proposal remains under consideration in the first two proceedings. This proposal has been refined over time to reflect input and feedback received through consultation with numerous parties.

While the proposal is specific to California, the proposal concepts may be applicable in other states with ratepayer discount programs in place.

How would CleanCARE work?

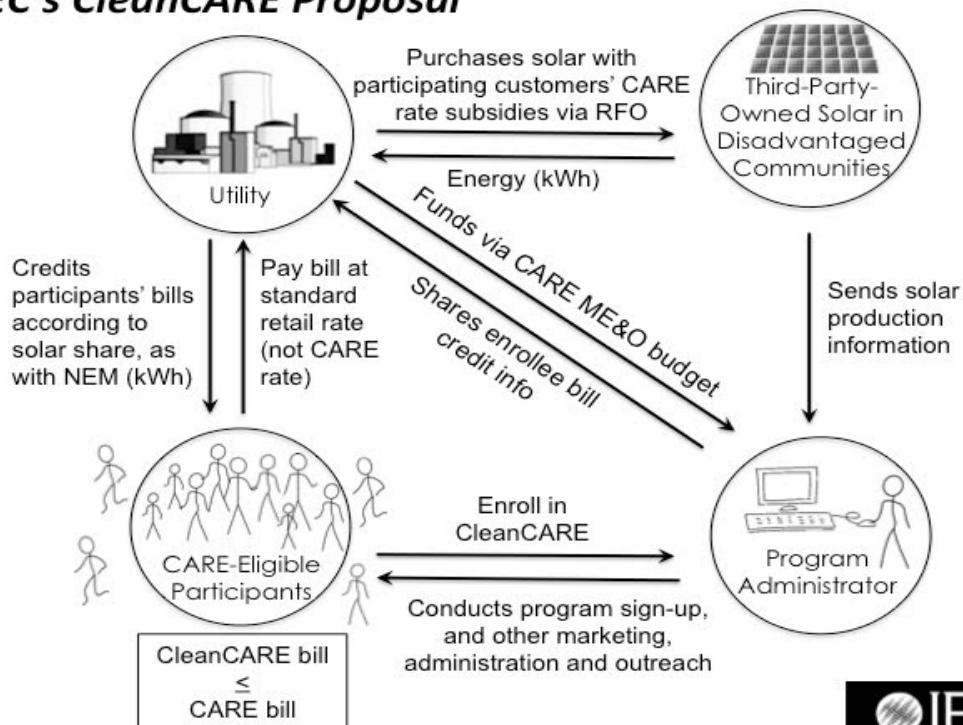
CleanCARE would allow a portion of the funds allocated toward CARE rate reductions to be invested in the development of shared distributed renewable generation by a third-party entity and procured by the utility via a competitive solicitation. CARE customers electing the CleanCARE option would move to the standard rate for the rate class and through participation in the CleanCARE program would offset a portion of their monthly bills through NEM kilowatt-hour (kWh) bill credits. As a result, a CleanCARE customer would receive the equivalent or a lower bill than the customer would have seen under the traditional CARE program rates. In this way, the CleanCARE option would increase opportunities for low- and moderate-income households to participate in renewable energy programs while guaranteeing at least the average rate levels and benefits of the current CARE program and being revenue-neutral for ratepayers. IREC proposes a third-party-administered program, initially relying on five MW of pilot project capacity and, if

successful, expanding to serve more customers with more renewable energy. CleanCARE could also eventually be expanded to incorporate energy efficiency, energy storage and demand response to decrease participants' bills via usage reductions as well as NEM bill credits.

The CleanCARE program can effectively serve to increase access to renewable energy for customers in “disadvantaged communities” and result in new renewable energy facilities sited in those communities. IREC intends this proposal to be a starting point for discussion on the manner in which a CleanCARE program option could meet these goals. IREC has already solicited and incorporated feedback from a variety of stakeholders and organizations, and looks forward to continuing to discuss this program concept.

Overview of CleanCARE Concept

IREC's CleanCARE Proposal



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Relationship to existing CARE program: Fundamentally, CleanCARE relies on the funding associated with the CARE rate discount to support investment in renewable energy generation for the benefit of participants via NEM bill credits. Participants in CleanCARE would have to meet the eligibility requirements for CARE but would choose CleanCARE's alternative bill reduction option instead of receiving the CARE rate discount, which would guarantee them the same or better bill reductions as they would receive under CARE rates. Thus participants in CleanCARE could still be considered part of the CARE program, and CleanCARE would support rather than undermine efforts to reach eligible CARE customers and achieve CARE penetration goals. In addition,

CleanCARE would rely on the CARE administrative budget, in particular with respect to marketing, education and outreach, and leverage existing efforts to minimize costs.

Disadvantaged communities: Consistent with California Public Utilities Commission practice, IREC proposes using the most recent version of the California Communities Environmental Health Screening Tool (CalEnviroScreen) to identify the top 25 percent of census tracts that represent the most disadvantaged communities, which should represent a significant percentage of the State geographically, including a fair representation of rural communities. Therefore, there should be many potential sites for solar development within disadvantaged communities. Based on an initial exploration of census data and the top 25 percent of communities identified by CalEnviroScreen, IREC expects that there is significant overlap between CARE enrollment and customers living in “disadvantaged communities,” but recognizes that (1) some CARE customers do not live in these communities and (2) some customers in these communities are not eligible for the CARE program. Nonetheless, IREC believes that CleanCARE would reach a significant customer segment in “disadvantaged communities.” In addition, CleanCARE would incorporate a requirement that all of the renewable energy facilities associated with the program be located within “disadvantaged communities,” as discussed below.

IREC further notes that, based on the data we have gathered to date, many CARE-eligible customers are renters who cannot install on-site renewable generation. CleanCARE would provide an option for these customers to participate in renewable energy. CleanCARE would be offered to both CARE-eligible renters and homeowners, and some homeowners may find it to be a more attractive option. CleanCARE would complement California’s successful Single-family Affordable Solar Housing (SASH) and Multifamily Affordable Solar Housing (MASH) programs, and the forthcoming Multifamily Affordable Housing Solar Roofs Program established by Assembly Bill (AB) 693 (Eggman 2015), by increasing program options for low-income customers. CARE-eligible customers living in single-family homes may be able to choose between the SASH program and CleanCARE, for example. In some regions, up to 40 percent of eligible SASH clients have properties that are not suitable for solar, for example due to shading issues or roofs in need of replacement. Likewise, CARE enrollees in multifamily housing may be able to choose between MASH or the new Solar Roofs Program and CleanCARE. Together with SASH, MASH, and the AB 693 Solar Roofs Program, CleanCARE would expand the options for low-income customers to benefit from renewable energy generation. A customer’s choice would depend on program eligibility requirements, and the customer’s particular situation, needs and preferences, including whether the customer is more interested in on-site or shared renewable generation.

Optional program, starting on a pilot basis: IREC proposes that CleanCARE be introduced on a pilot basis, with voluntary, limited enrollment in particular regions of the state, for example those with high levels of participation in the current CARE program or large numbers of enrollees who have higher energy usage. As discussed below, CleanCARE is likely to be most attractive to Tier 3 CARE customers and potentially Tier 2 CARE customers, as well, especially in future years. Specifically, CleanCARE could be piloted for high-usage CARE customers, with a focus on

customers that have already implemented energy-efficiency improvements through the Energy Savings Assistance Program (ESAP) and are still high energy users; these customers would likely stand to benefit the most from CleanCARE. Alternatively, CleanCARE could begin with enrollment in a region with the highest proportion of CARE customers in “disadvantaged communities.” This framework would allow for identification of sites for the “in-community” renewables and focus outreach efforts on a particular region. Other means of creating a sample customer base for a pilot program could also be developed with input from interested parties. Marketing and outreach for the program would be closely coordinated with entities with experience in this area, including existing low-income program administrators, state weatherization program experts, and other community-based organizations to identify the most effective strategies and ensure positive uptake.

IREC proposes that the pilot program capacity be limited to 5 MW total—with approximately 2 MW of smaller-sized projects (20 or more projects, sized smaller than 100 kW) and approximately 3 MW of larger projects (sized from 101 kW to 1 MW). If the first year pilot (e.g., 2016) is successful, then the program would be expanded to incorporate more renewable energy to serve more customers, for example an additional 20 MW in 2017 and 25 MW in 2018. In addition, energy efficiency, energy storage and demand response could also be incorporated, as discussed below.

Program administration: IREC suggests that a third party administer the CleanCARE program to help to ensure that the program is as nimble and cost-effective as possible. A third party with direct experience working with “disadvantaged communities” would be especially appropriate in this case. The utilities would necessarily play an important role in CleanCARE implementation and administration, as well. A framework for appropriate information-sharing between the third party and the utility would need to be put in place since the utilities have information on CARE enrollees’ locations and energy usage, and so that the utilities could apply appropriate bill credits to enrollees’ bills. In addition, IREC expects that CleanCARE marketing, outreach and education would be coordinated with current outreach efforts around CARE and ESAP, as well as the SASH and MASH programs, and that these existing efforts would be leveraged to keep costs low. Marketing, outreach and education efforts should also be coordinated with community-based organizations. Such marketing, education and outreach efforts should include education for participants in reading and understanding their electricity bills. In addition, a workforce development component could be incorporated into the program to maximize the benefit to disadvantaged communities.

Participation: The program administrator would sign up interested customers only after evaluating whether, by participating in CleanCARE, customers would save the same or more money as they would have under the traditional CARE program, based on their past 12 months of energy consumption. To do this, the program administrator would conduct an analysis similar to that described below regarding the program’s bill impact. If the program administrator were to determine that the customer would not benefit from CleanCARE (i.e., not achieve the same or better bill discount as under standard CARE), then the customer could be placed on a wait list and could have their eligibility re-evaluated the following year. Guaranteeing the participant’s bill savings going forward is discussed further below. In addition, as under the traditional CARE program, if a

customer were to re-locate within a utility's service territory, she would be able to continue her participation in CleanCARE.

Standard retail rates: In contrast to CARE participants, CleanCARE enrollees would remain on or be transferred to their utility's standard residential rate structure instead of receiving discounted rates. The requisite CARE "bill reduction" would be achieved by reduced overall energy *bills* through kWh bill credits, rather than reduction in energy *rates*. This shift would be an important improvement over the current CARE program because it would provide CleanCARE participants with greater information concerning the cost of their energy consumption, thereby increasing their ability to manage their energy costs directly based on consistent pricing signals over the longer term—both during enrollment in the CleanCARE program and after they have exited the program. In particular, the CleanCARE program would encourage participating customers to conserve energy, for example through energy efficiency implementation, since their remaining consumption not offset by bill credits would be at the higher standard rate than the reduced CARE rate. This is particularly important because many current CARE enrollees are only temporarily within the program but energy cost management decisions can continue to provide benefits after departing the program.

Shared distributed generation: The renewable distributed generation provided under CleanCARE would be from eligible renewable energy resources procured by the utilities through a competitive bid process and take the form of shared renewable generation of at least two types:

Some percentage of facilities (e.g., 30 percent) would be smaller-scale generation (e.g., 1 – 100 kW) located within "disadvantaged communities," and would include rooftop or small ground-mounted solar and potentially small-scale wind.

The remaining capacity would be larger-scale renewable distributed generation (e.g., 101 kW – 5 MW) located in optimal locations on the electricity grid, as determined by the local distribution utility. These larger facilities, like the smaller facilities, would be located within "disadvantaged communities."

Residents and other stakeholders from within the "disadvantaged communities" should be able to provide input regarding any facilities located in those communities. This would involve outreach to citizens, community groups, and/or local governments, and would occur through various forums, including local meetings, Commission-sponsored forums, and/or through utility or developer-led outreach, potentially in response to particular requirements in the procurement process as discussed below.

Utilizing shared renewable generation would allow for economies of scale on a programmatic basis by facilitating the installation of systems larger than those seen in on-site programs. At the same time, the "shared" aspect of these facilities can accommodate the participation of customers in the CARE program for a relatively short period of time, very likely shorter than a typical 20- or 25-year renewable energy contract. When a customer is no longer CARE-eligible and leaves the program, a

new customer could participate drawn from a wait list maintained by the program administrator. Beginning with a small program and phasing in capacity would limit any negative effects on ratepayers of unexpectedly low enrollment or project failure. If a project were to fail for any reason, and therefore not generate energy and associated kWh bill credits, CleanCARE participants could be immediately transferred back to traditional CARE rates such that they would not experience any adverse bill impacts.

Moreover, to further address cost concerns, CleanCARE could be designed to unlock broader grid benefits by targeting areas of the grid identified by the local distribution utility as benefiting from renewable distributed generation and possibly energy storage. These benefits would flow to the local utilities' ratepayers as a whole. In addition, relying on a fleet of CleanCARE facilities to serve all CleanCARE enrollees should help minimize risk as compared to a customer or group of customers relying on a single facility.

Bill credit mechanism: To realize the necessary bill reductions, CleanCARE enrollees would receive NEM kWh bill credits associated with the shared renewable generation developed under the program. The program would ensure that their electricity bills would be offset via these NEM credits at the same level or more than they currently experience under the broader CARE program. Participating customers' CARE subsidies would be used to procure renewable energy, as discussed below; the CleanCARE customer would receive a set quantity of energy from the CleanCARE renewable energy facility, via NEM bill credits, based on how much the CARE subsidy associated with customer's full bill will purchase.

CleanCARE presumes that customers would receive a full retail rate bill credit (i.e., one-to-one kWh offset), and IREC suggests that full retail rate bill credits are appropriate for customers participating in CleanCARE. In order to address concerns raised in the past by utilities and other parties about the costs of "wheeling" power to off-site customers, IREC suggests a cost adder to the all-in cost of CleanCARE solar generation to reflect distribution costs. This value stream would flow to utilities, as discussed below.

Although the Commission has approved a separate bill credit paradigm for the Green Tariff Shared Renewables (GTSR) program for off-site shared generation, it results in participants paying a premium above their normal rates to participate and therefore is not appropriate in for CleanCARE, where participants must save as much as, if not more than, they would have under the CARE rate discount. IREC notes that stakeholders will be exploring ways to enable participation by customers in disadvantaged communities in the GTSR program, as well. It is uncertain at this time what that will look like and/or when that will be made available for disadvantaged communities, however, as no proposals have been put forward or discussed to date.

Improved bill reduction: IREC has calculated the bill impacts of CleanCARE under certain illustrative assumptions for customers consuming 400 kWh per month and 660 kWh per month in both 2015 and 2018 in each of the three utilities' service territories. We relied on the residential and

CARE rates for 2015 and 2018 provided by utilities in the residential rates Rulemaking (R.) 12-06-013, which incorporate the Commission’s final decision in that docket. As for the cost of solar, IREC evaluated two scenarios, both of which assumed a \$0.03 per kWh drop in solar prices between 2015 and 2018. (1) The first scenario assumes solar costs based on the utilities’ Renewable Market Adjusting Tariff (ReMAT) prices for as-available peaking resources, which currently range from \$0.065 to \$0.089 per kWh. (2) The second scenario assumes somewhat higher solar costs--\$0.15 in 2015 and \$0.12 in 2018—intended to account for potential additional costs associated with the CleanCARE program, including the requirement to locate facilities in disadvantaged communities. Ultimately, the cost of solar in the CleanCARE program would be the most competitive price received in the competitive solicitation discussed below.

For the all-in cost of CleanCARE solar generation, IREC also incorporated per-kWh adders associated with administrative costs and distribution costs, whose total value would flow to the utilities and program administrator as appropriate. IREC relied on each utility’s current distribution rate component for the distribution cost for 2015, which ranged from \$0.057 to 0.09 per kWh, and assumed an adder equivalent to the same percentage of the total retail rate in 2018 (\$0.047 to \$0.073 per kWh). In all cases, we assumed a \$0.03 per kWh adder for administrative costs.

IREC emphasizes that we evaluated all of these scenarios for illustrative purposes.

The outcomes varied across utilities and scenarios. As an example, IREC provides the analysis for an SCE customer consuming 660 kWh per month, using a solar cost based on SCE’s ReMAT rate, in both 2015 and 2018, as identified in the final order on residential rates R.12-06-013. As the tables show, such an SCE CleanCARE customer would save \$20.68 more per month in 2015 as compared to the customer’s bill on discounted CARE rates. In 2018, the customer would save even more—an additional \$46.21 per month. This customer would also be able to participate directly in renewable energy a way previously not available to them.

SCE Customer Bill Savings Under CleanCARE (2015)

	2015 CARE				2015 CleanCARE				Add'l Bill Savings
	Usage (kWh)	CARE Rate (\$/kWh)	Bill (\$)	CARE Subsidy (\$)	Ren. Energy (kWh)	Net Usage (kWh)	Res. Rate (\$/kWh)	Total Bill (\$)	
Tier 1	330	0.103	33.99	15.18		330	0.149	49.17	
Tier 2	99	0.145	14.36	6.24		83	0.208	17.30	
Tier 3	231	0.168	38.81	17.09		0	0.242	0	
TOTAL	660		87.15	38.51	247	413		66.47	20.68

SCE Customer Bill Savings Under CleanCARE (2018)

	2015 CARE				2015 CleanCARE				Add'l Bill Savings
	Usage (kWh)	CARE Rate (\$/kWh)	Bill (\$)	CARE Subsidy (\$)	Ren. Energy (kWh)	Net Usage (kWh)	Res. Rate (\$/kWh)	Total Bill (\$)	
Tier 1	330	0.112	36.96	18.15		275	0.167	45.86	
Tier 2	330	0.167	55.11	26.40		0	0.247	0	
TOTAL	660		92.07	44.55	385	275		45.86	46.21

IREC emphasizes that the bill savings associated with CleanCARE are just a piece of the benefits associated with the proposed program, which also include the benefits associated with increased renewable energy generation generally and benefits of siting those facilities in “disadvantaged communities.” In addition, the bill savings could be improved by incorporating energy efficiency improvements into the program to further lower a customer’s bill. As discussed below, this may be more feasible as solar costs drop and a portion of the CARE funding could be transferred to energy efficiency and other demand-side management. Finally, a workforce development component to the CleanCARE program could further enhance job-related and other economic benefits to disadvantaged communities.

Guaranteed bill reduction: Guaranteeing that participants receive the same or better bill discount as under the standard CARE program is fundamental to CleanCARE. Once a customer is enrolled, IREC expects that the program administrator, in consultation with the Commission, utilities and other stakeholders, would determine the best way to guarantee the requisite bill discount on a month-to-month basis for the customer. In addition, the pilot phase could help inform the refinement of this mechanism going forward, once it is deployed in practice. In the meantime, IREC continues to solicit feedback from program administrators and utilities, both of whom have practical experience running programs, as well as other entities regarding the appropriate mechanism. In this proposal we offer, two possible mechanisms for consideration.

Option 1: Once a customer is enrolled, she would be placed in the CleanCARE queue, with her position determined by the date of her enrollment. Each month, the program administrator would evaluate the CleanCARE participant queue customer by customer. If the program administrator determines that Customer 1 would save money on CleanCARE that month based on how much energy that customer actually used in that month, then Customer 1 would participate in CleanCARE, i.e., pay for service at standard residential rates and receive the appropriate number of kWh bill credits. If not, that customer would receive service at CARE rates. The program administrator would then conduct the same evaluation for Customer 2 and so on, until all of the kWh produced by the CleanCARE project(s) that month had been allocated.

Option 2: Once a customer is enrolled, she would participate in CleanCARE for that program year unless she leaves her utility’s service territory, in which case, her share would be transferred to other customers on the wait list. There would be no penalty for leaving the program. On a monthly basis,

the program administrator would evaluate the CleanCARE customer's bill impacts under traditional CARE rates and the CleanCARE paradigm. If necessary to meet the requisite CARE bill reduction in a given month, and to account for seasonal variations of solar output over the course of the year, the program administrator would apply additional kWh bill credits to that customer's bill for the month in order to bring her bill down to the level it would have been under the CARE program. The program administrator would set-aside a modest "bank" of kWh bill credits (e.g., five percent of the total CleanCARE generation) for this purpose, to be included as an administrative expense of the program (i.e., covered by the \$0.03 per kWh assumed administrative cost). At the end of the program year, the CleanCARE program administrator would re-evaluate each customer's eligibility for CleanCARE. If the administrator determines that a customer did not achieve the CleanCARE bill savings on average across the year, she will be returned to CARE rates and notified accordingly. In addition, at the end of the year, any excess credits in the kWh credit "bank" would be credited to all the utilities' ratepayers.

Regardless of the mechanism used, guaranteeing the bill discount should be a program priority and the process should also be as easy to understand as possible for participating customers.

Procurement: The utilities would use a request for offer (RFO) process to procure renewable generation facilities for the CleanCARE program, beginning with the initial pilot phase of 5 MW. The RFO would require that facilities be located within "disadvantaged communities." Similarly bidders could be required to conduct some form of outreach with those disadvantaged communities prior to submitting a bid. The Renewable Energy Credits (RECs) associated with these facilities would be retired on behalf of participating customers.

It will be critical to ensure long-term funding for the CleanCARE renewable energy facilities such that the income stream derived from shifting the CARE rate subsidy would be locked in for a significant number of years (e.g., 10-20 years). Long-term funding of the CleanCARE program is essential because CleanCARE enrollees would not be "buying down" the upfront cost of their participation, as participants might in other renewable energy programs. Financiers will need to have the assurance of a long-term income stream.

Future "clean energy package"—energy storage, energy efficiency, demand-side management:

After the initial pilot phase of the program, IREC proposes that CleanCARE would incorporate investment in a broader "clean energy package," which would likewise be designed to achieve an equivalent or better monthly bill for CleanCARE enrollees as compared to bills they would have received under the current CARE program. In order to achieve such bill savings for CleanCARE enrollees, the "clean energy package" would incorporate energy efficiency upgrades to lower the enrollee's overall energy consumption, in addition to the bill credits associated with participation in shared renewable energy generation.

The concept of the "clean energy package" is intentionally left flexible enough to allow for development and offering of diverse packages of targeted measures that meet the needs of

CleanCARE enrollees. This flexibility should allow for packages to include an appropriate mix of energy efficiency and renewable distributed generation to achieve cost-effective bill savings for enrollees while also using energy storage and demand response to drive grid benefits. The program administrator and/or “clean energy package” offerors would be required to identify target communities, assess their energy needs, and develop a plan to meet those needs within the program parameters. Our discussions with organizations working in low-income communities on energy issues show broad support for this idea of a stable, long-term funding mechanism designed to support investment in a holistic package of services for enrollees to meet their energy needs.

The ESAP could fund energy efficiency offerings and participation in ESAP could be coordinated with the CleanCARE program enrollment process to ensure CleanCARE enrollees receive energy efficiency upgrades to reduce their consumption prior to enrollment in CleanCARE. Similarly, coordination between CleanCARE and demand response programs targeted at residential customers, such as San Diego Gas & Electric Company’s Summer Saver program, could be increased to drive overall program savings and grid benefits.

Because a “clean energy package” would introduce additional complexity into the program, IREC proposes introducing it in a later phase of the program.

Benefits of CleanCARE

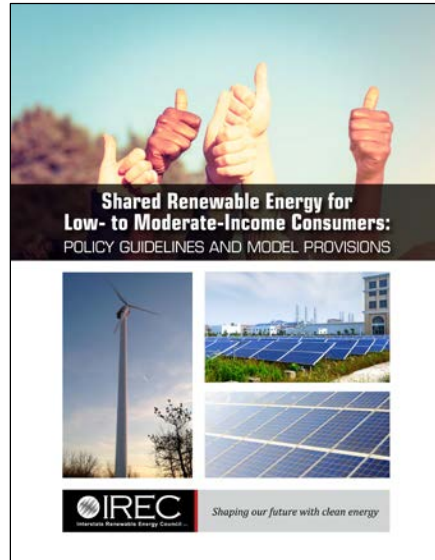
The cornerstone of the CleanCARE program is that it would achieve at least the same beneficial bill impacts for enrollees as the current CARE program, and could empower program participants to achieve even better results. In addition, low-income customers enrolled in CleanCARE would be able to enjoy the benefits of renewable energy generation. On-site renewable generation programs to date have typically had high cost barriers to participation and have been largely unavailable to renters. Because enrollees would be served under their utility’s standard retail rates, CleanCARE would also more directly and continuously provide the same price signals as other customers, instead of masking those signals with below-cost rates. In the longer term, this should provide these customers the information about rates that they need to continue to make long-term decisions about energy conservation and efficiency.

In addition, CleanCARE would benefit “disadvantaged communities” in at least two ways. First, it would provide for direct participation by CARE-eligible customers in “disadvantaged communities. These customers, as well as other participating CARE-eligible customers located in other communities, would see the bill savings from participation in the CleanCARE program on their electricity bills. Second, CleanCARE would result in renewable energy development within “disadvantaged communities,” which could include both urban and rural locations. Thus although there is not complete overlap between CARE-eligible customers and customers within “disadvantaged communities,” all customers within disadvantaged communities can benefit from increased renewable generation in their communities. These include the environmental benefits of

these facilities, as well as job creation and other workforce-related benefits, in particular if a job training component is incorporated into the program.

CleanCARE should also drive down rates for all California energy consumers as it represents a more efficient use of ratepayer funds for low-income assistance. Importantly, development of CleanCARE resources should allow California to leverage the 30% federal Investment Tax Credit, which the federal government recently extended. This would result in a 30% reduction in the price of the renewable distributed generation used to serve the program along with an additional 20% reduction in cost via accelerated depreciation. Additionally, by installing renewable distributed generation at locations on the grid identified by utilities as benefiting from such generation, CleanCARE would maximize grid benefits from the program, which in turn should help to drive down all energy customers' rates over time.

Beyond these benefits, the modifications to the CARE program embodied in CleanCARE are aligned with California's overall renewable energy goals. These include the Commission's loading order, the 33% Renewable Portfolio Standard and the Governor's 50% renewable energy and 12,000-MW distributed generation goals.



About **IREC**

The Interstate Renewable Energy Council, Inc. (IREC) is a non-profit organization accelerating the use of renewable energy since 1982. Today, IREC is a nationally recognized thought leader, stakeholder coordinator, independent expert resource and facilitator of regulatory reform. Our work expands consumer access to clean energy; generates information and objective analysis grounded in best practices and standards; and leads national efforts to build a quality-trained clean energy workforce, including a unique credentialing program for training programs and instructors. IREC is an accredited American National Standards Developer.

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Attachment B

Attachment B-1
CleanCARE Proposal

CleanCARE—Investing in Communities

Revised August 3, 2015

In developing the successor standard contract or tariff to the current net energy metering (NEM) tariff, Assembly Bill (AB) 327 requires the Commission to “[e]nsure that the standard contract or tariff made available to eligible customer-generators ensures that customer-sited renewable distributed generation continues to grow sustainable and include specific alternatives designed for growth among residential customers in disadvantaged communities.” Pub. Util. Code § 2827.1(b) (emphasis added). IREC proposes a new California Alternate Rates for Energy (CARE) rate option—CleanCARE—as one of those specific alternatives. Under CleanCARE, low-income and medical baseline customers would receive access to affordable renewable energy. The CleanCARE framework would also provide these customers with a clearer connection between cost-causation and energy usage. CleanCARE could complement other alternatives proposed by other parties.

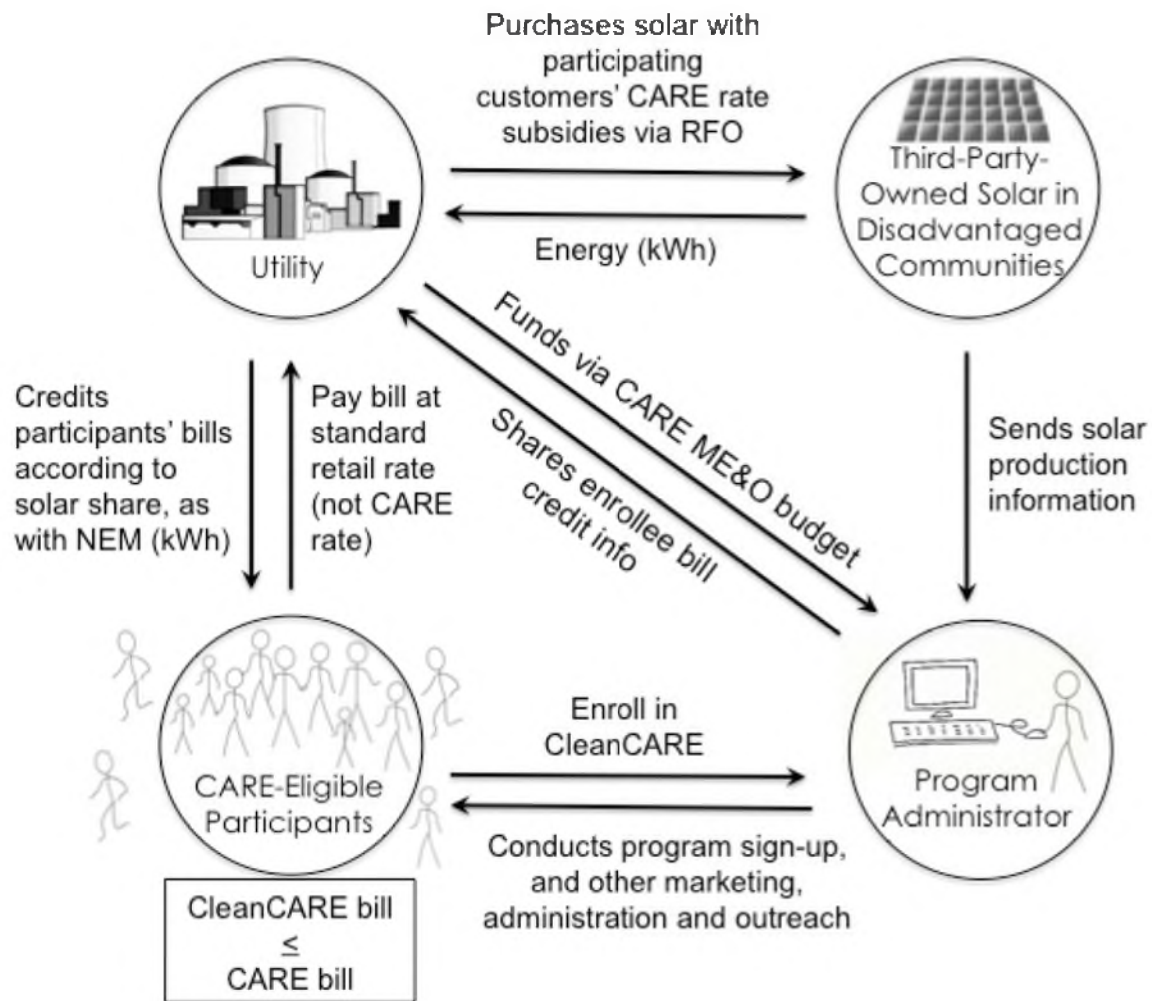
CleanCARE would allow a portion of the funds allocated toward CARE rate reductions to be invested in the development of shared distributed renewable generation by a third-party entity and procured by the utility via a competitive solicitation. CARE customers electing the CleanCARE option would move to the standard rate for the rate class and through participation in the CleanCARE program would offset a portion of their monthly bills through net energy metering (NEM) kilowatt-hour (kWh) bill credits. As a result, a CleanCARE customer would receive the equivalent or a lower bill than the customer would have seen under the traditional CARE program rates. In this way, the CleanCARE option would increase opportunities for low- and moderate-income households to participate in renewable energy programs while guaranteeing at least the average rate levels and benefits of the current CARE program and being revenue-neutral for ratepayers. IREC proposes a third-party-administered program, initially relying on five MW of pilot project capacity and, if successful, expanding to serve more customers with more renewable energy. CleanCARE could also eventually be expanded to incorporate energy efficiency, energy storage and demand response to decrease participants’ bills via usage reductions as well as NEM bill credits.

The CleanCARE program can effectively serve to increase access to renewable energy for customers in “disadvantaged communities” and result in new renewable energy facilities sited in those communities. IREC intends this proposal to be a starting point for discussion on the manner in which a CleanCARE program option could meet these goals. IREC has already solicited and incorporated feedback from a variety of stakeholders and organizations, and looks forward to continuing to discuss this program concept.

How would CleanCARE work?

Currently, the CARE program provides discounted electricity and gas rates for nearly 5 million low-income enrollees. Because the CARE program is structured as a direct rate discount, however, it provides very limited opportunities for enrollees to participate in California’s renewable energy programs. CleanCARE would provide an option to redirect a portion of the current CARE program funds associated with this rate discount toward purchasing renewable generation from a third-party developer for the benefit of CARE-eligible customers.

Overview of CleanCARE Concept



Relationship to existing CARE program: Fundamentally, CleanCARE relies on the funding associated with the CARE rate discount to support investment in renewable energy generation for the benefit of participants via NEM bill credits. Participants in CleanCARE would have to meet the eligibility requirements for CARE but would choose CleanCARE’s alternative bill reduction option instead of receiving the CARE rate discount, which would guarantee them the same or better bill reductions as they would receive under CARE rates. Thus participants in CleanCARE could still be considered part of the CARE program, and CleanCARE would support rather than undermine efforts to reach eligible CARE customers and achieve CARE penetration goals. In addition, CleanCARE would rely on the CARE administrative budget, in particular with respect to marketing, education and outreach, and leverage existing efforts to minimize costs.

Disadvantaged communities: AB 327 does not define the term “disadvantaged communities.” In this instance, IREC believes that it would be appropriate to use the most recent version of the California Communities Environmental Health Screening Tool (CalEnviroScreen) to identify the census tracts that represent the most disadvantaged communities. No matter the percentage cut-

off and methodology used (e.g., statewide versus regional analysis), the census tracts identified by CalEnviroScreen should represent a significant percentage of the State geographically, including a fair representation of rural communities. Therefore, there should be many potential sites for solar development within disadvantaged communities. Based on an initial exploration of census data and the top 25 percent of communities identified by CalEnviroScreen, IREC expects that there is significant overlap between CARE enrollment and customers living in “disadvantaged communities,” but recognizes that (1) some CARE customers do not live in these communities and (2) some customers in these communities are not eligible for the CARE program. Nonetheless, IREC believes that CleanCARE would reach a significant customer segment in “disadvantaged communities.” In addition, CleanCARE would incorporate a requirement that all of the renewable energy facilities associated with the program be located within “disadvantaged communities,” as discussed below.

IREC further notes that, based on the data we have gathered to date, many CARE-eligible customers are renters who cannot install on-site renewable generation. CleanCARE would provide an option for these customers to participate in renewable energy. CleanCARE would be offered to both CARE-eligible renters and homeowners, and some homeowners may find it to be a more attractive option. CleanCARE would complement California’s successful Single-family Affordable Solar Housing (SASH) and Multi-family Affordable Solar Housing (MASH) programs by increasing program options for low-income customers. CARE-eligible customers living in single-family homes may be able to choose between the SASH program and CleanCARE, for example. In some regions, up to 40 percent of eligible SASH clients have properties that are not suitable for solar, for example due to shading issues or roofs in need of replacement. Likewise, CARE enrollees in multifamily housing may be able to choose between MASH and CleanCARE. Together with SASH and MASH, CleanCARE would expand the options for low-income customers to benefit from renewable energy generation. A customer’s choice would depend on program eligibility requirements, and the customer’s particular situation, needs and preferences, including whether the customer is more interested in on-site or shared renewable generation.

Optional program, starting on a pilot basis: IREC proposes that CleanCARE be introduced on a pilot basis, with voluntary, limited enrollment in particular regions of the state, for example those with high levels of participation in the current CARE program or large numbers of enrollees who have higher energy usage. As discussed below, CleanCARE is likely to be most attractive to Tier 3 CARE customers and potentially Tier 2 CARE customers, as well, especially in future years. Specifically, CleanCARE could be piloted for high-usage CARE customers, with a focus on customers that have already implemented energy-efficiency improvements through the Energy Savings Assistance Program (ESAP) and are still high energy users; these customers would likely stand to benefit the most from CleanCARE. Alternatively, CleanCARE could begin with enrollment in a region with the highest proportion of CARE customers in “disadvantaged communities,” as the Commission defines them under AB 327. This framework would allow for identification of sites for the “in-community” renewables and focus outreach efforts on a particular region. Other means of creating a sample customer base for a pilot program could also be developed with input from interested parties. Marketing and outreach for the program would be closely coordinated with entities with experience in this area, including existing low-income

program administrators, state weatherization program experts, and other community-based organizations to identify the most effective strategies and ensure positive uptake.

IREC proposes that the pilot program capacity be limited to 5 MW total—with approximately 2 MW of smaller-sized projects (20 or more projects, sized smaller than 100 kW) and approximately 3 MW of larger projects (sized from 101 kW to 1 MW). If the first year pilot (e.g., 2016) is successful, then the program would be expanded to incorporate more renewable energy to serve more customers, for example an additional 20 MW in 2017 and 25 MW in 2018. In addition, energy efficiency, energy storage and demand response could also be incorporated, as discussed below.

Program administration: IREC suggests that a third party administer the CleanCARE program to help to ensure that the program is as nimble and cost-effective as possible. A third party with direct experience working with “disadvantaged communities” would be especially appropriate in this case. The utilities would necessarily play an important role in CleanCARE implementation and administration, as well. A framework for appropriate information-sharing between the third party and the utility would need to be put in place since the utilities have information on CARE enrollees’ locations and energy usage, and so that the utilities could apply appropriate bill credits to enrollees’ bills. In addition, IREC expects that CleanCARE marketing, outreach and education would be coordinated with current outreach efforts around CARE and ESAP, as well as the SASH and MASH programs, and that these existing efforts would be leveraged to keep costs low. Marketing, outreach and education efforts should also be coordinated with community-based organizations. Such marketing, education and outreach efforts should include education for participants in reading and understanding their electricity bills. In addition, a workforce development component could be incorporated into the program to maximize the benefit to disadvantaged communities.

Participation: The program administrator would sign up interested customers only after evaluating whether, by participating in CleanCARE, customers would save the same or more money as they would have under the traditional CARE program, based on their past 12 months of energy consumption. To do this, the program administrator would conduct an analysis similar to that described below regarding the program’s bill impact and in more detail in **Attachment 2**. If the program administrator were to determine that the customer would not benefit from CleanCARE (i.e., not achieve the same or better bill discount as under standard CARE), then the customer could be placed on a wait list and could have their eligibility re-evaluated the following year. Guaranteeing the participant’s bill savings going forward is discussed further below. In addition, as under the traditional CARE program, if a customer were to re-locate within a utility’s service territory, she would be able to continue her participation in CleanCARE.

Standard retail rates: In contrast to CARE participants, CleanCARE enrollees would remain on or be transferred to their utility’s standard residential rate structure instead of receiving discounted rates. The requisite CARE “bill reduction” would be achieved by reduced overall energy *bills* through kWh bill credits, rather than reduction in energy *rates*. This shift would be an important improvement over the current CARE program because it would provide CleanCARE participants with greater information concerning the cost of their energy consumption, thereby increasing their ability to manage their energy costs directly based on

consistent pricing signals over the longer term—both during enrollment in the CleanCARE program and after they have exited the program. In particular, the CleanCARE program would encourage participating customers to conserve energy, for example through energy efficiency implementation, since their remaining consumption not offset by bill credits would be at the higher standard rate than the reduced CARE rate. This is particularly important because many current CARE enrollees are only temporarily within the program but energy cost management decisions can continue to provide benefits after departing the program.

Shared distributed generation: The renewable distributed generation provided under CleanCARE would be from eligible renewable energy resources procured by the utilities through a competitive bid process and take the form of shared renewable generation of at least two types:

- Some percentage of facilities (e.g., 30 percent) would be smaller-scale generation (e.g., 1 – 100 kW) located within “disadvantaged communities,” and would include rooftop or small ground-mounted solar and potentially small-scale wind.
- The remaining capacity would be larger-scale renewable distributed generation (e.g., 101 kW – 5 MW) located in optimal locations on the electricity grid, as determined by the local distribution utility. These larger facilities, like the smaller facilities, would be located within “disadvantaged communities.”

Residents and other stakeholders from within the “disadvantaged communities” should be able to provide input regarding any facilities located in those communities. This would involve outreach to citizens, community groups, and/or local governments, and would occur through various forums, including local meetings, Commission-sponsored forums, and/or through utility or developer-led outreach, potentially in response to particular requirements in the procurement process as discussed below.

Utilizing shared renewable generation would allow for economies of scale on a programmatic basis by facilitating the installation of systems larger than those seen in on-site programs. At the same time, the “shared” aspect of these facilities can accommodate the participation of customers in the CARE program for a relatively short period of time, very likely shorter than a typical 20- or 25-year renewable energy contract. When a customer is no longer CARE-eligible and leaves the program, a new customer could participate drawn from a wait list maintained by the program administrator. Beginning with a small program and phasing in capacity would limit any negative effects on ratepayers of unexpectedly low enrollment or project failure. If a project were to fail for any reason, and therefore not generate energy and associated kWh bill credits, CleanCARE participants could be immediately transferred back to traditional CARE rates such that they would not experience any adverse bill impacts.

Moreover, to further address cost concerns, CleanCARE could be designed to unlock broader grid benefits by targeting areas of the grid identified by the local distribution utility as benefiting from renewable distributed generation and possibly energy storage. These benefits would flow to the local utilities’ ratepayers as a whole. In addition, relying on a fleet of CleanCARE facilities to serve all CleanCARE enrollees should help minimize risk as compared to a customer or group of customers relying on a single facility.

Bill credit mechanism: To realize the necessary bill reductions, CleanCARE enrollees would receive NEM kWh bill credits associated with the shared renewable generation developed under the program. The program would ensure that their electricity bills would be offset via these NEM credits at the same level or more than they currently experience under the broader CARE program. Participating customers' CARE subsidies would be used to procure renewable energy, as discussed below; the CleanCARE customer would receive a set quantity of energy from the CleanCARE renewable energy facility, via NEM bill credits, based on how much the CARE subsidy associated with customer's full bill will purchase.

CleanCARE presumes that customers would receive a full retail rate bill credit (i.e., one-to-one kWh offset), as under the current NEM program. IREC believes that full retail rate NEM should continue for all customers, however even if the Commission implements a different paradigm in place of NEM going forward, IREC suggests that full retail rate bill credits are appropriate for customers participating in CleanCARE. These customers face numerous, unique barriers to access in renewable energy, and therefore, even if the Commission determines that the costs outweigh the benefits of relying on full retail rate bill credits for general market NEM, this determination should not affect the Commission's decision with respect to CleanCARE. The Commission has the discretion to permit full retail rate NEM credits to be used within the "alternative" program for disadvantaged communities permitted by AB 327 and permitting full retail rate credits within CleanCARE helps to ensure that more customers could benefit from participation in the program. Nonetheless, in order to address concerns raised in the past by utilities and other parties about the costs of "wheeling" power to off-site customers, IREC suggests a cost adder to the all-in cost of CleanCARE solar generation to reflect distribution costs. This value stream would flow to utilities, as discussed below.

Although the Commission has approved a separate bill credit paradigm for the Green Tariff Shared Renewables (GTSR) program for off-site shared generation, it results in participants paying a premium above their normal rates to participate and therefore is not appropriate in for CleanCARE, where participants must save as much as, if not more than, they would have under the CARE rate discount. IREC notes that stakeholders will be exploring ways to enable participation by customers in disadvantaged communities in the GTSR program, as well. It is uncertain at this time what that will look like and/or when that will be made available for disadvantaged communities, however, as no proposals have been put forward or discussed to date.

Improved bill reduction: As shown in **Attachment 2**, IREC has calculated the bill impacts of CleanCARE under certain illustrative assumptions for customers consuming 400 kWh per month and 660 kWh per month in both 2015 and 2018 in each of the three utilities' service territories. We relied on the residential and CARE rates for 2015 and 2018 provided by utilities in the residential rates Rulemaking (R.) 12-06-013, which incorporate the Commission's final decision in that docket. As for the cost of solar, IREC evaluated two scenarios, both of which assumed a \$0.03 per kWh drop in solar prices between 2015 and 2018. (1) The first scenario assumes solar costs based on the utilities' Renewable Market Adjusting Tariff (ReMAT) prices for as-available peaking resources, which currently range from \$0.065 to \$0.089 per kWh. (2) The second scenario assumes somewhat higher solar costs--\$0.15 in 2015 and \$0.12 in 2018—intended to

account for potential additional costs associated with the CleanCARE program, including the requirement to locate facilities in disadvantaged communities. Ultimately, the cost of solar in the CleanCARE program would be the most competitive price received in the competitive solicitation discussed below.

For the all-in cost of CleanCARE solar generation, IREC also incorporated per-kWh adders associated with administrative costs and distribution costs, whose total value would flow to the utilities and program administrator as appropriate. IREC relied on each utility’s current distribution rate component for the distribution cost for 2015, which ranged from \$0.057 to 0.09 per kWh, and assumed an adder equivalent to the same percentage of the total retail rate in 2018 (\$0.047 to \$0.073 per kWh). In all cases, we assumed a \$0.03 per kWh adder for administrative costs.

IREC emphasizes that we evaluated all of these scenarios for illustrative purposes.

The outcomes varied across utilities and scenarios. As an example, IREC provides the analysis for an SCE customer consuming 660 kWh per month, using a solar cost based on SCE’s ReMAT rate, in both 2015 and 2018, as identified in the final order on residential rates R.12-06-013. As the tables show, such an SCE CleanCARE customer would save \$20.68 more per month in 2015 as compared to the customer’s bill on discounted CARE rates. In 2018, the customer would save even more—an additional \$46.21 per month. This customer would also be able to participate directly in renewable energy a way previously not available to them.

SCE Customer Bill Savings Under CleanCARE (2015)

	2015 CARE				2015 CleanCARE				Add'l Bill Savings
	Usage (kWh)	CARE Rate (\$/kWh)	Bill (\$)	CARE Subsidy (\$)	Ren. Energy (kWh)	Net Usage (kWh)	Res. Rate (\$/kWh)	Total Bill (\$)	
Tier 1	330	0.103	33.99	15.18		330	0.149	49.17	
Tier 2	99	0.145	14.36	6.24		83	0.208	17.30	
Tier 3	231	0.168	38.81	17.09		0	0.242	0	
TOTAL	660		87.15	38.51	247	413		66.47	20.68

SCE Customer Bill Savings Under CleanCARE (2018)

	2015 CARE				2015 CleanCARE				Add'l Bill Savings
	Usage (kWh)	CARE Rate (\$/kWh)	Bill (\$)	CARE Subsidy (\$)	Ren. Energy (kWh)	Net Usage (kWh)	Res. Rate (\$/kWh)	Total Bill (\$)	
Tier 1	330	0.112	36.96	18.15		275	0.167	45.86	
Tier 2	330	0.167	55.11	26.40		0	0.247	0	
TOTAL	660		92.07	44.55	385	275		45.86	46.21

IREC emphasizes that the bill savings associated with CleanCARE are just a piece of the benefits associated with the proposed program, which also include the benefits associated with increased renewable energy generation generally and benefits of siting those facilities in

“disadvantaged communities.” In addition, the bill savings could be improved by incorporating energy efficiency improvements into the program to further lower a customer’s bill. As discussed below, this may be more feasible as solar costs drop and a portion of the CARE funding could be transferred to energy efficiency and other demand-side management. Finally, a workforce development component to the CleanCARE program could further enhance job-related and other economic benefits to disadvantaged communities.

Guaranteed bill reduction: Guaranteeing that participants receive the same or better bill discount as under the standard CARE program is fundamental to CleanCARE. Once a customer is enrolled, IREC expects that the program administrator, in consultation with the Commission, utilities and other stakeholders, would determine the best way to guarantee the requisite bill discount on a month-to-month basis for the customer. In addition, the pilot phase could help inform the refinement of this mechanism going forward, once it is deployed in practice. In the meantime, IREC continues to solicit feedback from program administrators and utilities, both of whom have practical experience running programs, as well as other entities regarding the appropriate mechanism. In this proposal we offer, two possible mechanisms for consideration.

Option 1: Once a customer is enrolled, she would be placed in the CleanCARE queue, with her position determined by the date of her enrollment. Each month, the program administrator would evaluate the CleanCARE participant queue customer by customer. If the program administrator determines that Customer 1 would save money on CleanCARE that month based on how much energy that customer actually used in that month, then Customer 1 would participate in CleanCARE, i.e., pay for service at standard residential rates and receive the appropriate number of kWh bill credits. If not, that customer would receive service at CARE rates. The program administrator would then conduct the same evaluation for Customer 2 and so on, until all of the kWh produced by the CleanCARE project(s) that month had been allocated.

Option 2: Once a customer is enrolled, she would participate in CleanCARE for that program year unless she leaves her utility’s service territory, in which case, her share would be transferred to other customers on the wait list. There would be no penalty for leaving the program. On a monthly basis, the program administrator would evaluate the CleanCARE customer’s bill impacts under traditional CARE rates and the CleanCARE paradigm. If necessary to meet the requisite CARE bill reduction in a given month, and to account for seasonal variations of solar output over the course of the year, the program administrator would apply additional kWh bill credits to that customer’s bill for the month in order to bring her bill down to the level it would have been under the CARE program. The program administrator would set-aside a modest “bank” of kWh bill credits (e.g., five percent of the total CleanCARE generation) for this purpose, to be included as an administrative expense of the program (i.e., covered by the \$0.03 per kWh assumed administrative cost). At the end of the program year, the CleanCARE program administrator would re-evaluate each customer’s eligibility for CleanCARE. If the administrator determines that a customer did not achieve the CleanCARE bill savings on average across the year, she will be returned to CARE rates and notified accordingly. In addition, at the end of the year, any excess credits in the kWh credit “bank” would be credited to all the utilities’ ratepayers.

Regardless of the mechanism used, guaranteeing the bill discount should be a program priority and the process should also be as easy to understand as possible for participating customers.

Procurement: The utilities would use a request for offer (RFO) process to procure renewable generation facilities for the CleanCARE program, beginning with the initial pilot phase of 5 MW. The RFO would require that facilities be located within “disadvantaged communities.” Similarly bidders could be required to conduct some form of outreach with those disadvantaged communities prior to submitting a bid. The Renewable Energy Credits (RECs) associated with these facilities would be retired on behalf of participating customers.

It will be critical to ensure long-term funding for the CleanCARE renewable energy facilities such that the income stream derived from shifting the CARE rate subsidy would be locked in for a significant number of years (e.g., 10-20 years). Long-term funding of the CleanCARE program is essential because CleanCARE enrollees would not be “buying down” the upfront cost of their participation, as participants might in other renewable energy programs. Financiers will need to have the assurance of a long-term income stream.

Future “clean energy package”—energy storage, energy efficiency, demand-side management: After the initial pilot phase of the program, IREC proposes that CleanCARE would incorporate investment in a broader “clean energy package,” which would likewise be designed to achieve an equivalent or better monthly bill for CleanCARE enrollees as compared to bills they would have received under the current CARE program. In order to achieve such bill savings for CleanCARE enrollees, the “clean energy package” would incorporate energy efficiency upgrades to lower the enrollee’s overall energy consumption, in addition to the bill credits associated with participation in shared renewable energy generation.

The concept of the “clean energy package” is intentionally left flexible enough to allow for development and offering of diverse packages of targeted measures that meet the needs of CleanCARE enrollees. This flexibility should allow for packages to include an appropriate mix of energy efficiency and renewable distributed generation to achieve cost-effective bill savings for enrollees while also using energy storage and demand response to drive grid benefits. The program administrator and/or “clean energy package” offerors would be required to identify target communities, assess their energy needs, and develop a plan to meet those needs within the program parameters. Our discussions with organizations working in low-income communities on energy issues show broad support for this idea of a stable, long-term funding mechanism designed to support investment in a holistic package of services for enrollees to meet their energy needs.

The ESAP could fund energy efficiency offerings and participation in ESAP could be coordinated with the CleanCARE program enrollment process to ensure CleanCARE enrollees receive energy efficiency upgrades to reduce their consumption prior to enrollment in CleanCARE. Similarly, coordination between CleanCARE and demand response programs targeted at residential customers, such as San Diego Gas & Electric Company’s Summer Saver program, could be increased to drive overall program savings and grid benefits.

Because a “clean energy package” would introduce additional complexity into the program, IREC proposes introducing it in a later phase of the program.

Benefits of CleanCARE

The cornerstone of the CleanCARE program is that it would achieve at least the same beneficial bill impacts for enrollees as the current CARE program, and could empower program participants to achieve even better results. In addition, low-income customers enrolled in CleanCARE would be able to enjoy the benefits of renewable energy generation. On-site renewable generation programs to date have typically had high cost barriers to participation and have been largely unavailable to renters. Because enrollees would be served under their utility’s standard retail rates, CleanCARE would also more directly and continuously provide the same price signals as other customers, instead of masking those signals with below-cost rates. In the longer term, this should provide these customers the information about rates that they need to continue to make long-term decisions about energy conservation and efficiency.

In addition, CleanCARE would benefit “disadvantaged communities” in at least two ways. First, it would provide for direct participation by CARE-eligible customers in “disadvantaged communities. These customers, as well as other participating CARE-eligible customers located in other communities, would see the bill savings from participation in the CleanCARE program on their electricity bills. Second, CleanCARE would result in renewable energy development within “disadvantaged communities,” which could include both urban and rural locations. Thus although there is not complete overlap between CARE-eligible customers and customers within “disadvantaged communities,” all customers within disadvantaged communities can benefit from increased renewable generation in their communities. These include the environmental benefits of these facilities, as well as job creation and other workforce-related benefits, in particular if a job training component is incorporated into the program.

CleanCARE should also drive down rates for all California energy consumers as it represents a more efficient use of ratepayer funds for low-income assistance. Importantly, if implemented quickly, development of CleanCARE resources would allow California to leverage the full 30% federal Investment Tax Credit, set to decrease to 10% on Jan 1, 2017. This would result in a 30% reduction in the price of the renewable distributed generation used to serve the program along with an additional 20% reduction in cost via accelerated depreciation. Additionally, by installing renewable distributed generation at locations on the grid identified by utilities as benefiting from DG, CleanCARE would maximize grid benefits from the program, which in turn should help to drive down all energy customers’ rates over time.

Beyond these benefits, the modifications to the CARE program embodied in CleanCARE are aligned with California’s overall renewable energy goals. These include the Commission’s loading order, the 33% Renewable Portfolio Standard and the Governor’s 50% renewable energy and 12,000-MW distributed generation goals.

Attachment B-2
CleanCARE Analysis

PG&E CleanCARE Analysis

Scenario 1 -- higher solar cost

Scenario 1a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.109	35.97	19.56		305	0.168	51.39	0.259	
Tier 2	70	0.130	9.09	4.97		-	0.201	-		
Tier 3	0	0.165	-	-		-	0.255	-		
Total	400		45.06	24.53	95	305		51.39	(6.33)	

Scenario 1b -- 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.109	35.97	19.56		330	0.168	55.53	0.259	
Tier 2	99	0.130	12.86	7.03		99	0.201	19.90		
Tier 3	231	0.165	38.15	20.86		48	0.255	12.27		
Total	660		86.98	47.45	183	477		87.69	(0.71)	

Scenario 1c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.118	38.81	21.14		270	0.182	49.08	0.209	
Tier 2	70	0.156	10.89	5.96		-	0.241	-		
Total	400		49.70	27.10	130	270		49.08	0.62	

Scenario 1d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.118	38.81	21.14		330	0.182	59.95	0.209	
Tier 2	330	0.156	51.34	28.08		94	0.241	22.66		
Total	660		90.15	49.23	236	424		82.61	7.54	

ALL RATES FROM IOUs' RROIR TABLES

Current PG&E CARE Tier 1 Rate	0.109
Current PG&E CARE Tier 2 Rate	0.130
Current PG&E CARE Tier 3 Rate	0.165
Current PG&E CARE Tier 4 Rate	0.165
Current PG&E Non-CARE Tier 1 Rate	0.168
Current PG&E Non-CARE Tier 2 Rate	0.201
Current PG&E Non-CARE Tier 3 Rate	0.255
Current PG&E Non-CARE Tier 4 Rate	0.325
Current PG&E Tier 1 Subsidy	0.059
Current PG&E Tier 2 Subsidy	0.071
Current PG&E Tier 3 Subsidy	0.090
Current PG&E Tier 4 Subsidy	0.160
2018 PG&E Proposed CARE Tier 1 Rate	0.118
2018 PG&E Proposed CARE Tier 2 Rate	0.156
2018 PG&E Proposed Non-CARE Tier 1 Rate	0.182
2018 PG&E Proposed Non-CARE Tier 2 Rate	0.241
2018 PG&E Tier 1 Subsidy	0.06
2018 PG&E Tier 2 Subsidy	0.09

Assumes average baseline of 330 kWh per month. Actual baseline varies by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 100% of baseline. Assumes full retail rate NEM credit.

Scenario 2 -- Re-MAT based solar cost

Scenario 2a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.109	35.97	19.56		259	0.168	43.66	0.175	
Tier 2	70	0.130	9.09	4.97		-	0.201	-		
Tier 3	0	0.165	-	-		-	0.255	-		
Total	400		45.06	24.53	141	259		43.66		1.40

Scenario 2b -- 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.109	35.97	19.56		330	0.168	55.53	0.175	
Tier 2	99	0.130	12.86	7.03		58	0.201	11.69		
Tier 3	231	0.165	38.15	20.86		-	0.255	-		
Total	660		86.98	47.45	272	388		67.22		19.76

Scenario 2c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.118	38.81	21.14		181	0.182	32.87	0.124	
Tier 2	70	0.156	10.89	5.96		-	0.241	-		
Total	400		49.70	27.10	219	181		32.87		16.83

Scenario 2d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.118	38.81	21.14		262	0.182	47.61	0.124	
Tier 2	330	0.156	51.34	28.08		-	0.241	-		
Total	660		90.15	49.23	398	262		47.61		42.54

ALL RATES FROM IOUs' RROIR TABLES

Current PG&E CARE Tier 1 Rate	0.109
Current PG&E CARE Tier 2 Rate	0.130
Current PG&E CARE Tier 3 Rate	0.165
Current PG&E CARE Tier 4 Rate	0.165
Current PG&E Non-CARE Tier 1 Rate	0.168
Current PG&E Non-CARE Tier 2 Rate	0.201
Current PG&E Non-CARE Tier 3 Rate	0.255
Current PG&E Non-CARE Tier 4 Rate	0.325
Current PG&E Tier 1 Subsidy	0.059
Current PG&E Tier 2 Subsidy	0.071
Current PG&E Tier 3 Subsidy	0.090
Current PG&E Tier 4 Subsidy	0.160
2018 PG&E Proposed CARE Tier 1 Rate	0.118
2018 PG&E Proposed CARE Tier 2 Rate	0.156
2018 PG&E Proposed Non-CARE Tier 1 Rate	0.182
2018 PG&E Proposed Non-CARE Tier 2 Rate	0.241
2018 PG&E Tier 1 Subsidy	0.06
2018 PG&E Tier 2 Subsidy	0.09

Assumes average baseline of 330 kWh per month. Actual baseline varies by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 100% of baseline. Assumes full retail rate NEM credit.

SCE CleanCARE Analysis

Scenario 1 -- higher solar cost

Scenario 1a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.103	33.99	15.18		317	0.149	47.27	0.237	
Tier 2	70	0.145	10.15	4.41		-	0.208	-		
Tier 3	0	0.168	-	-		-	0.242	-		
Total	400		44.14	19.59	83	317		47.27		(3.13)

Scenario 1b -- 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.103	33.99	15.18		330	0.149	49.17	0.237	
Tier 2	99	0.145	14.36	6.24		99	0.208	20.59		
Tier 3	231	0.168	38.81	17.09		68	0.242	16.54		
Total	660		87.15	38.51	163	497		86.31		0.85

Scenario 1c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.112	36.96	18.15		279	0.167	46.63	0.197	
Tier 2	70	0.167	11.69	5.60		-	0.247	-		
Total	400		48.65	23.75	121	279		46.63		

Scenario 1d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.112	36.96	18.15		330	0.167	55.11	0.197	
Tier 2	330	0.167	55.11	26.40		103	0.247	25.54		
Total	660		92.07	44.55	227	433		80.65		

ALL RATES FROM IOUs' RROIR TABLES

Current Average CARE Tier 1 Rate	0.103
Current Average CARE Tier 2 Rate	0.145
Current Average CARE Tier 3 Rate	0.168
Current Average CARE Tier 4 Rate	0.168
Current Average Non-CARE Tier 1 Rate	0.149
Current Average Non-CARE Tier 2 Rate	0.208
Current Average Non-CARE Tier 3 Rate	0.242
Current Average Non-CARE Tier 4 Rate	0.301
Current Average Tier 1 Subsidy	0.046
Current Average Tier 2 Subsidy	0.063
Current Average Tier 3 Subsidy	0.074
Current Average Tier 4 Subsidy	0.133
2018 Average Proposed CARE Tier 1 Rate	0.112
2018 Average Proposed CARE Tier 2 Rate	0.167
2018 Average Proposed Non-CARE Tier 1 Rate	0.167
2018 Average Proposed Non-CARE Tier 2 Rate	0.247
2018 Average Tier 1 Subsidy	0.06
2018 Average Tier 2 Subsidy	0.08

Assumes average baseline of 330 kWh per month. Actual baseline varies by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 100% of baseline. Assumes full retail rate NEM credit.

Scenario 2 -- Re-MAT based solar cost

Scenario 2a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.103	33.99	15.18		274	0.149	40.89	0.156	
Tier 2	70	0.145	10.15	4.41		-	0.208	-		
Tier 3	0	0.168	-	-		-	0.242	-		
Total	400		44.14	19.59	126	274		40.89	3.25	

Scenario 2b - 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.103	33.99	15.18		330	0.149	49.17	0.156	
Tier 2	99	0.145	14.36	6.24		83	0.208	17.30		
Tier 3	231	0.168	38.81	17.09		-	0.242	-		
Total	660		87.15	38.51	247	413		66.47	20.68	

Scenario 2c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.112	36.96	18.15		195	0.167	32.49	0.116	
Tier 2	70	0.167	11.69	5.60		-	0.247	-		
Total	400		48.65	23.75	205	195		32.49		16.16

Scenario 2d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.112	36.96	18.15		275	0.167	45.86	0.116	
Tier 2	330	0.167	55.11	26.40		-	0.247	-		
Total	660		92.07	44.55	385	275		45.86		46.21

ALL RATES FROM IOUs' RROI TABLES

Current Average CARE Tier 1 Rate	0.103
Current Average CARE Tier 2 Rate	0.145
Current Average CARE Tier 3 Rate	0.168
Current Average CARE Tier 4 Rate	0.168
Current Average Non-CARE Tier 1 Rate	0.149
Current Average Non-CARE Tier 2 Rate	0.208
Current Average Non-CARE Tier 3 Rate	0.242
Current Average Non-CARE Tier 4 Rate	0.301
Current Average Tier 1 Subsidy	0.046
Current Average Tier 2 Subsidy	0.063
Current Average Tier 3 Subsidy	0.074
Current Average Tier 4 Subsidy	0.133
2018 Average Proposed CARE Tier 1 Rate	0.112
2018 Average Proposed CARE Tier 2 Rate	0.167
2018 Average Proposed Non-CARE Tier 1 Rate	0.167
2018 Average Proposed Non-CARE Tier 2 Rate	0.247
2018 Average Tier 1 Subsidy	0.06
2018 Average Tier 2 Subsidy	0.08

Assumes average baseline of 330 kWh per month. Actual baseline varies by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 100% of baseline. Assumes full retail rate NEM credit.

SDG&E CleanCARE Analysis

Scenario 1 -- higher solar cost

Scenario 1a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.107	35.31	24.42		288	0.181	52.13	0.269	
Tier 2	70	0.123	8.61	5.74		-	0.205	-		
Tier 3	0	0.245	-	-		-	0.396	-		
Total	400		43.92	30.16	112	288		52.13	(8.21)	

Scenario 1b -- 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.107	35.31	24.42		330	0.181	59.73	0.269	
Tier 2	99	0.123	12.18	8.12		80	0.205	16.32		
Tier 3	231	0.245	56.60	34.88		-	0.396	-		
Total	660		104.08	67.42	250	410		76.05	28.03	

Scenario 1c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	400	0.149	59.60	35.20		242	0.237	57.32	0.223	
Tier 2	0	0.205	-	-		-	0.322	-		
Total	400		59.60	35.20	158	242		57.32		2.28

Scenario 1d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	429	0.149	63.92	37.75		369	0.237	87.45	0.223	
Tier 2	231	0.205	47.36	27.03		-	0.322	-		
Total	660		111.28	64.78	291	369		87.45		23.83

ALL RATES FROM IOUs' RROIR TABLES

Current SDG&E CARE Tier 1 Rate	0.107
Current SDG&E CARE Tier 2 Rate	0.123
Current SDG&E CARE Tier 3 Rate	0.245
Current SDG&E CARE Tier 4 Rate	0.245
Current SDG&E Non-CARE Tier 1 Rate	0.181
Current SDG&E Non-CARE Tier 2 Rate	0.205
Current SDG&E Non-CARE Tier 3 Rate	0.396
Current SDG&E Non-CARE Tier 4 Rate	0.396
Current SDG&E Tier 1 Subsidy	0.074
Current SDG&E Tier 2 Subsidy	0.082
Current SDG&E Tier 3 Subsidy	0.151
Current SDG&E Tier 4 Subsidy	0.151
2018 SDG&E Proposed CARE Tier 1 Rate	0.149
2018 SDG&E Proposed CARE Tier 2 Rate	0.205
2018 SDG&E Proposed Non-CARE Tier 1 Rate	0.237
2018 SDG&E Proposed Non-CARE Tier 2 Rate	0.322
2018 SDG&E Tier 1 Subsidy	0.09
2018 SDG&E Tier 2 Subsidy	0.12

Assumes average baseline usage of 330 kWh per month. Actual baseline will vary by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 130% of baseline. Assumes full retail rate NEM credit.

Scenario 2 -- Re-MAT based solar cost

Scenario 2a -- 2015 -- Tier 2 Customer (400 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.107	35.31	24.42		255	0.181	46.22	0.208	(2.30)
Tier 2	70	0.123	8.61	5.74		-	0.205	-		
Tier 3	0	0.245	-	-		-	0.396	-		
Total	400		43.92	30.16	145	255		46.22		

Scenario 2b -- 2015 -- Tier 3 Customer (660 kWh per month)

	2015 CARE				2015 CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	330	0.107	35.31	24.42		330	0.181	59.73	0.208	42.81
Tier 2	100	0.123	12.30	8.20		7	0.205	1.42		
Tier 3	230	0.245	56.35	34.73		-	0.396	-		
Total	660		103.96	67.35	323	337		61.15		

Scenario 2c -- 2018 -- 400 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	400	0.149	59.60	35.20		182	0.237	43.18	0.162	16.42
Tier 2	0	0.205	-	-		-	0.322	-		
Total	400		59.60	35.20	218	182		43.18		

Scenario 2d -- 2018 -- 660 kWh per month

	2018 CARE				2018 Clean CARE				Solar Cost	Bill Savings
	Usage	Rate (CARE)	Bill	Subsidy	kWh Subsidy	Net Usage	Rate (Non-CARE)	Total Bill		
Tier 1	429	0.149	63.92	37.75		259	0.237	61.41	0.162	49.86
Tier 2	231	0.205	47.36	27.03		-	0.322	-		
Total	660		111.28	64.78	401	259		61.41		

ALL RATES FROM IOUs' RROIR TABLES

Current SDG&E CARE Tier 1 Rate	0.107
Current SDG&E CARE Tier 2 Rate	0.123
Current SDG&E CARE Tier 3 Rate	0.245
Current SDG&E CARE Tier 4 Rate	0.245
Current SDG&E Non-CARE Tier 1 Rate	0.181
Current SDG&E Non-CARE Tier 2 Rate	0.205
Current SDG&E Non-CARE Tier 3 Rate	0.396
Current SDG&E Non-CARE Tier 4 Rate	0.396
Current SDG&E Tier 1 Subsidy	0.074
Current SDG&E Tier 2 Subsidy	0.082
Current SDG&E Tier 3 Subsidy	0.151
Current SDG&E Tier 4 Subsidy	0.151
2018 SDG&E Proposed CARE Tier 1 Rate	0.149
2018 SDG&E Proposed CARE Tier 2 Rate	0.205
2018 SDG&E Proposed Non-CARE Tier 1 Rate	0.237
2018 SDG&E Proposed Non-CARE Tier 2 Rate	0.322
2018 SDG&E Tier 1 Subsidy	0.09
2018 SDG&E Tier 2 Subsidy	0.12

Assumes average baseline usage of 330 kWh per month. Actual baseline will vary by IOU and climate region. In 2015, Tier 1 is baseline, Tier 2 is 100-130% of baseline, Tier 3 is 130-200% of baseline. In 2018, Tier 1 is baseline and Tier 2 is > 130% of baseline. Assumes full retail rate NEM credit.

COST ASSUMPTIONS				
COST OF SOLAR	2015	2018		
Higher cost	0.150	0.120		
PG&E ReMAT	0.065	0.035		
SCE ReMAT	0.069	0.039		
SDG&E ReMAT	0.089	0.059		
(ReMAT July 2015)		(assumes .03 reduction in cost 2015-2018)		
DISTRIBUTION	2015	2018		% 2015 T4 rate
PG&E Rate - D component	0.079	0.059		24.39%
SCE Rate - D component	0.057	0.047		18.87%
SDG&E Rate - D component	0.089	0.073		22.55%
		(assumes same % of rate in 2018 as in 2015)		
ADMIN	2015	2018		
Admin. assumption	0.030	0.030		