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Live Local, Renew Local: Community Sourced Solar Energy in New Mexico

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For submission to the New Mexico House of Representatives Energy, Environment & Natural Resources committee, with potential sponsor Representative Melanie Stansbury (28-D).

Introduction

The shift to clean and renewable energy dominates the conversation when evaluating steps New Mexico can take towards reducing its climate impact, protecting the health of its lands, and improving the lives and wellbeing of its residents. In 2017, New Mexico accounted for nearly 4% of U.S. natural gas production and 2% of its coal production, but of the 2,805 trillion BTU (British Thermal Units) produced annually by New Mexican gas, coal, and oil, an average of only 683 trillion BTU is consumed by the state (U.S. EIA 2019). This fact supports the reality that New Mexico has not only been exploited to fuel American affluence, but has also become unsustainably dependent on extractives revenue in the process.

Currently New Mexico sources its electricity from three investor-owned utility companies, of which PNM is the largest. All other New Mexicans with electric access receive it through one of sixteen rural electric co-ops within the state (State Utility Program 2017).

PNM, in line with persistent community requests and the New Mexico Energy Transition Act (ETA), has vowed to transition to 100% emission free electricity production by 2045 (Energy Sources 2017). Today, they have already invested in enough solar, wind, and geothermal energy to power more than 147,000 homes in New Mexico (About PNM 2017).

Overview

Community Sourced Solar Energy (CSSE) will act as a supplement to the Energy Transition Act (ETA), moving New Mexico towards carbon free energy production by creating an energy democracy where both rural and urban New Mexican residents will have affordable access to decision making over their energy future via direct investments in renewable energy.

CSSE offers customers, primarily individual households but public entities (schools, hospitals, etc.) and businesses as well, the ability to offset their energy utility bill by helping fund local offsite (utility or investor-backed) solar arrays through a subscription based virtual net metering system. By offering subscription-based access to solar energy, customers retain the ability to easily back out of their financial commitment while ensuring no loss on investments; in addition, subscription-based models increase home value and can easily be passed on to the next owner or transferred to a new home with the relocating family. Arrays are built off-site, in mid-sized gardens, on community building roofs, or in the case of larger subscription groups, in larger solar power plants. Virtual net metering enables customers to share electricity from a single off-site power project, in contrast to net metering, which focuses on individuals generating their own onsite renewable electricity and thus reducing their electric bill. If the power project is owned by the customers, electricity output is in proportion to ownership.

In regard to the structure of a subscription oriented solar energy program, this proposal recommends three successful programs employed by cities across the globe today. These options would not only offer accessibility to renewably sourced solar energy for communities of all socio-economic backgrounds in New Mexico, something that has not previously been available,

but would also stimulate New Mexico's green energy economy. These structures include Discount Over Utility Rate, Flat Monthly Fee, and Lease to Own (EnergySage). Potential solar community members can choose which subscription model best suits their needs and desires.

Community investment in solar farms remotely or in the community itself will depend on which works best for their physical environment, and will be decided by the developer or utility, based on community input, or, if owned by individuals, the group of subscribers. Size of community base, geographic location, and socioeconomic status would all influence these decisions, because of this, CSSE will not have a universal, government mandated approach to how individual community solar programs will be built.

20% of energy in New Mexico is currently sourced from renewable resources. Under the ETA, all energy purchased and produced in state must be carbon-free by 2045, with goals to reach 50% carbon-free by 2030, and 80% by 2040. CSSE's solar focus will expedite this transition for residential and commercial energy use, with a goal of 25% renewable via solar met by 2030 and 50% by 2040. Rural electric co-ops, under the 2004 plan, were obligated to meet 10% renewable by 2020 and have surpassed this to 25% (NMPRC 2019; NMRECA 2019). Under CSSE, this will rise to 30% by 2030 and reach 50% by 2045, considering any required infrastructure construction. There is potential for community solar to be expanded further, however CSSE focuses on this initial rollout and infrastructure buildup.

Analysis

Preceding Legislation: Minnesota Case Study, New Mexico HB 210, Energy Transition Act

Community solar programs and legislation exist in many municipalities across the United States (NREL 2010). More than a third are in Minnesota, where there are over 200 active community solar projects and more being built (Vote Solar et al 2019). As such, Minnesota is an effective case study. 2013 solar legislation ordered its largest utility, Xcel Energy, to put a community solar program in place, with other utilities encouraged to submit plans (Research Department... 2013; Vote Solar et al 2019). Minnesota has no requirement for a yearly or per utility cap on the development of community solar energy, allowing programs to grow exponentially since operations began in 2016, with MN's community solar program hitting 633 megawatts of operational capacity in November of 2019, servicing residential customers, businesses, and public entities like schools and hospitals (Farrell 2019). The success of the program is in part due to its reliance on remote arrays with virtual net metering, a core component of CSSE (Farrell 2018).

CSSE is the second proposed community solar program in New Mexico. In the 2019 legislative session, the New Mexico Legislature tabled the Community Solar Act (HB 210 2019). While components of House Bill 210 will be incorporated into CSSE, namely flexible ownership structure and a lack of a facility cap, CSSE will improve and expand on certain areas such as consideration of affordable and equitable service.

Flexible ownership of community solar gardens will allow financing by utilities, utility affiliates, and independent developers. Flexible ownership furthers CSSE's goal of energy democracy and energy freedom: New Mexicans will be able to directly invest in renewable energy as independent developers, and thus contribute to economic growth as small business owners. This collaborative approach is an improvement on HB 210, which faced concerns from PNM that it would not be involved and would lose all business (Miller 2019).

HB 210, like Minnesota, placed no limits on the number or total generating capacity of community solar facilities, which CSSE will also incorporate. Limiting array size would prevent

growing with demand, running counter to CSSE's complementary role to the ETA. To meet CSSE's stated goals, growth in the residential solar and commercial sector cannot be restrained.

An important focus of CSSE is accessibility. HB 210's unamended language regarding this primarily focuses on encouraging accessibility and discounted service (HB 210 2019). Accessibility is key to a renewable and sustainable future in New Mexico. In 2017, 19.7% of New Mexicans lived below the poverty level with poverty rates higher in rural populations (22.6% of New Mexicans) (Moskowitz 2019). CSSE will better consider affordable and equitable service to low-income and rural communities, focusing on overcoming financial and logistic challenges via methods such as partnerships with utilities, community involvement, and encouraging local arrays (Low-Income Solar Policy Guide 2018; IREC 2017; Heeter et al 2018).

Concrete community solar legislation is needed in New Mexico, and will positively impact the state's economy, environment, and communities. CSSE will bring new skilled jobs to New Mexico: solar photovoltaic installers were the fastest growing occupation nationwide in 2018, with employment expected to grow 63% by 2028 (Bureau of Labor Statistics 2018). Switching to renewables will reduce monthly energy expenses for consumers due to the lower cost over time of renewable energy: switching to renewables ensures avoidance of future cost increases of fossil fuels (NREL 2010). For businesses and public institutions, this could lead to thousands of dollars saved per year. The ETA requires full clean energy by 2045 and thus infrastructure buildup is already expected and CSSE does not need to substantially add to this cost. Arrays will be paid for by utilities, developers, or ownership models.

New Mexico is particularly vulnerable to climate change and is already experiencing the negative impacts of warming and unsustainable development through polluted land, water, and air. Robust, widespread community solar will play a key role in aiding New Mexico's climate resiliency, contributing to a cleaner environment and reducing fossil fuel dependency. According to the New Mexico Interagency Climate Change Task Force's initial report, in 2018 18% of New Mexico's greenhouse gas emissions, or around 12 million metric tons, were produced in the electricity sector (2019). Transitioning this sector to solar by 50% will prevent 6 MMT of emissions. Carbon emissions are known pollutants with negative health and environmental impacts and are known to directly cause warming. Additionally, fossil fuels not only produce carbon dioxide when burned for energy, but also create dangers to health and the environment. In a social climate increasingly concerned with the effects of climate change, community solar is uniquely poised to involve everyday citizens with their energy future.

In response to the recognition of climate change's impact on New Mexico, the 2019 ETA marks the state's commitment to transition its electricity grid to fully carbon-free energy by 2045 while also "preventing carbon dioxide emitting electricity-generating resources from being reassigned, redesignated or sold (to out of state customers) as a means of complying with the standard" (SB 489 2019). Additionally, the ETA promises to assist utilities in their equitable and just transition away from coal-powered electricity to clean, affordable, and carbon-free electricity; its assistance will come from its provision of more than \$40m that will be used to help with plant decommissioning, reclamation jobs for plant employees and mineworkers, and additional severance pay and job training for other workers (Nájera 2019).

Economics and Financing

The option to finance private renewable infrastructure is still not accessible for all New Mexicans. By partnering with PNM, a subscription-based approach to this existing solar potential will allow more New Mexicans to use solar energy. Subscription funds will serve as

CSSE's main source of funding and further PNM's ability to expedite array construction, aligning growth with demand and maintaining the timeline. The suggested models are as follows:

The first option is a Discount Over Utility rate. Members will have their discounted pay rate of solar attached to a utility electricity tariff rate, so electricity bills will fluctuate as normal while New Mexico is in transition to 100% renewable energy. Even after transition, utility fluctuation will happen as the rate of solar does (APT, Inc). The second option is a Flat Monthly Fee, wherein the rate and production of solar billed to each subscriber is a set rate every month and solar credits will be applied to the member's utility bill, reducing monthly bills as utility rates rise. The third suggested option is Lease to Own: each member's household will pay a flat rate each month. Depending on their rate and length of investment, they will eventually "own" the solar credits and no longer pay the monthly rate.

Other funding avenues include: at least 7% of New Mexico's Oil and Gas Industry revenue allocated to the General Fund budget categories of Health and Human Services and Agriculture, Energy, Natural Resources should be used to fund initial rollout. In 2018, almost \$79.8 million were diverted from Oil and Gas revenue to these categories alone (New Mexico Oil & Gas Association). Externally, CSSE guidelines allow private investors to build arrays and sell that energy to PNM to sell to households. Invested infrastructure in these terms will also add to the amount of solar energy being produced state-wide, furthering the feasibility of CSSE's proposed renewable energy usage goals.

RECs are currently sunsetting in 2020; however, CSSE will continue the program. PNM has an existing comprehensive REC framework for multiple sizes of facilities as well as different structures of ownership, with 2017 prices listed (Public Service Company of New Mexico 2017). RECs, in these terms, will serve as an added incentive for consumer solar subscription, especially to those who have less-immediate access to solar energy infrastructure. To further incentivize the subscription model, subscribers will be provided a username that they can use when recommending to others to redeem a 20% discount on their next electric bill. Each newly referred member will receive a 10% discount on their next electric bill when using an existing member's username. Other potential incentives for photovoltaics include the following: tax credits, accelerated depreciation, cash rebates and buy-downs, performance-based incentives, feed-in tariffs, and tax abatements (Solar Energy International 445). These have proved useful and seen success in other community solar programs across the United States.

Measurements of Success

The economic potential within renewable energy is immense and New Mexico has the opportunity to keep up with national solar industry growth. Along with the promise of this potential, as well as our stated timeline of renewable energy use goals, CSSE will measure success by state capital growth, job growth, and whether its goals are met.

In comparison to the current \$1.80 billion of investments in renewable energy production in New Mexico, the NRDC projects new investments to reach near \$4.6 billion in the state by 2030, the same year as CSSE's own goal of 25% resident renewable energy use (SEIA 2019; Long & Krishnaswami 2019). CSSE will find satisfaction in such capital production, but the main success factors will lay within jobs created for New Mexicans, as well as in reaching the proposed renewable energy use goals. The Bureau of Labor Statistics projects nationwide job growth in solar installation to grow 63% from 2018 to 2028 (Bureau of Labor Statistics 2019). For job growth in New Mexico itself, CSSE will strive to see numbers reach 7,100 in new solar

jobs by 2030, in comparison to the current 2,520 jobs in the state (Long & Levin 2018). This projected job growth will also reflect positions within rural and low-income communities.

In regards to energy production, the biggest producer of carbon pollution in New Mexico is the PNM-owned coal-fired San Juan Generating Station and located in the four corners area of New Mexico (Nájera 2019). In response to the ETA and motivated by decreasing renewable prices, PNM has committed to fully retiring the plant by 2022 (Nájera 2019). Through this, PNM is expected to reduce carbon emissions by 12 million tons a year (Nájera 2019).

According to NRDC research, by 2030 the ETA will help New Mexico achieve a 40% annual reduction of carbon emissions produced by power plants, a number not otherwise expected to drop with increased energy demand brought on by projected population growth (Long & Levin 2018). Reducing carbon emissions will also reduce air contaminants such as nitrogen oxides and sulfur dioxides which directly influence air quality induced health effects and ER visits for New Mexicans (Long & Levin 2018).

In regards to CSSE, power over energy decisions, allocated to the public themselves, and access to an energy democracy, demands that these communities recognize that their actions and decisions have an effect on state emission rates, leaving them responsible to help assist PNM and other public utility companies with the reduction of state emission rates.

Potential Challenges

Rural and low-income communities face many potential obstacles to accessing solar energy. In response, making solar energy accessible to all New Mexicans regardless of socio-economic status is a primary mission of CSSE under energy democracy, the backbone of this policy. This proposal recognizes the issue of higher rural and low-income infrastructure expenses due to necessary localized solar installations. A goal of at least 25% participation from low-income households has been set within CSSE, with utility-owned programs required to allocate part of their array to servicing low-income communities. Energy efficient housing renovations will be included in this program as well, and on-bill financing will be implemented in order to accomplish this (Low-Income Solar Policy Guide 2017). Low-income households will see their solar credits billed at full retail price and to help mitigate any delay between subscription start and savings seen, no upfront costs will be added to these households' bill.

In the Minnesota case study referenced earlier, the financial struggles of low-income and rural communities were alleviated through allocating funds for community solar arrays to be built within the community itself (Vote Solar et al 2019). By building solar arrays locally on community buildings such as schools, community centers, etc., the community directly benefits without having to deal with transferring power from offsite; this also gives communities more power to make energy decisions that best suit their own unique needs (Farrell 2010).

New Mexico has sixteen different rural electricity co-ops who get energy from two major energy providers. This local solar infrastructure will serve especially useful in the "mix" of energy used by co-ops, who are already providing "more than 25 percent of their energy from solar, wind and hydro" (NMRECA). Regarding infrastructure funding, external low-rate loan programs available to low-income and rural communities such as the USDA Rural Utilities Service's Energy Efficiency and Conservation Loan Program can be used to fund both on and off-grid renewable systems (Appalachian Voices 2017).

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