

State of New Mexico's LMI Solar Strategy: 2018

New Mexico's Energy Minerals and Natural Resources Department's Energy Conservation and Management Division (ECMD) developed an Energy Roadmap that defines a direction and sequence of strategies required to strengthen and diversify a New Mexico energy economy resilient to global changes. ECMD assembled a steering committee of over 50 energy stakeholders representing energy producers, large energy users, regulators, transportation interests, local and regional governments and energy advocates. The group developed the [New Mexico Energy Roadmap](#), released in January 2018.

Among the roadmap's goals and strategies are ones especially relevant to the LMI solar strategy, including Goal 4: Pursue emerging energy technologies through research, demonstration, development and deployment. To meet this goal are three relevant strategies:

- Strategy 4.b: Expand the development and sale of energy-related value-added products;
- Strategy 4.e: Identify the top three barriers limiting the profitability of clean energy enterprises; and
- Strategy 4.f: Consider options for smart siting of clean and renewable energy and storage installations.



Background information

New Mexico's 10% solar tax credit, which expired in June 2016, did not serve households with limited tax liability. The State waives the gross receipts (sales) tax on solar system installations, and residential solar energy systems are exempt from increased property tax assessments. The state's Solar Rights Act protects property owners' solar rights, so that neighbors cannot grow tall trees or build anything that blocks solar panels. New Mexico's renewable portfolio standard has a 4% solar goal by 2020 with a carve-out for distributed generation. And a 2017 law strengthens consumer protection with respect to solar sales.

One of every six New Mexicans lives in manufactured housing, also known as trailers, mobile homes, single- or double-wides, or modular homes. The 156,000 mobile homes are located throughout the state, in both cities and rural areas. In the Espanola Valley twenty miles north of Santa Fe, two in five homes are manufactured. Many manufactured homes are within New Mexico's 357 trailer parks¹; others are scattered on private properties and tribal lands. There is even a subdivision in Albuquerque's Northeast Heights, home to many high-income addresses, that consists of over 400 manufactured homes. Others are sited near high end addresses in Santa Fe and Taos, providing workforce housing in places with few affordable housing options.

Three out of every four New Mexican families earn under \$48,000 in annual income. The state's Native American communities – 19 pueblos, two Apache tribes, and 52 chapters of the Navajo Nation – have the nation's highest poverty rate. The Navajo Nation's 43% poverty rate, 15% in extreme poverty, is 3.4 times higher than the national average and over double that of New Mexico's, according to the Census Bureau. Given the cost and complexity of building homes on tribal owned lands, where the land is held in trust for the tribes, most new homes on tribal lands are manufactured.

There are 32 public housing authorities in New Mexico that own approximately 8,000 units and that provide housing vouchers to approximately 10,000 low income residents. Public housing authorities in Sunland Park, Santa Fe and Bernalillo have already installed solar at public housing sites; others would like to include solar in existing public housing sites but are hampered by individual metering or poor quality roofs.

There is great potential to install more solar at the homes of the poor. New Mexico is America's second sunniest state, but for most families who have low to moderate incomes, solar is simply unaffordable.

ECMD has responded to this acute need and great potential by designing "PV on a Pole™," a pole-mounted solar array that lowers installation costs, conforms to constraints of manufactured housing roof strength and service entrance sizing, and sports a small ground footprint. PV on a Pole consists of a pole screw-mounted into the ground. Atop the pole are four PV panels and a tracker to enable the panels to follow the sun throughout the day. PV on a Pole is standardized and is intended to be mass-

¹ "Manufactured and Mobile Home Communities in New Mexico." MH Village <https://www.mhvillage.com/Communities/MobileHomeParksState.php?state=NM>

produced, rather than the costly individually designed and installed arrangement now in the marketplace. This provides a significant growth path for solar power from this type of system and meets many homes' energy needs without requiring a custom design.

Relevant solar policies and issues

The State has had a very popular but recently expired solar tax credit program, giving a 10% credit up to \$9,000. According to the State Taxation & Revenue Department, the average income of New Mexicans taking the state solar tax credit is \$176,000. Among the 6,599 solar systems installed between 2007 and 2015², the portion taken by low to moderate income families, who often do not have a tax liability, is small.

ECMD just finished an energy road map for the State, a DOE-funded effort to implement the state energy plan; it calls for "public-private-partnerships for building energy efficient commercial buildings and low income multi-family housing." One could make the case for trailer parks to be considered as multi-family housing, and they certainly provide housing for low and moderate income families that could benefit from energy upgrades, including solar.

Financial resources

Lending programs that currently offer solar financing in New Mexico include the Nusenda Credit Union solar loan program, which offers 3.699% for credit union members with a FICO score above 760; if below 700 one can buy down the amount or get a home equity line of credit. Another program is offered through Homewise, the Santa Fe-based affordable housing non-profit, which offers solar loans to limited income households at 6% financing over 30 years. To date a relative handful of LMI households have been served by these financing programs, in part due to their newness but also because most low- or moderate-income residents do not qualify for loans or their credit resources are fully subscribed. Loans for home purchases could be extended to cover the addition of solar energy.

Power purchase agreements, or PPAs, have been used by tribes and local governments to cover up-front costs of solar. Picuris Pueblo, the state's smallest Native American community, was able to install and own a one-megawatt solar array at no up-front cost to the pueblo, selling the power to Kit Carson Rural Electric Coop through a 20-year power purchase agreement that gives pueblo members an annual dividend during the life of the PPA.

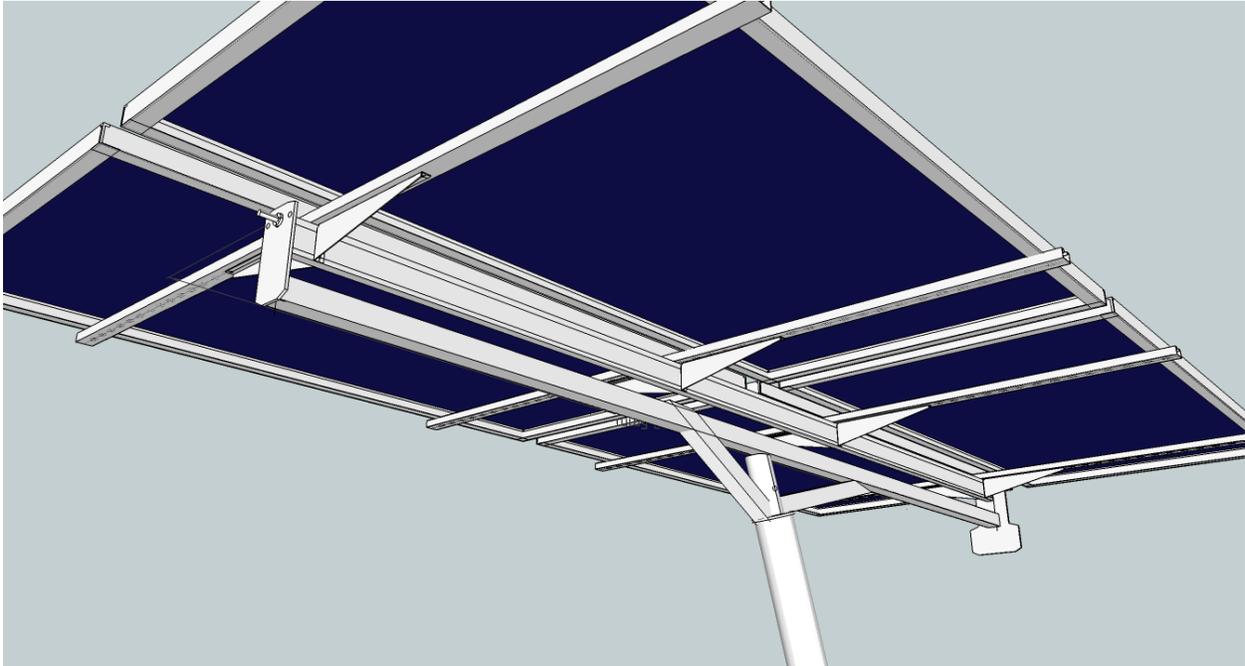
On bill financing, offered to members of a utility or those living in a political jurisdiction to pay for up-front costs of energy efficiency or solar, is currently only offered in New Mexico by one rural electric coop for ground source heat pumps.

Grants from foundations and non-profits such as Cornerstones and government programs such as low-income heating assistance, weatherization or loan and grant

² "Analysis of PV Adopter Demographic Trends", Lawrence Berkeley Labs, November 2017

programs can play a vital role to both back new programs and offer support to those who would otherwise never qualify for a loan.

Another financing option is a special tariff that would assessed those who would like to go solar. Currently, costs associated with utility-based energy efficiency programs are assessed to all customers, leaving it open to resentment by those who do not take advantage of the program, which is another advantage of a user-only tariff approach that is akin to an on-bill repayment program.



Plan and Strategies

There are many components to New Mexico's LMI solar strategy that need to fall into place so that the pole mounted solar approach can reach its full potential. Chief among them are technical product development; project management; utility, municipal, tribal and mobile home buy-in; manufacturing and other business arrangements; consumer financing, and customer outreach.

On technical development, Mark Gaiser of the ECMD staff is taking his design and, with certified staff and instructors, building, installing and monitoring solar-on-a-pole prototypes at Santa Fe Community College and Northern NM College in Espanola. Once prototypes are up and generating electricity, we can document solar output and utility bill savings data. A wide range of stakeholders, from elected officials to trailer park residents, will be invited by ECMD's Ken Hughes to come to either college to examine the array installation. Hughes will circle back to the rural electric coops, municipalities, tribes and mobile home partners to elicit support to offer arrays to their

members and customers. Gaiser will also generate solar system specifications as an open source document and get at least ten people or institutions to buy and make the next batch of panels for their own homes, a version 2.0 if you will. Then, based on their experiences, ECMD will work with a for-profit and/or non-profit business or tribal enterprise to ramp up production in batches of approximately 100 arrays. Project results will be shared with CESA's partner states and other interested parties in the hopes that manufactured home residents beyond New Mexico's borders can benefit from this project. Over time, the success of "PV on a Pole™" will depend less on ECMD's role and more on those who step up to make, market and finance the product.

Strategy #1

Title: Utility Partnership

Description: collaborate with rural electric cooperatives and municipal utilities

Qualitative and quantitative targets: 2 MW of solar installed or under development by the end of 2019 in the service territories of the rural cooperatives in Northern New Mexico and the City of Truth or Consequences municipal utility; 26 MW over the life of the program as it gets expanded to other utilities.

Brief workplan: Obtain utility agreements to install solar arrays for their mobile home customers, finance a pilot installation of ten arrays, set up an on-bill financing program for utility customers, and/or offer to install solar arrays and pay customer a monthly fee while retaining ownership.

Timeline: Workplan to commence upon completion of prototype installation and monitoring, Spring 2018 and continue into 2019. Specifically, obtain utility agreements by July 2018 to install solar arrays, finance a pilot installation of ten arrays by August 2018, set up an on-bill financing program for utility customers by October 2018, and offer to install solar arrays by February 2019.

Financial and human resources required: ECMD (with SES grant funds contributing to staff salaries) and utility staff.

Sources of funding: bank, credit union, equity capital firm, US Department of Agriculture.

Strategy #2

Title: Local Government Partnership

Description: collaborate with municipalities, counties and their housing authorities.

Qualitative and quantitative targets: 2 local housing authorities installing solar to serve its LMI members and 2 local governments buying or setting up an on-bill repayment program to underwrite 20 pole mounted solar arrays to serve 20 LMI families.

Brief workplan: Obtain resolutions of support from local governments and obtain agreements to finance ten arrays/government; insert funding into FY2019 budgets;

arrange for construction or ordering of solar arrays; and set up on bill repayment program.

Timeline: Workplan to commence in July 2018 with introduction of resolutions and continue through 2019. Specifically: obtain resolutions by July 2018, obtain financing agreements by October 2018, insert funding into budgets by March 2019, and set up on bill repayment program by June 2019.

Financial and human resources required: ECMD, city, county and housing authority staff.

Sources of funding: HUD, local government housing funds, third party intermediary, local government bond, development fees.

Strategy #3

Title: Tribal Partnership

Description: Enable greater levels of tribal access to solar, either community, pole or microgrid-based.

Qualitative and quantitative targets: six tribes and pueblos installing solar that serve their LMI members.

Brief workplan: Plan and conduct a tribal energy sovereignty meeting to coordinate responses to DOE and other funding opportunities for tribal solar and microgrid projects, explore manufacture of solar pole arrays at tribal facilities, display the solar pole array at tribal events, and conduct engineering analyses of proposed tribal solar projects.

Timeline: Workplan commenced on January 8, 2018 at the tribal energy sovereignty meeting. Explore making arrays at tribal facilities by July 2018, display solar pole by August 2018, and conduct engineering analysis by December 2018.

Financial and human resources required: tribal housing authorities, tribal liaisons at DOE's national labs.

Sources of funding: DOE, HUD, foundations, bank, credit union, USDA, Bureau of Indian Affairs.

Strategy #4

Title: Partnerships with Mobile Home Dealers and Mobile Home Parks

Description: Enable buyers and residents of manufactured homes to buy and install pole mounted solar arrays.

Qualitative and quantitative targets: four mobile home dealers agree to sell pole mounted solar arrays to their customers, and four mobile home parks agree to allow residents to install pole mounted solar arrays.

Brief workplan: Meet mobile home dealers and mobile home park managers to explain the advantages of selling or siting pole mounted solar arrays for manufactured housing residents; arrange agreements to sell or site.

Timeline: Workplan commenced in January 2018 with meetings at mobile home dealers. Meetings with mobile home dealers will continue through 2018. Subsequent meetings will be held in mobile home parks with residents, also through 2018.

Financial and human resources required: ECMD staff.

Sources of funding: loans offered by mobile home dealers that can roll solar into the loan, banks and credit unions.

Other next steps:

Seek out and arrange for a for-profit or non-profit entity to build and install solar arrays based upon specifications devised by ECMD.

Approach PosiGen to elicit interest in working in New Mexico.

Approach credit unions and foundations for fiscal underwriting.

Perform outreach and education to manufactured home residents, manufactured home dealers, tribes and pueblos, and public housing authorities.

Develop engineering stamped drawings for submission to local and state permitting authorities.

Install a prototype at Santa Fe Community College and a second prototype at the Espanola campus of Northern NM College. Provide an opportunity to receive feedback from students, professors and the community.

Display the mobile version at least four times in 2018, at mobile home parks, Pueblos and Navajo chapters and Apache sites, New Mexico State Fair, Earth Day events, City of Truth or Consequences, and Town of Taos.

Arrange for pole mounted array manufacturing; options include underused facilities at three northern Pueblos, Rocky Mountain Youth Corps' facility in Taos, welding shops, or a new spin off at Santa Fe Community College and/or Northern NM College.

Participate in marketing and outreach among partners.