**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

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| **IN THE MATTER OF A COMMISSION INQUIRY INTO PUBLIC UTILITIES CONSTRUCTING AND OWNING DISTRIBUTED GENERATION DEDICATED TO SERVING ONE OR MORE RETAIL CUSTOMERS** | ) ) ) ) ) | **Case No. 15-00355-UT** |

**SUPPLEMENTAL COMMENTS OF VOTE SOLAR**
**December 15, 2016**

Vote Solar appreciates the opportunity to share additional thoughts and perspectives with the Commission regarding issues related to utility construction and ownership of distributed generation facilities based upon our work across the West and around the country. Our initial comments responding to the Commission's November 18, 2015 Notice of Inquiry were generally supportive of utility construction and ownership of such facilities because of the potential administrative and financial efficiencies. However, we also urged caution to assure the utility does not use its monopoly position in the market and its access to customer information to unfairly compete with private distributed generation developers. In our view, a separate non-regulated utility affiliate is the cleanest way for a utility to participate in this market.

These supplemental comments provide updated information regarding several of the questions in the original Notice, responses to the additional questions in the Commission's November 14, 2016 Order Requesting Additional or Supplemental Information, and further comments resulting from the Workshop held on November 9, 2016.

Please note that we discuss at length programs to increase accessibility to low-income customers and group purchases of solar resources. Vote Solar would be happy to arrange for presentations to the Commission on either or both of these concepts.

## Updated Information re. November 18, 2015 Notice of Inquiry (NOI)

NOI Question 6A

Our initial response addressed a utility-owned community solar program in Colorado called Solar*Connect proposed by the sister Company of SPS. While the original proposal was rejected by the Colorado PUC primarily on anti-competitive grounds, the Company filed a similar but revised version in early 2016. The new subscription offering is a fully regulated product, structured to be priced at a premium . While this proposal – now known as Renewable*Connect – was resolved through a settlement of three formal proceedings, and involved tradeoffs as all settlements do, there remain concerns among some stakeholders about the impacts of this new program on the competitive solar market in

Colorado. Nevertheless, we appreciate the efforts of Xcel/Colorado to develop new opportunities for its customers to access the benefits of solar resources, and the Colorado experience may provide useful information to this Commission in its deliberations in this matter.

In Nevada earlier this year, Governor Sandoval established the New Energy Industry Task Force (NEITF) to develop recommendations for his office to bring to the legislature. This work was completed at the last Task Force meeting on September 27, 2016. Recommendation 9 from the Distributed Generation and Storage Technical Advisory Committee was approved unanimously by the Task Force and reads as follows:

> A recommendation that the 2017 Legislature consider enabling legislation and to authorize the PUCN to adopt appropriate guidelines to implement community solar (also called Shared Solar, Community Solar Gardens, Solar Gardens) with a focus on expanding solar access to communities of color and low income neighborhoods.

The NEITF also provided some background information on this recommendation in line with the above discussion:

> ***Background:*** The traditional panels-on-your-roof approach to solar simply doesn't work for a majority of Americans. A majority of Americans face physical barriers that keep them from installing solar on their own rooftop. A report from the National Renewable Energy Lab and Navigant Consulting found that 73-78 percent of homes cannot host solar due to tree shading, orientation or other factors. Moreover, 52 percent of residents nationwide live in multi-unit buildings or homes with shared roofs.
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> Renters have difficulty participating in rooftop solar even if their home is suitable. The sheer diversity of ways in which tenants receive and pay for their electricity makes solar participation complex. Some pay their own utility bills, some share a meter and split payments with other renters, and in other cases the landlord pays for utilities and passes a portion of those costs on to the tenant. In all of these cases, there is a fundamental disconnect between the entity that would benefit most from the utility bill savings of solar (the tenant) and the entity who would need to make or approve the solar investment (the property owner).
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> These issues are particularly pronounced for low-income households, which are more likely to live in multifamily housing, have unsuitable roofs or rent their homes. Community solar addresses these barriers by allowing consumers to subscribe to a local clean energy project and receive credit on their utility bills for their portion of the clean power produced. Fourteen states and the District of Columbia have community solar policies in place, and many more are considering programs to expand consumer access to clean energy.

NOI Question 6B

Our initial response addressed some of the ratemaking questions related to utility ownership such as segregation of costs and revenues for distributed generation services. We would like to supplement that response now by providing additional information regarding the long term costs and benefits of distributed generation. A recent paper[1] from the Brookings Institute summarized five recent studies sponsored by agencies of state government as follows:

> [b]y the end of 2015, regulators in at least 10 states had conducted studies to develop methodologies to value distributed generation and net metering, while other states conducted less formal inquiries, ranging from direct rate design or net-metering policy changes to general education of decision makers and the public. And there is a degree of consensus. What do the commission-sponsored analyses show? A growing number show that net metering benefits all utility customers:
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> In 2013 Vermont's Public Service Department conducted a study that concluded that "net- metered systems do not impose a significant net cost to ratepayers who are not net- metering participants." The legislatively mandated analysis deemed the policy a successful component of the state's overall energy strategy that is cost effectively advancing Vermont's renewable energy goals.
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> In 2014 a study commissioned by the Nevada Public Utility Commission itself concluded that net metering provided $36 million in benefits to all NV Energy customers, confirming that solar energy can provide cost savings for both solar and non-solar customers alike. What's more, solar installations will make fewer costly grid upgrades necessary, leading to additional savings. The study estimated a net benefit of $166 million over the lifetime of solar systems installed through 2016. Furthermore, due to changes to utility incentives and net-metering policies in Nevada starting in 2014, solar customers would not be significantly shifting costs to other ratepayers.
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> A 2014 study commissioned by the Mississippi Public Services Commission concluded that the benefits of implementing net metering for solar PV in Mississippi outweigh the costs in all but one scenario. The study found that distributed solar can help avoid significant infrastructure investments, take pressure off the state's oil and gas generation at peak demand times, and lower rates. (However, the study also warned that increased penetrations of distributed solar could lead to lower revenues for utilities and suggested that the state investigate Value of Solar Tariffs, or VOST, and other alternative valuations to calculate the true cost of solar.)
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> In 2014 Minnesota's Public Utility Commission approved a first-ever statewide "value of solar" methodology which affirmed that distributed solar generation is worth more than its retail price and concluded that net metering undervalues

[1] Muro, M and Saha, S, "Rooftop solar: Net metering is a net benefit," Brookings Institute, May, 2016.

rooftop solar. The "value of solar" methodology is designed to capture the societal value of PV-generated electricity. The PUC found that the value of solar was at 14.5 cents per kilowatt hour (kWh)—which was 3 to 3.5 cents more per kilowatt than Xcel's retail rates—when other metrics such as the social cost of carbon, the avoided construction of new power stations, and the displacement of more expensive power sources were factored in.

Another study commissioned by the Maine Public Utility Commission in 2015 put a value of $0.33 per kWh on energy generated by distributed solar, compared to the average retail price of $0.13 per kWh — the rate at which electricity is sold to residential customers as well as the rate at which distributed solar is compensated. The study concludes that solar power provides a substantial public benefit because it reduces electricity prices due to the displacement of more expensive power sources, reduces air and climate pollution, reduces costs for the electric grid system, reduces the need to build more power plants to meet peak demand, stabilizes prices, and promotes energy security. These avoided costs represent a net benefit for non-solar ratepayers.

These generally positive PUC conclusions about the benefits of net metering have been supported by research done by a national lab and several think tanks. Important lab research has examined how substantially higher adoption of distributed resources might look.

The five referenced studies are available at:

Me. Pub. Utils. Comm'n, *Maine Distributed Solar Valuation Study* 6 (Apr. 2015), *available at* http://www.maine.gov/mpuc/electricity/elect_generation/documents/MainePUCVOS-FullRevisedReport_4_15_15.pdf.

Elizabeth A. Stanton et al., Synapse Energy Econ., Inc., *Net Metering in Mississippi: Costs, Benefits, and Policy Considerations* 43 (Sept. 2014), *available at* http://www.synapse-energy.com/sites/default/files/Net%20Metering%20in%20Mississippi.pdf.

Energy & Envtl. Econ., *Nevada Net Energy Metering Impacts Evaluation* 93 (July 2014), *available at* http://puc.nv.gov/uploadedFiles/pucnvgov/Content/About/Media_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf?pdf=Net-Metering-Study.

Peter Fairley, *Minnesota Finds Net Metering Undervalues Rooftop Solar*, IEEE Spectrum (Mar. 24, 2014), *available at* http://spectrum.ieee.org/energywise/green-tech/solar/minnesota-finds-net-metering-undervalues-rooftop-solar.

Vt. Pub. Serv. Dep't, *Evaluation of Net Metering in Vermont Conducted Pursuant to Act 99 of 2014*, at 17 (Nov. 2014), *available at* http://psb.vermont.gov/sites/psb/files/Act%2099%20NM%20Study%20Revised%20v1.pdf.

**Responses to Questions in November 14, 2016 Order Requesting Additional or Supplemental Information**

(i) What federal and state, or local tax incentives for either capital investment or operating revenue income are available to utilities and non-regulated utility affiliates that undertake the construction and operation of customer-sited DG systems (e.g. rooftop solar, etc.) and DG systems remote from the customer sites (e.g. community solar, utility scale solar, etc.)? Describe how the incentives are implemented by the utility and the utility affiliate and also state what the current status is of each incentive (e.g., sunset dates, current subscription levels, etc).

The most significant incentive for solar DG systems is the 30% federal investment tax credit (ITC) which is scheduled to phase out for residential installations and down to 10% for commercial over the next 5-6 years. This credit is available to customers who acquire solar DG systems in an ownership model *and who have sufficient taxable income*. Alternate financing models for DG are widely available in today's market that sell the benefits of the ITC to an entity with an "appetite" for tax credits and pass on the net benefits of the ITC to the utility customer in a PPA arrangement.

Notably, investor-owned utilities have not been able to take advantage of the ITC and pass the bulk of the savings on to their customers through lower cost of service because this would result in a "normalization violation," as was briefly discussed by PNM in its presentation. However, recent rulings from the IRS indicate that it is possible for an IOU to pass on most of the benefits of the ITC to customers if the associated rates are set on a market index, instead of a cost-basis. In order for an IOU or affiliate to offer a competitive price in the DG market against other market participants who have no problem monetizing the full benefits of the ITC, the IOU (or affiliate) would need approval from the Commission to use a non-traditional method (i.e., non-cost based) of setting rates for the DG service. Operating a DG program through a non-regulated affiliate does not solve the normalization problem, based on the recent IRS private letter rulings, the only solution is non-cost based rates. Given that there are a multitude of non-utility participants in the market, it is probably not worth the additional efforts needed to enable utilities to offer competitive products in markets that are already well-served. On the other hand, as discussed below, there are markets such as the low income/low density/rural markets where utilities could be desirable players.

(ii) If a utility was to consider building a community solar garden or utility scale solar system to serve primarily low income customers in a rural or a low customer

density area of New Mexico, what financial and non-financial considerations should the utility include in its evaluation? Could the utility propose special-customer rates in such an instance that are not discriminatory and what would be the general characteristics of the proposed rates?

Vote Solar believes that the incumbent utilities have significant financial and administrative advantages that can and should be used to increase accessibility to low-income customers. Moreover, the concepts that are embodied in economic development rates can also be used to help meet the energy needs of New Mexico's most vulnerable populations. Carefully crafted mechanisms that capture utility-based economies and existing low-income programs are part of the solution. Each step in the process of program development and implementation should include the communities for whom increased solar access is intended. In addition, competitive markets should be examined and tested to determine the potential for improved prices.

In recent years, Vote Solar has stood with community and equity groups to advance solar programs with low-income provisions in California, Colorado, Massachusetts, and New York. Earlier in 2016, Vote Solar formally launched a Low-Income Solar Access Program, designed to expand access to solar technology, savings and jobs to the approximately 22 million low-income households nationwide. Vote Solar's program puts a particular focus on engaging and empowering low-income families and communities of color who are disproportionately impacted by the negative effects of the fossil fuel economy and have the most to gain from a transition to affordable clean energy. An initial program offering is a Low-Income Solar Policy Guide, which Vote Solar developed in conjunction with GRID Alternatives and the Center for Social Inclusion.[2]

When considering the design of a potential community solar garden program to serve primarily low income customers, the utility should begin its evaluation by considering how its program can meet the following basic principles, which are outlined in the Low-Income Solar Policy Guide.

- **Accessibility and Affordability.** An effective low-income solar program combines opportunities to participate with real financial benefits through a combination of deep/meaningful energy cost savings and direct support to overcome some of the financial and other challenges to access.

- **Community Engagement.** A successful program requires partnership with communities through local partners such as community development corporations, affordable housing organizations, nonprofits, or other service providers to ensure that community needs and challenges are addressed and assets utilized. These partners can provide critical outreach, planning support, and engagement with low-

[2] Center for Social Inclusion, GRID Alternatives, Vote Solar, Low-Income Solar Policy Guide (2016) *available at* www.lowincomesolar.org.

income communities. Putting communities at the center ensures that programs are responsive and effective and helps maximize participation.

- **Consumer Protection.** Programs should not create incentives for predatory lending or exploitation of communities for financial gain. Programs should have adequate consumer protection measures, disclosures, and accountability measures to ensure that financially vulnerable customers are not taken advantage of or otherwise compromised.

- **Sustainability and Flexibility.** A successful low-income solar program must encourage long-term market development and be flexible in order to best serve the unique low-income market segment over time and as conditions and circumstances change.

- **Compatibility and Integration.** Low-income solar programs and policies should be additive to existing renewable energy and energy efficiency programs, not undermine them. They should also integrate well with synergistic programs, such as low-income energy efficiency, workforce development, healthy home programs and others that address the intersection of equity, energy and infrastructure.
    - Job training should be a discrete provision in any utility-provided program.

In sum, the guide recommends utilities partner with community based organizations or nonprofits to design a program or project that maximizes value for the low-income participants (e.g. meaningful bill savings requirements, coordination with efficiency programs, other consumer protections), and generates opportunity for meaningful engagement (e.g. siting proximity, training opportunities during installation, customer engagement in the planning process, etc.).

It is not a coincidence that "Accessibility and Affordability" is the first principle outlined in the Low-Income Solar Policy Guide. One of the primary goals of a community solar garden program serving low-income customers should be a reduction of customers' energy burden. Low-income households typically spend a significantly higher percentage of their income to pay for energy than their higher-income neighbors.[3] These customers stand to benefit considerably from renewable energy programs that can deliver bill savings.

Utilities in New Mexico can learn from programs in place in other states. For example, an innovative low-income community solar program is being administered by Grand Valley Power in Colorado, in partnership with GRID Alternatives. The program is forecast to save

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[3] *See* Center for American Progress, State Policies to Increase Low Income Communities' Access to Solar Power (2014), *available at* https://www.americanprogress.org/issues/green/reports/2014/09/23/97632/state-policies-to-increase-low-income-communities-access-to-solar-power/.

each participating low-income customer approximately $600 per year.[4] Participating community solar customers receive full retail net metering credit for the energy that is generated by the community solar array. There is no upfront cost to participating customers, but they do pay a 2 cent per kWh participant fee to defray management costs. Customers can participate in the program for four years, after which time the block of solar panels is assigned to another qualifying customer for four more years. While a four-year limit on participation is not ideal, this model is an innovative way to allow multiple low-income families to save a projected $2,400 over the course of their participation in the program.

The success or failure of a community solar program will depend to a large extent on the value of the program to the customer. This is especially true for a program that is designed to serve low-income customers. Community solar for low-income customers must include full retail rate crediting in order to maximize energy savings. One of the reasons to implement community solar is to extend the benefits of net metering to customers who cannot have onsite solar projects. Therefore, it is paramount to ensure that community solar subscribers receive the same credit value as though they were net metering customers.

Other important features of community solar programs to serve low-income customers include community engagement, sustained funding, a job training component, and integration with other programs. Legislation enacted earlier this month in Illinois, the Illinois Future Energy Jobs Bill (SB 2814), includes these elements and others in the creation of the Illinois Solar for All Program.[5] This program is focused on ensuring that low-income communities in Illinois will participate in and benefit from the development of solar projects in that state, with particular programs for community solar. The legislation specifies that solar developers must engage in partnership with community stakeholders when planning community solar projects. And, the bill includes funding for community-based organizations to engage in grassroots education about the Solar for All Program. Community stakeholders can provide critical outreach, planning support, and engagement with the surrounding community. By including this requirement and the funding to back it up, the Future Energy Jobs Bill helps to ensure that the community solar program will be responsive and effective, and help maximize participation. What's more, the development of the Solar for All Program and the concepts for solar job training in the bill included community engagement in the legislative process.

Of utmost importance, the Future Energy Jobs Bill includes sustained funding for the Solar for All Program. Additionally, the bill provides opportunities for regular evaluation of the

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[4] Solar Electric Power Association, Solar Success for Nonprofit Utilities: Grand Valley Community Solar Program (2015), *available at* http://solaroutreach.org/wp-content/uploads/2015/08/SEPA_SolarOPsCaseStudy_GVP_FINAL.pdf.

[5] Il. Gen. Assembly, *Future Energy Jobs* (SB 2814), 2016 Veto Sess. (Dec. 7, 2016), *available at* http://www.ilga.gov/legislation/BillStatus.asp?DocNum=2814&GAID=13&DocTypeID=SB&LegID=96125&SessionID=88&SpecSess=&Session=&GA=99.

Solar for All Program, and opportunities to make adjustments. The inclusion of this type of flexibility will help ensure the program will be successful in the long-term.

In addition to stating a goal of reducing low-income customers' bills, the Illinois Future Energy Jobs Bill requires that the Solar for All program include integration with energy efficiency programs. The program also includes funding for a solar jobs training program. Moreover, the legislation includes a requirement for solar providers participating in the program to hire job trainees. By ensuring that the buildout of solar in Illinois is done in synergy with other important programs, the bill does an outstanding job of addressing the intersection of equity, energy, and infrastructure.

## Comments related to the November 9, 2016 Workshop

### *(1) Addressing LMI customer needs through Community Solar*

In many states, traditional rooftop solar is available to low and moderate income (LMI) households as a result of recent innovations in financing including leasing, low to no-interest loans, and property-assessed clean energy (PACE) financing. These types of mechanisms help to overcome the financing barrier but only work in places where the incumbent utility does not place addition cost burdens on such systems.

Community solar has the potential to address a number of LMI customer needs. First, as discussed above, community solar can provide financial relief to LMI households through solar displacement, that is, through virtually transferring the economic benefits available from community solar projects to individual customers. Additionally, low-income communities are more likely to be located near fossil fuel fired power plants. The emissions from these plants include toxins like mercury, lead, arsenic, sulfur dioxide and nitrogen oxide. These toxins contribute to poor health effects like asthma, heart disease and cancer. Proximity to a power plant has a negative effect on property values, in addition to potential pollution affecting the air, water, and land. Community solar decreases the need for fossil fueled power plants to operate, thereby creating a pathway toward cleaner, healthier communities.

Moreover, a community solar program that includes a workforce training component, which Vote Solar recommends, creates a pathway for low-income customers to enter the growing solar economy. In 2015, employment in the solar industry grew by over 20 percent, providing skilled, well-paying jobs. A well-crafted community solar program that includes workforce training can create more financial freedom for low-income families.

Deployment of solar across the nation has soared in recent years, due to falling solar costs, the development of innovative customer financing options, and supportive policies and programs. However, despite these trends, the deployment of solar for low-income communities has been slow. This is because there are unique barriers to this sort of deployment, which require direct and targeted policies and programs aimed at serving these customers. These barriers include:

- **Cost Sensitivity**. As discussed above, solar can stabilize families' energy bills and protect against increases in electricity rates. However, the investment required to purchase solar remains a significant barrier for the families who most need relief from rising bills – those who struggle to make ends meet every month. An average four to eight kilowatt (kW) solar electric system on a home can cost between $12,000 and $26,000 including materials, installation, and labor.[6] This type of investment is cost-prohibitive for low-income families. The Grand Valley Power example shows that a utility sponsored community solar program for low-income customers can overcome this barrier. A utility program can provide access to community solar with no up-front expense for the customer, and minimal participation fees over time.

- **Access to Financing.** Financing mechanisms that are commonly used to enable homeowners to install solar with little or no upfront costs, such as leasing or power purchase agreement (PPA) relationships have contributed to the growth of residential solar across the U.S. and accounted for 72 percent of U.S. residential solar installations in 2014.[7] However, participation in these models generally requires a credit score or debt-to-income ratio minimum that can be a barrier to low-income consumers and people of color who, on average, have lower credit scores. Various types of loans, such as home equity loans, also usually require good credit. According to a Federal Reserve study of one form of credit score, individuals in low-income areas had an average score 44 percent lower than individuals in high-income areas. At the same time, African Americans had a score 52 percent lower than non-Latino white individuals and Latino Americans have average scores 29 percent lower than non-Latino white individuals.[8] These disparities in credit scores limit access to third-party ownership or financing arrangements and loans for solar for the very populations that could most benefit from the low-upfront cost options. A utility sponsored community solar program can obviate the need for customer financing through on-bill financing or other mechanisms.

- **Physical Barriers, Home Ownership and Housing Conditions.** As a starting point, a majority of Americans across the income spectrum face physical barriers that keep them from installing solar on their own rooftop. As mentioned previously, a report from the National Renewable Energy Lab and Navigant Consulting found that 73-78 percent of homes cannot host solar due to tree shading, orientation or

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[6] *See* GTM Research, Solar Energy Industries Association, U.S. Solar Market Insight, Q3 2016 14, *available at* http://www.seia.org/sites/default/files/resources/US%20Solar%20Market%20Insight%20-%20Q3%202016%20-%20Executive%20Summary%20-%20Final.pdf.

[7] GTM Research, U.S. Residential Solar Financing, 2015-2020 (July 2015), *available at* https://www.greentechmedia.com/research/report/us-residential-solar-financing-2015-2020.

[8] FRB: Report to the Congress on Credit Scoring and Its Effects on the Availability and Affordability of Credit, (Aug. 2007) *at* http://www.federalreserve.gov/boarddocs/rptcongress/creditscore/performance_tables.htm#table15a.

other factors.[9] Moreover, 52 percent of residents nationwide live in multi-unit buildings or homes with shared roofs.[10] These issues are particularly pronounced for low-income households, which are more likely to live in multifamily housing, have unsuitable roofs or rent their homes.[11] For low-income renters, the challenge of going solar is punctuated because they cannot make the choice to do so on-site. Low-income customers who do own their homes are more likely to live in older homes that need repairs and upgrades, which often takes priority over energy choices.[12] Community solar is an ideal solution to these barriers. One of the primary purposes of a community solar program is to expand access to solar beyond those that can, financially and physically, put solar on their properties. Community solar creates a unique opportunity for low-income customers by its very nature: Community solar makes solar's benefits available to consumers who may not own their homes, live in multi-family housing, or whose homes may not be physically fit to support solar.

- **Educational and Outreach Barriers, and Market Forces.** A report on Colorado's community solar program and its requirement for service for low-income communities outlines some of the outreach, educational, and market barriers that contribute to the challenges facing solar companies who wish to serve low-income customers. In Colorado, the effort to reach and market to low-income customers, handle extra paperwork in verifying customer eligibility, and program compliance added extra time and costs for developers.[13] Just some of the barriers include:
    - Customer distrust
    - Privacy concerns
    - "Nothing is free" mentality
    - Lots of paperwork
    - Environmental benefits do not always resonate
    - Multilingual and multicultural households
    - High mobility of low-income residents[14]

A well designed utility community solar program can include mechanisms for overcoming these barriers. Vote Solar recommends that a program include direction and funding for the utility to work with community organizations, so that trusted members of the community can help educate customers about the benefits of participating in a community solar program.

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[9] *See* NREL, Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment 3 (Jan. 2016), *available at* http://www.nrel.gov/docs/fy16osti/65298.pdf.
[10] National Multifamily Housing Council, Quick Facts, *at* http://www.nmhc.org/Content.aspx?id=4708.
[11] Id.
[12] *See* Ernie Hood, Dwelling Disparities: How Poor Housing Leads to Poor Health, Environmental Health Perspectives (May 2005), *available at* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1257572/.
[13] Lotus Engineering and Sustainability LLC, Analysis of the Fulfillment of the Low-Income Carve-Out for Community Solar Subscriber Organizations 19 (Nov. 2015) *at* https://www.colorado.gov/pacific/sites/default/files/atoms/files/Low-Income%20Community%20Solar%20Report-CEO.pdf.
[14] Id.

### *(2) Group Purchase of Distributed Solar Generation*

In response to the comments of Commissioner Jones seeking ideas for bringing the rate reduction and stabilization benefits of solar resources to those on fixed incomes, and in particular the thoughts about the utility acting as a facilitator for a group purchase of solar for many of its customers, Vote Solar offers the following comments.

The concept of group purchasing of rooftop solar systems has been around for a few years and is an attractive means of reducing soft costs. Numerous academic investigations show that non-hardware "soft-costs" represent the most significant opportunity for continued solar price reduction. According to a study by LBNL, customer acquisition costs are $0.62/W higher in the U.S. than for comparable projects in Germany – about the same as the cost of modules. A group purchase tackles the challenge of solar soft costs head on, effectively lowering customer acquisition costs and reducing complexity for program participants.

Facilitation of group purchases is usually funded by a small one-time administrative fee (for example, $0.20 cents per installed watt) paid by the selected contractor directly to the facilitator. This fee helps make the program self-sustaining with no additional cost to the homeowner.

How it works: The facilitator, in this example the incumbent utility, pools the buying power of its customers to reduce the cost and complexity of their individual solar purchases. Allowing the solar industry to serve a self-selected aggregated group of customers concurrently lowers customer acquisition costs, and results in lower pricing and attractive terms for participants.

Programs we have seen focus on an organization's (or a city's or town's) constituents or membership and utilizes the existing communication network (i.e. company emails, newsletters) to connect with participants, but we see no reason why the utility could not play this role.

From the utility's perspective, facilitating a group solar purchase program is a benefit to customers that demonstrates corporate social responsibility goals. For program participants, a utility-sponsored group solar purchase program helps them understand the solar value proposition and manage the group purchase process. The utility would issue the Requests for Proposals to solicit competitive bids from the solar industry and then works with a stakeholder-led evaluation committee, made up of representatives from the participating customers, to score proposals based on a suite of criteria. The utility or other designated entity can act as technical advisor to the committee during the proposal review process but does not play a role in the selection of the winning bidder. This unbiased role in the purchasing process helps the utility maintain its credibility with customers and the solar industry.

A case study of a group purchase program that focused on commercial projects in Alameda County California provides a specific example of this model is attached. If the Commission is interested, Vote Solar would be happy to bring a speaker to New Mexico to present and discuss the group purchase concept.

### *(3) Distribution Resource Planning (DRP)*

There was limited discussion of DRP at the workshop, yet it can be an important step towards capturing the benefits to the grid of many forms of distributed energy resources (DER). Thus, we here provide some background information on DRP and encourage the Commission to further explore this type of planning at the appropriate time.

The rapid deployment of DG and the anticipated proliferation of additional DER are transforming the power system. DER—including DG, energy efficiency, energy storage, demand response, and advanced inverters—increasingly offer a cost-competitive alternative to transmission-dependent generation. And modernizing the grid with DER delivers additional benefits, including greater system efficiency, increased reliability, and a cost- effective pathway to meet state environmental goals. Yet, few electric utilities are actively planning for the rise of DER.[15]

Resources:
California DRP process description: http://www.utilitydive.com/news/how-californias-biggest-utilities-plan-to-integrate-distributed-resources/401805/

Powerpoint presentation of Paul DeMartini on behalf of Newport Consulting and the Caltech Resnick Sustainability Institute:[16]
http://energy.gov/sites/prod/files/2015/04/f21/05-Mar2015EAC-GridMod-DeMartini.pdf

### *(4) DER: microgrids*

The recently released Distributed Energy Resources Rate Design and Compensation manual prepared by the NARUC Staff Subcommittee on Rate Design includes microgrids in its definition of DER. It goes on to define and describe microgrids as follows:[17]

> Microgrids are localized grids that can disconnect from the traditional grid to operate independently. Microgrids can strengthen grid resilience and help mitigate grid disturbances because of their ability to continue operating while the main

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[15] http://www.clean-coalition.org/site/wp-content/uploads/2014/02/DRP-Overview-09_jb-29-Sept-2015.pdf
[16] This report was appended to the California PUC's DRP Order, and used in part in the recent DER Manual developed by the NARUC Staff Subcommittee on Rate Design.
[17] NARUC DER Manual, page 48.

electric grid is down, thereby functioning as a grid resource for faster system response and recovery.

Microgrids help with the integration of growing deployments of renewable sources of energy such as solar and wind and other DER such as CHP, energy storage, and DR. By using local sources of energy to serve local loads, there is a reduction of energy losses in transmission and distribution, which further increases the efficiency of the grid.

According to the Microgrid Institute, microgrid projects are driven by factors that can be very different from one deployment to another.[18] Key drivers include:

- Need for electrification in remote locations and developing countries;
- Customer need for more reliable, resilient, and sustainable service;
- Grid security and survivability concerns;
- Utility need for grid optimization, investment deferral, congestion relief and ancillary services;
- Demand for lower cost energy supplies that are locally available (especially at remote sites, such as islands, military or mineral/resource installations, and isolated communities relying on high-polluting fuels); and
- Environmental, efficiency, and renewable energy benefits.

Given the workshop presentation and discussion addressing the Holloman AFB project, Vote Solar recommends the Commission include microgrids as a potentially beneficial future DER.

***(5) Addressing the proverbial duck curve***

There was brief discussion of increased afternoon/evening ramping requirements related to the effects of high penetration levels of solar resources. It is important to keep in mind that we are currently in an era in which the cost of solar generation has declined significantly, allowing growing adoption by retail electricity customers. Other DER technologies, including demand response, storage, and advanced inverters are in various stages of cost-effectiveness independently and when integrated with DG can mitigate some of these afternoon ramping concerns.

In addition, the Regulatory Assistance Project (RAP) has issued two publications that address these ramping issues with demand response and other techniques.

Jim Lazar, Teaching the Duck to Fly, January 2014: http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-teachingducktofly-2014-jan.pdf

[18] http://www.microgridinstitute.org/about-microgrids.html

Jim Lazar, Teaching the Duck to Fly, Second Edition, February 2016: http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-teachingtheduck2-2016-feb-2.pdf

Vote Solar appreciates the opportunity to present these initial comments for the Commission's consideration. As noted above, Vote Solar would be happy to arrange for presentations to the Commission on either or both of the concepts embodying low income customers and group purchase programs.

Respectfully submitted this 15th day of December, 2016.

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