BUREAU OF BUSINESS & ECONOMIC RESEARCH

# The Potential Economic Impact of Community Solar in New Mexico

Prepared for The Coalition for Community Solar Access

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# Executive Summary

Community Solar has the potential to contribute substantially to New Mexico's economy. Community solar projects provide an alternative to individual solar installations; consumers can buy-in to larger-scale solar facilities and receive credit on their electrical bills for their share of the power produced. This application of solar technology is ideal for individuals lacking space to install their own panels and for renters, who may not have the ability to convert their homes to renewable energy sources. Additionally, community solar installations can offer opportunities for larger businesses to purchase renewable energy, serving as an *anchor* customer, often helping to offset the cost to individual consumers. The State will need to consider how regulations will influence the impacts of community solar installations both on the local and statewide levels.

As a new application of renewable energy initiatives in New Mexico, community solar projects could create opportunities for workers affected by the closure of energy plants reliant on fossil fuels. In addition to the environmental benefits associated with renewable energy, these projects can potentially provide economic benefits through jobs creation and the expansion of fiscal revenues.

Community solar installations would bring both one-time and sustained revenues into the state. The impact analysis demonstrates that economic changes resulting from the construction and operations phases of the installation of a single 2 MW solar array in the state of New Mexico can potentially support 12 jobs, provide $463 thousand in labor income, and create $1.64 million in industrial output. Effects generated through the construction and operation of a 5 MW facility in the state suggest that a total of 38 jobs are created, with $1.47 million in labor income and $5.17 million in output.

Potentially, 25, 50, and 100 MW projects undertaken exclusively through 2 MW implementations in the state can create between 151 (for 25 MW) and 605 jobs (for 100 MW), a labor income between $5.8 million and $12.1 million and an industrial output ranging from $20.5 million to $81.9 million, depending on the desired output. Similar strategies to generate the same production, but completed through 5 MW implementations, can yield between 188 and 752 jobs, $7.3 million and $29.4 million in labor income, and $25.8 million and $103.4 million in output. These potential impacts are attained using linear scales and should only be considered rough estimations. These figures are the product of independent constructions/operations without any regard to potential economies of scale.

***Total Economic Impacts of 25, 50, and 100 MW Annual Power Generation through 2 MW Installations in the State of New Mexico***

| Megawatts | Employment | Labor Income | Output |
|---|---|---|---|
| **25** | 151 | $5,781,613 | $20,462,663 |
| **50** | 303 | $11,563,225 | $40,925,325 |
| **100** | 605 | $23,126,450 | $81,850,650 |

***Total Economic Impacts of 25, 50, and 100 MW Annual Power Generation through 5 MW Installations in the State of New Mexico***

| Megawatts | Employment | Labor Income | Output |
|---|---|---|---|
| **25** | 188 | $7,346,275 | $25,860,900 |
| **50** | 376 | $14,692,550 | $51,721,800 |
| **100** | 752 | $29,385,100 | $103,443,600 |

With a 50 MW statewide annual generation schedule, construction and initial operations phases of a series of 2 MW facilities could potentially create cumulative labor incomes ranging from $34.7 million for 3 years, and $57.8 million for 5 years. Output figures for the same run from $122.8 million to $204.6 million. Statewide impact estimates for strict 5 MW installations allow for labor income and output figures that are approximately 79% greater than those generated from 2 MW facilities. Cumulative 3- and 5- year labor incomes are roughly $44.1 million and $73.5 million, respectively. Industrial output dollars are estimated at $155.2 million for 3-year outlooks and $258.6 million for 5-years. Each of these values double when considering a 100 MW generation schedule.

***Statewide Cumulative Economic Impacts for 3- and 5-year Outlooks for 50 and 100 MW Annual Output through Additional 5 MW facilities***

| | Outlook | Employment | Labor Income | Output |
|---|---|---|---|---|
| **50 MW** | 3-year | 1,128 | $44,077,650 | $155,165,400 |
| | 5-year | 1,880 | $73,462,750 | $258,609,000 |
| **100 MW** | 3-year | 2,256 | $88,155,300 | $310,330,800 |
| | 5-year | 3,760 | $146,925,500 | $517,218,000 |

Results suggest that the average per county direct and indirect economic impacts of the operations phase for a single 2 MW facility support 0.5 jobs, $15.7 thousand in labor income, and $62.9 thousand in industrial output. After 20 years, assuming a new 2 MW plant constructed in a single county every year for five years and in operation 20 years, those numbers compound, reflecting effects from the operations phase of five 2 MW facilities: 40 jobs, $1.25 million in labor income and $5 million in output. Average impacts from the over-time operations of 5 MW installations begin at 1.5 jobs, almost $45 thousand in labor income, and $187 thousand in output at year one (with a single 5 MW plant). At year 20, five 5 MW facilities can support 117.8 in employment, nearly $3.6 million in labor income, and almost $15 million in industrial output.

Fiscally, results demonstrate the potential for generating roughly $46 thousand in tax revenues as a response to economic activity from the construction and operation of a 2 MW facility. The potential for $146 thousand in tax revenues exists at the 5 MW level. Expanding these fiscal effects to incorporate the impact estimates of 25, 50, and 100 MW capacities yields a range of $574 thousand to $2.3 million in tax revenues for a series of 2 MW projects and a range from $729 thousand to $2.9 million for projects exclusively employing 5 MW arrays.

Community solar projects provide lease dollars for fallow lands. Many renewable installations require open, unobstructed space to maximize energy production; however, as community solar installations are smaller in scale, their development could provide benefits to landowners who might be overlooked in larger utility projects. When developing policy regulating these projects, the State will need to consider the maximum size of an individual installation and whether or not to create a statewide cap on total operational capacity. These choices will affect the impacts described in this report and the economic viability of community solar on the whole.

The State will also need to consider not only where community solar installations may be built, but also who will be allowed to access the energy generated from those installations. In some states, customers may only purchase power from installations in their home county or in adjacent counties; these regulations influence the location of development and thereby have the possibility to increase economic impacts in some counties and to decrease impacts in others. Depending on the policies developed, some communities may see more opportunity and development than others. Specifically, if limitations were placed such that customers could only subscribe to projects located in their home county, community solar projects would concentrate around urban areas in Bernalillo, Dona Ana, Sandoval, and Santa Fe Counties, with some limited capacity possible in Otero and Valencia Counties.[1] However, cost and availability of land in these areas could further limit development. Again, careful consideration should be given to how the projects are distributed and where the energy is available for purchase.

This study was commissioned by the Coalition for Community Solar Access as a part of their work on a State-initiated working group reviewing the potential for community solar initiatives. The Bureau of Business and Economic Research's (BBER's) analysis was based on data gathered from experts in the field and independent, publicly sourced information.

[1] Potential development information provided by CCSA.

# Introduction

In 2019, Governor Michelle Lujan Grisham signed into law Senate Bill 489,[2] The Energy Transition Act, requiring New Mexico to utilize 50% renewable energy by 2030. It further requires the state to move into 100% carbon-free generation of electricity for investor-owned utilities by 2045, and for rural cooperatives by 2050. The Act not only sets renewable energy standards for the state, but also provides workforce training and assistance to communities that will be affected by the transition away from energy sources such as coal. This includes millions of state dollars earmarked to help communities impacted by the closure of the coal-fired San Juan Generating Station transition and a move to renewable power sources by 2022.Though the Energy Transition Act establishes a schedule of renewable energy standards, important questions regarding the ownership of facilities that will be used in the generation of renewable energy need to also be explored.

To review community solar initiatives, the New Mexico Legislature, through Senate Memorial 63, developed a working group with representatives from the Energy, Minerals, and Natural Resources Department; the Public Regulation Commission; utility companies; electric cooperatives; renewable energy industry representatives; the New Mexico Municipal League; various environmental organizations; Indian Nations, Tribes, and Pueblos; low-income service providers; and local governments, cities, and counties.[3]

One of the members of the working group, The Coalition for Community Solar Access (CCSA), commissioned the Bureau of Business and Economic Research (BBER) to investigate the potential economic and fiscal impacts of implementing community solar projects in New Mexico and to provide a general market snapshot of the areas currently served by New Mexico's top three utility services.

In the next section, we give a brief overview on the nature of solar power and what larger-scale solar power could look like in New Mexico.

[2] https://www.nmlegis.gov/Sessions/19%20Regular/bills/senate/SB0489.html
[3] 2020 Regular Session <https://www.nmlegis.gov/Sessions/20%20Regular/final/SM063.pdf>

# Background

Solar energy is a renewable resource that converts the energy from sunlight into electricity. Various technologies are available to access this energy including photovoltaic (PV) systems and concentrated solar systems. Small-scale, rooftop solar installations are one way in which a consumer can generate electricity for their home; however, not all consumers have the resources or the ability to utilize this application.

In 2019, the mayors of Albuquerque, Las Cruces, and Santa Fe wrote a guest column in the Albuquerque Journal supporting community solar efforts to bridge the gap between those who can currently access renewable power and those who cannot.[4] Although there is support for community solar legislation in New Mexico, such legislation has not come to fruition yet.

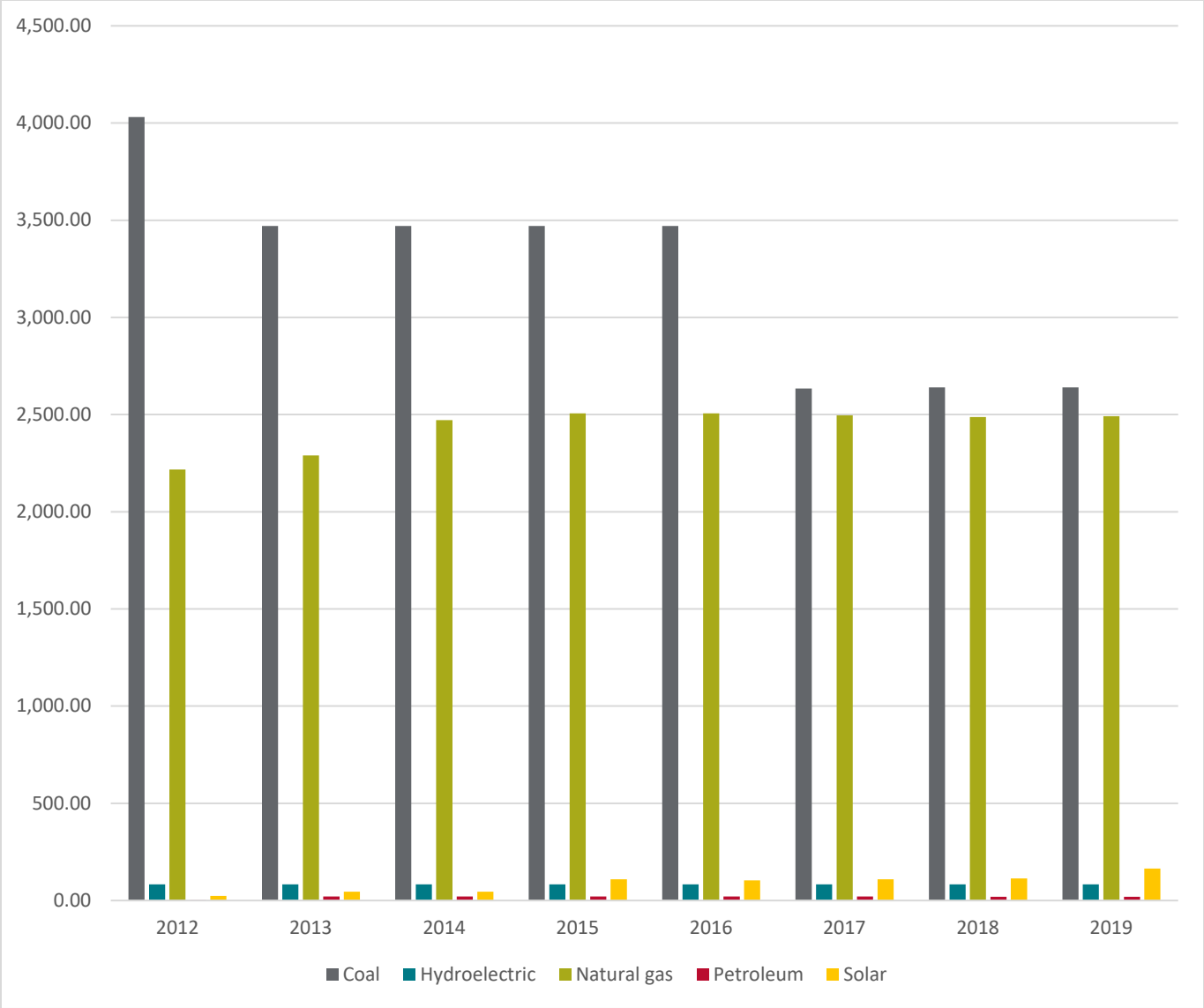
Community solar is an alternative to individual installations; consumers can buy-in to larger-scale solar facilities and receive credit on their electrical bills for their share of the power produced. This application of solar technology is ideal for homeowners lacking space to install their own panels and for renters, who may not have the ability to convert their homes to renewable energy sources. Additionally, community solar installations can offer opportunities to larger businesses to purchase renewable energy, serving as an "anchor" customer, often helping to offset the cost to individual consumers.

New Mexico sees approximately 300 days of sunshine annually, with a near-average of 3,700 annual hours of sunshine the southwest part of the state and 2,800 hours in the north-central regions.[5] As the second sunniest state in the nation, and a designation as one of the top three states with the best solar energy resources, New Mexico has a climate ideal for solar development.[6] However, the primary energy source used to generate electricity statewide for decades has been coal.

The total share of electricity generated by coal-fired power plants in New Mexico has declined steadily in the past 30 years and power generation by renewables and natural gas plants has risen. Although solar remains a small portion of New Mexico's electric utility generation, as is seen in Figure 1, it has seen marked increases in recent years, as illustrated in Figure 2.[7]

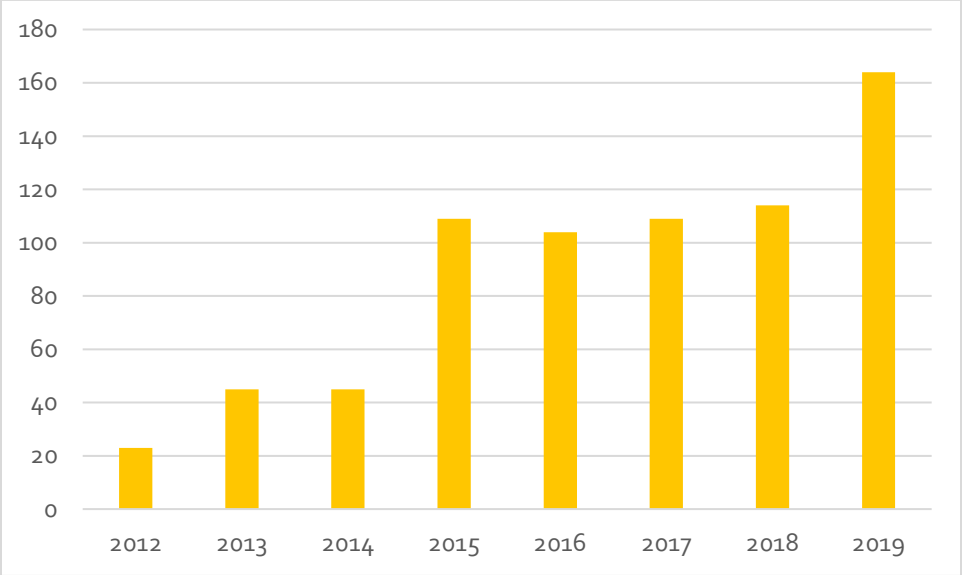
[4] Keller, Tim, Alan Webber, and Ken Miyagashima. (2019). "Community Solar Gives Power to the People." https://www.abqjournal.com/1282790/community-solar-gives-power-to-the-people.html
[5] NMSU. (2020). https://weather.nmsu.edu/climate/about/
[6] US Energy Information Administration. (2020). https://www.eia.gov/state/analysis.php?sid=NM
[7] These figures do not include combined heat-and-power plants, nor do they include power sold to out-of-state entities.

*Figure 1: New Mexico Electric Utility Power Capacity by Source (MW), 2012-2019*[8]




[8] US Energy Information Administration, Complete State Tables (https://www.eia.gov/electricity/state/newmexico/); Electricity provided by battery power was eliminated from the chart as the figures were negligible.

*Figure 2: New Mexico Solar Power Capacity (MW), 2012-2019*[8]




As New Mexico closes coal-fired power plants such as the San Juan Generation Station and develops capacity for renewables, it is essential to look at economic as well as environmental issues. In addition to the environmental benefits associated with renewable energy, community solar projects can potentially provide economic benefits through jobs creation and the expansion of fiscal revenues. As these projects are new, they can create further opportunities for displaced workers, given the right training and geographic development.

In the next section of the report, we discuss the potential economic and fiscal impacts of developing solar projects in the counties served by New Mexico's three largest electricity providers: The Public Service Company of New Mexico (PNM), Southwestern Public Service Company (SPS), and El Paso Electric Company (EPE).

# Economic and Fiscal Impacts

## Methodology

The economic effect of any community solar project on state and county economies is greater than the sum of expenditures. This occurs as funds are cycled through the economy. The following calculation is implemented to estimate the direct economic impacts:

*Direct Impact = (% Out-of-State Revenues)* ***X*** *(% In-State Expenditures)* ***X*** *(Total Expenditures)*

The above equation indicates that direct impacts are created by externally funded and locally spent dollars. IMPLAN, an input-output economic impact modeling software, is employed to estimate the indirect and induced impacts stemming from direct contributions. IMPLAN applies a variety of data sources to estimate economic impacts; the total economic impact is comprised of the sum of direct, indirect, and induced estimations.

Direct impacts reflect jobs, payroll, and sales directly related to construction and operation phases. These types of impacts occur due to spending on salaries and wages, goods and services, and capital improvement projects. Indirect impacts result from jobs, payroll, and output created by businesses which provide goods and services to support the completion of each phase. Expenditures from these organizations create demand for the goods and services of other companies, who must then purchase goods and services and hire employees to produce their products. Induced impacts are the result of wage and salary spending by the direct and indirect employees on items such as food, housing, transportation, health care services, entertainment, etc. Spending by these employees creates further demand for goods and services, which then stimulates firms to purchase supplies and hire additional workers in order to meet that demand. The sum of these iterations constitutes the induced impacts.

## Model Specification

### Parameters for the Economic Impact

This report explores the potential economic impact of community solar installations on the state of New Mexico and on the counties served by the three largest energy providers in the state: PNM, SPS, and EPE. Impacts are evaluated over two phases in the two geographies. At present, the State of New Mexico has not specified allowable limits for solar power generation in the state and has not determined potential constraints for transmissions between counties. As such, economic and fiscal impact estimations developed in this report are meant as an exploratory tool.

The first of the two phases is construction. Economic effects generated during this period will occur once throughout the lifetime of the installation. Because specialized labor cannot always be sourced within the boundaries of the county where the installation is located, economic impacts of construction phases will be measured solely for the state.

Detailed expenditures data from previously completed out-of-state projects of varying megawattage and a single in-state 6.5 MW project was provided by the CCSA members who completed those ventures. Because diverse project sizes require different amounts of input from different industries, (permitting versus subscriber acquisition, for example), industrial ratios were developed with out-of-state data and applied to in-state figures to generate expenditure estimates for 2 and 5 MW plants in the local economy.

It is important to consider that costs do not experience linear changes in response to fluctuations in project megawatt size. Costs increase as project size expands, but the potential for economies of scale abounds. Those opportunities are not considered in developing the economic impact estimates presented in this report. Expenses from larger megawatt projects were scaled linearly to single megawatt projects. The industrial ratios described above were then applied to these data to create expenditure estimates for 2 and 5 MW projects.

Interviews with construction contractors reveal that an average of 2,700 labor hours are required per 1 MW project size. Payroll data for the 6.5 MW installation was adjusted according to those figures. Wage data is employed as a change (increase) in household income. Per CCSA and contractors interviewed by BBER, construction materials like racking, modules, and inverters are likely to be acquired from outside of the state. Their costs are not included in this analysis.

After construction is complete, an installation enters the operational phase, which consists largely of expenditures for maintenance and repair. Impacts experienced during this time will be smaller, as spending is neither as diverse nor as large as during the initial construction and set-up phase. Nonetheless these effects will compound while the system remains active. In addition to maintenance costs, operations expenditures in the New Mexico market include lease payments to landowners, subscription acquisition/management, and legal costs.

Lease rates were provided by CCSA for three of the 18 NM counties being considered for solar installations and verified using federal and state estimates. Average land lease rates were developed with data from those three counties whose values were then employed in impact calculations for counties with missing rent data. Per CCSA, 1 MW of solar power generation requires anywhere from 4 to 8 acres of land. This analysis employs the average, or 6 acres per 1 MW of power generation, 12 acres for a 2 MW project, and 30 acres for a 5 MW project.

Economic impacts are conducted for singular 2 and 5 MW solar installations within the state. Those effects are then scaled linearly to fulfill annual power generation of 25, 50, and 100 MW through either all 2 MW or all 5 MW installations, assuming that projects do not overlap by geography or contractor. Again, due to scaling-introduced variability, and because opportunities for economies of scale are not considered, these figures reflect rough estimates of potential impacts.

As reported in the next section, statewide economic impacts record the effect of construction phases, plus the initial operations phase, with inputs consisting of lease payments and local subscription acquisition & management costs. County-level analysis reflects latter operations costs, including legal fees, subscription management, and lease payments. Both analyses assume that the land where installations will be built is not currently in use and that the construction of a solar project will not negatively affect household incomes.

### Parameters for the Fiscal Impact

As solar installations are established in a region, their economic effects will generate changes to tax revenues for the area. Changes in employment opportunities, labor income, and industrial production affect gross receipts, property, and income taxes. As certain economic impacts could only be measured at the state-level, the fiscal impact presented in this report estimates tax contributions to the state. Results include estimates for tax collections from statewide 25, 50, and 100 MW annual generations.

### Data Sources

CCSA and their members provided expenditure data from studies in other states, plus a well-detailed database from a recent operation in New Mexico.

Fiscal impacts were determined using publicly available data from New Mexico Taxation & Revenue Department, New Mexico Department of Finance & Administration, and the U.S. Department of Commerce Bureau of Economic Analysis websites.

## Economic Impact

This section reports the results of the economic impact analysis. First, statewide estimates are reviewed. These include both construction and operation phases of the installations and are separated by generation output (2 or 5 MW). Results for the 18 counties served by PNM, SPS, and/or EPE are provided in the following sub-section. County-level analysis uses only operations phase inputs. The final sub-section describes the potential long-term impacts of compounding operations phases.

### State-level

Table 1 shows the result of the construction and operation phase of a single 2 MW solar installation in the whole of New Mexico. A single project of this size can increase state employment by 12 and generate an industrial production of $1.6 million for the economy. Additionally, results indicate that this installation can generate $462 thousand in labor income for the area. Table 2 is similar to Table 1, but illustrates the results of a single 5 MW project in the state. As expected, a larger project results in greater impacts. The 5 MW operation could support almost 38 jobs, produce a labor income of $1.46 million, and inject $5.2 million into the state economy through increased industrial production.

*Table 1: Statewide Economic Impact of a Single 2 MW Solar Installation in New Mexico*

| | Employment | Labor Income | Output |
|---|---|---|---|
| Direct | 1.7 | $66,006 | $255,724 |
| Indirect | 0.7 | $24,848 | $86,847 |
| Induced | 9.7 | $371,675 | $1,294,442 |
| **Total** | **12.1** | **$462,529** | **$1,637,013** |

Multiplier effects in each situation are large. In the 2 MW construction, the multiplier averages 6.8. The 5 MW project calculates an average of 4.1. Variability from scaling efforts surely affects these outcomes. As New Mexico defines its regulations for solar power, specific budgets can be applied on a per-project basis, thereby

changing the resulting multipliers. Improving knowledge over how economies of scale will affect developers at each site(s) will further improve impact reliability.

*Table 2: Statewide Economic Impact of a Single 5 MW Solar Installation in New Mexico*

| | Employment | Labor Income | Output |
|---|---|---|---|
| Direct | 8.6 | $370,332 | $1,344,103 |
| Indirect | 3.3 | $115,546 | $404,942 |
| Induced | 25.7 | $983,377 | $3,423,135 |
| **Total** | **37.6** | **$1,469,255** | **$5,172,180** |

Tables 3 and 4 outline the most affected sectors of the state economy for scenarios outlined in the previous tables. Effects are arranged by jobs creation. IMPLAN results suggest that, at the smaller scale, a single 2 MW operation will affect the advertising, public relations, & related service industry most, increasing employment by 1 for every 1 job directly created by a community solar installation. The output effect of that sector is $151 thousand. The sector detailing the construction of new power structures is also represented in this table, producing 0.5 jobs for every 1 community solar job and an industrial output of $87 thousand. These two sectors are the result of large expenditures in these areas, both for subscriber acquisition/management, and the construction of the installation. Food industries, real estate, retail, and health care are also heavily affected by the 2 MW installation, potentially from increases in household income.

*Table 3: 10 Largest Impacted Sectors of a Single 2 MW Solar Installation in New Mexico, by Employment*

| | Employment | Labor Income | Output |
|---|---|---|---|
| Advertising, public relations, and related services | 1 | $26,714 | $151,142 |
| Full-service restaurants | 0.6 | $12,778 | $27,242 |
| Limited-service restaurants | 0.6 | $10,799 | $43,997 |
| Real estate | 0.5 | $8,797 | $126,177 |
| Construction of new power and communication structures | 0.5 | $28,900 | $87,319 |
| Retail - General merchandise stores | 0.4 | $10,904 | $27,719 |
| Hospitals | 0.4 | $30,069 | $59,474 |
| Home health care services | 0.3 | $8,894 | $10,423 |
| Individual and family services | 0.3 | $6,783 | $10,057 |
| Retail - Food and beverage stores | 0.3 | $9,654 | $21,435 |

A facility generating 5 MW instead of 2 MW changes the distribution of affected industries. Table 4 examines the effects of a single 5 MW installation in the state. Again, weighty spending in construction and subscriber acquisition bring construction of new power structures and advertising services into the most affected

categories. An increase in megawatts produced implies an increased workload. As expected, employment, labor income, and output values are larger at the 5 MW level. The construction of new power structures sector sees an employment increase of 4 for every job directly created by a community solar installation. The same is true for the advertising, public relations, & related services sector. Both industries produce similar output as well, $670 thousand and $600 thousand, respectively. Restaurants, real estate, retail, and healthcare industries are also greatly affected by the 5 MW project.

Table 4: 10 Largest Impacted Sectors of a Single 5 MW Solar Installation in New Mexico, by Employment

| | Employment | Labor Income | Output |
|---|---|---|---|
| Construction of new power and communication structures | 4.1 | $221,906 | $670,481 |
| Advertising, public relations, and related services | 3.9 | $106,124 | $600,424 |
| Full-service restaurants | 1.6 | $34,710 | $74,002 |
| Limited-service restaurants | 1.5 | $29,081 | $118,481 |
| Real estate | 1.5 | $24,298 | $348,497 |
| Retail - General merchandise stores | 1 | $28,917 | $73,513 |
| Hospitals | 1 | $80,088 | $158,411 |
| Home health care services | 0.9 | $23,418 | $27,445 |
| Individual and family services | 0.8 | $18,013 | $26,708 |
| Retail - Food and beverage stores | 0.8 | $25,516 | $56,655 |

Tables 5 and 6 demonstrate the total state economic impacts of 25, 50, and 100 MW projects undertaken exclusively through 2 MW (Table 5) or 5 MW (Table 6) implementations. These were created using linear scales and should only be considered as rough estimations. In each table, the values in the first row double in the second row, and quadruple in the third. 5 MW constructions generate around 79% more economic output than their 2 MW counterparts at each level.

Table 5: Total Economic Impacts of 25, 50, and 100 MW Annual Power Generation through 2 MW Installations in the State of New Mexico

| Megawatts | Employment | Labor Income | Output |
|---|---|---|---|
| **25** | 151 | $5,781,613 | $20,462,663 |
| **50** | 303 | $11,563,225 | $40,925,325 |
| **100** | 605 | $23,126,450 | $81,850,650 |

Table 6: Total Economic Impacts of 25, 50, and 100 MW Annual Power Generation through 5 MW Installations in the State of New Mexico

| Megawatts | Employment | Labor Income | Output |
|---|---|---|---|
| **25** | 188 | $7,346,275 | $25,860,900 |
| **50** | 376 | $14,692,550 | $51,721,800 |
| **100** | 752 | $29,385,100 | $103,443,600 |

Tables 7 and 8 illustrate potential cumulative impacts of statewide implementations of solar facilities, for annual statewide generation of 50 and 100 MW. Table 7 records totals for productions completed exclusively through 2 MW facilities. Table 8 shows the same figures for 5 MW facilities. Totals in these tables do not consider the potential for economies of scale. In all, figures for statewide 50 MW solar power generation are half those of 100 MW generation schedules in each table.

*Table 7: Statewide Cumulative Economic Impacts for 3- and 5-year Outlooks for 50 and 100 MW Annual Output through Additional 2 MW facilities*

| | Outlook | Employment | Labor Income | Output |
|---|---|---|---|---|
| **50 MW** | 3-year | 908 | $34,689,675 | $122,775,975 |
| | 5-year | 1,513 | $57,816,125 | $204,626,625 |
| **100 MW** | 3-year | 1,815 | $69,379,350 | $245,551,950 |
| | 5-year | 3,025 | $115,632,250 | $409,253,250 |

Because construction effects subside after project completion, and because different construction projects may recruit from the same labor pool, outlook employment totals may represent recurring transfers of the same jobs rather than the creation of new jobs. With a 50 MW generation schedule, construction and initial operations phases of a series of 2 MW facilities could potentially create 908 new jobs in the local economy, cumulatively, after 3 years. After five years, this number is expected to increase to 1,513. Labor incomes range from $34.7 million for 3 years, and $57.8 million for 5 years for a 50 MW statewide schedule. Output figures for the same run from $122.8 million to $204.6 million.

Statewide impact estimates for strict 5 MW installations allow for employment, labor income, and output figures that are approximately 79% greater than those generated from 2 MW facilities. 3- and 5- year labor incomes are roughly $44.1 million and $73.5 million, respectively. Industrial output dollars are estimated at $155.2 million for 3-year outlooks and $258.6 million for 5-years.

*Table 8: Statewide Cumulative Economic Impacts for 3- and 5-year Outlooks for 50 and 100 MW Annual Output through Additional 5 MW facilities*

| | Outlook | Employment | Labor Income | Output |
|---|---|---|---|---|
| **50 MW** | 3-year | 1,128 | $44,077,650 | $155,165,400 |
| | 5-year | 1,880 | $73,462,750 | $258,609,000 |
| **100 MW** | 3-year | 2,256 | $88,155,300 | $310,330,800 |
| | 5-year | 3,760 | $146,925,500 | $517,218,000 |

## County-level

This sub-section considers the impact of the operations phase in each county served by PNM, SPS, and/or EPE. Economic effects in this section result from expenditures for subscriber management, legal services, and land lease payments. Though community solar installations can remain in operation for 25+ years, Tables 9 and 10 show the average effect of constructing installations at years 1, 5, and 20 (either 2 or 5 MW) with one additional plant built every year for 5 years. Because inputs are stable between counties, impact estimates do not demonstrate much variability (Appendix 1 and 2). Fluctuations in each column result mainly from economic dynamics unique to each county.

Table 9 specifies average, per-county, economic impacts from the operation phases of 2 MW facilities present in Appendix 1. At year one, the initial year, a single plant is in operation. We assumed one identical plant built in a county each year after year one, for five years. Year five has five plants in operation in a single county and those plants stay in operation through year 20. IMPLAN results suggest that the operations phases in counties currently served by PNM, SPS, and/or EPE can support 0.5 jobs, a labor income of $15.7 thousand, and almost $63 thousand in industrial output at year one. This includes both direct and indirect impacts.

At year five, it is assumed that 5 facilities are in operation, compounding the figures produced at year one: 2.5 jobs, $78.4 thousand in labor income, and $314 thousand in output; At year 20, those same 5 facilities are in operation, but the effects have accumulated throughout the lifespan of each installation, with an average of 40 jobs, $1.25 million in labor income, and $5 million in output supported by the installations. As stated earlier in the report, community solar facilities may have a lifespan of 25+ years, but 20-25 years is the average contract length.[9]

*Table 9: Average Economic Impacts of Operations Phase Expenditures, Assuming an Additional 2 MW Facility Every Year for the First 5 years in Counties Served by PNM, SPS, and/or EPE*

| | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|
| Year 1 | 0.5 | $15,682 | $24,763 | $62,889 |
| Year 5 | 2.5 | $78,408 | $123,813 | $314,444 |
| Year 20 | 40 | $1,254,529 | $1,981,004 | $5,031,102 |

[9] Contract length provided by CCSA data.

Averages from Appendix 2 are shows in Table 10, illustrating the average economic impacts from the operations phases of 5 MW facilities, also per-county, with an additional construction every year for the first 5 years. At the initial year of operations, the construction of a single 5 MW facility may potentially create 1.5 jobs, just under $45 thousand in labor income, and $187 in output. At year 20, with 5 plants in operation, those numbers increase to 117 jobs, almost $3.6 million in labor income, and nearly $15 million in industrial output.

*Table 10: Average Economic Impacts of Operations Phase Expenditures, Assuming an Additional 5 MW Facility Every 5 Years in Counties Served by PNM, SPS, and/or EPE*

| | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|
| Year 1 | 1.5 | $44,946 | $72,446 | $187,174 |
| Year 5 | 7.4 | $224,732 | $362,229 | $935,872 |
| Year 20 | 117.8 | $3,595,716 | $5,795,662 | $14,973,947 |

## Fiscal Impact

Due to variable constraints, fiscal impacts are estimated only at the state level. Below are the results of the fiscal analysis for the combined construction and operations phases of single 2 and 5 MW installations, as well as the scaled impact at 25, 50, and 100 MW.

The economic effects of a singular 2 MW facility in the state of New Mexico are expected to generate approximately $42 thousand in gross receipts taxes (GRT), $1,409 in total property taxes, and $2,896 in personal & corporate income taxes. GRT accounts for roughly 90% of the total $46 thousand in tax revenues. Small state mill rates and expected labor income (economic impact) estimations contribute to modest residential property tax collections. A 5 MW installation is expected to contribute almost $146 thousand to state wallets. Of that, $133 thousand is attributed to GRT, $4,080 to total property taxes, and $9,180 to total income taxes.

*Table 11: Fiscal Impacts of Annual Power Generation through 2 MW Installations in New Mexico*

| | 2 MW | 25 MW | 50 MW | 100 MW |
|---|---|---|---|---|
| Gross Receipt Taxes | $41,663 | $520,783 | $1,041,567 | $2,083,134 |
| Residential Property Taxes | $62 | $779 | $1,559 | $3,117 |
| Non-Residential Property Taxes | $1,347 | $16,832 | $33,664 | $67,329 |
| Personal Income Taxes | $1,712 | $21,404 | $42,808 | $85,617 |
| Corporate Income Taxes | $1,184 | $14,800 | $29,600 | $59,201 |
| **Total Revenues** | **$45,968** | **$574,599** | **$1,149,198** | **$2,298,397** |

*Table 12: Fiscal Impacts of Annual Power Generation through 5 MW Installations in New Mexico*

| | 5 MW | 25 MW | 50 MW | 100 MW |
|---|---|---|---|---|
| Gross Receipt Taxes | $132,617 | $663,084 | $1,326,167 | $2,652,335 |
| Residential Property Taxes | $198 | $990 | $1,981 | $3,961 |
| Non-Residential Property Taxes | $3,882 | $19,411 | $38,823 | $77,645 |
| Personal Income Taxes | $5,439 | $27,197 | $54,393 | $108,787 |
| Corporate Income Taxes | $3,741 | $18,705 | $37,409 | $74,819 |
| **Total Revenues** | **$145,877** | **$729,387** | **$1,458,773** | **$2,917,546** |

Fiscal impacts are scaled linearly to reflect the tax outcomes of a series of 2 MW or 5 MW installations totaling 25, 50, and 100 MW in annual output. At the 2 MW level, tax revenues range between $574 thousand for 25 MW of generated power and $2.3 million for 100 MW. 5 MW arrays for the same output record a range between $729 thousand and $2.9 million, indicating that tax revenues can be maximized through 5 MW installations. As above, values resulting from the scaling to 25, 50, and 100 MW are meant to be applied only as rough estimates as interviews with contractors indicate that linear scaling may not be appropriate if installations overlap by region or contractor.

# Conclusions

With the passage of Senate Bill 489, The Energy Transition Act, New Mexico is becoming primed for renewable development. However, policymakers will need to carefully consider what developments will best serve and create benefits for the most New Mexicans. Community solar projects not only offer a way for low-income residents and non-homeowners to purchase their electricity from renewable resources but also can benefit homeowners and businesses who are unable to install solar panels on their property.

Community solar projects also provide lease dollars for fallow lands. Many renewable installations require open, unobstructed space to maximize energy production; however, as community solar installations are smaller in scale, their development could provide benefits to landowners who might be overlooked in larger utility projects. When developing policy regulating these projects, the State will need to consider the maximum size of an individual installation and whether or not to create a state-wide cap on total operational capacity. These choices will affect the impacts described in this report and the economic viability of community solar on the whole.

The impact analysis demonstrates that economic changes resulting from the construction and operations phases of the installation of a single 2 MW solar array in the state of New Mexico can potentially support 12 jobs, provide $463 thousand in labor income, and create $1.64 million in industrial output. Effects generated through the construction and operation of a 5 MW facility in the state suggest that a total of 38 jobs are created, with $1.47 million in labor income and $5.17 million in output.

Potentially, 25, 50, and 100 MW projects undertaken exclusively through 2 MW implementations in the state can create between 151 (for 25 MW) and 605 jobs (for 75 MW), a labor income between $5.8 million and $23.1 million and an industrial output ranging from $20.5 million to $81.9 million, depending on the desired output. Similar strategies to generate the same production, but completed through 5 MW implementations, can yield between 188 and 752 jobs, $7.3 million and $29.4 million in labor income, and $25.9 million and $103.4 million in output. These potential impacts are attained using linear scales and should only be considered rough estimations. These figures are the product of independent constructions/operations without any regard to potential economies of scales.

IMPLAN results suggest that the average per county direct and indirect economic impacts of the operations phase for a single 2 MW facility support 0.5 jobs, $15.7 thousand in labor income, and $62.9 in industrial output. After 20 years, assuming a new 2 MW plant constructed in a single county every year for five years and in operation 20 years, those numbers compound, reflecting effects from the operations phase of five 2 MW facilities: 40 jobs, $1.25 million in labor income and $5 million in output. Average impacts from the over-time operations of 5 MW installations begin at 1.5 jobs, almost $45 thousand in labor income, and $187 thousand in output at year one (with a single 5 MW plant). At year 20, five 5 MW facilities can support 117.8 in employment, nearly $3.6 million in labor income, and almost $15 million in industrial output.

Fiscally, these installations can provide tax revenues in the form of gross receipts, property, and income taxes. Results demonstrate the potential for generating roughly $46 thousand in tax revenues as a response to economic activity from the construction and operation of a 2 MW facility. The potential for $146 thousand in

tax revenues exists at the 5 MW level. Expanding these fiscal effects to incorporate the impact estimates of 25, 50, and 100 MW capacities yields a range of $574 thousand to $2.3 million in tax revenues for a series of 2 MW projects and a range from $729 thousand to $2.9 million for projects exclusively employing 5 MW arrays.

# Appendix: County-Level Impacts over Time

*Table 13: County Economic Impacts of Operations Phase Expenditures, Assuming an Additional 2 MW Facility Every Year for the First 5 Years, 2020 dollars*

| | | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|---|
| **Bernalillo** | | | | | |
| | Year 1 | 0.6 | $24,427 | $40,134 | $83,518 |
| | Year 5 | 3 | $122,135 | $200,670 | $417,590 |
| | Year 20 | 48 | $1,954,160 | $3,210,720 | $6,681,440 |
| **Chaves** | | | | | |
| | Year 1 | 0.5 | $17,982 | $27,820 | $67,720 |
| | Year 5 | 2.5 | $89,910 | $139,100 | $338,600 |
| | Year 20 | 40 | $1,438,560 | $2,225,600 | $5,417,600 |
| **Curry** | | | | | |
| | Year 1 | 0.5 | $17,181 | $26,689 | $63,893 |
| | Year 5 | 2.5 | $85,905 | $133,445 | $319,465 |
| | Year 20 | 40 | $1,374,480 | $2,135,120 | $5,111,440 |
| **Dona Ana** | | | | | |
| | Year 1 | 0.5 | $18,636 | $29,197 | $67,546 |
| | Year 5 | 2.5 | $93,180 | $145,985 | $337,730 |
| | Year 20 | 40 | $1,490,880 | $2,335,760 | $5,403,680 |
| **Eddy** | | | | | |
| | Year 1 | 0.4 | $20,403 | $31,116 | $66,667 |
| | Year 5 | 2 | $102,015 | $155,580 | $333,335 |
| | Year 20 | 32 | $1,632,240 | $2,489,280 | $5,333,360 |
| **Grant** | | | | | |
| | Year 1 | 0.6 | $14,517 | $23,403 | $64,822 |
| | Year 5 | 3 | $72,585 | $117,015 | $324,110 |
| | Year 20 | 48 | $1,161,360 | $1,872,240 | $5,185,760 |
| **Hidalgo** | | | | | |
| | Year 1 | 0.4 | $5,064 | $8,435 | $37,831 |
| | Year 5 | 2 | $25,320 | $42,175 | $189,155 |
| | Year 20 | 32 | $405,120 | $674,800 | $3,026,480 |
| **Lea** | | | | | |
| | Year 1 | 0.4 | $20,901 | $31,839 | $68,055 |
| | Year 5 | 2 | $104,505 | $159,195 | $340,275 |
| | Year 20 | 32 | $1,672,080 | $2,547,120 | $5,444,400 |

| | | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|---|
| **Lincoln** | | | | | |
| | Year 1 | 0.6 | $16,987 | $27,389 | $71,280 |
| | Year 5 | 3 | $84,935 | $136,945 | $356,400 |
| | Year 20 | 48 | $1,358,960 | $2,191,120 | $5,702,400 |
| **Luna** | | | | | |
| | Year 1 | 0.5 | $14,935 | $22,056 | $60,836 |
| | Year 5 | 2.5 | $74,675 | $110,280 | $304,180 |
| | Year 20 | 40 | $1,194,800 | $1,764,480 | $4,866,880 |
| **Otero** | | | | | |
| | Year 1 | 0.5 | $14,982 | $23,643 | $63,231 |
| | Year 5 | 2.5 | $74,910 | $118,215 | $316,155 |
| | Year 20 | 40 | $1,198,560 | $1,891,440 | $5,058,480 |
| **Quay** | | | | | |
| | Year 1 | 0.5 | $13,286 | $21,886 | $60,593 |
| | Year 5 | 2.5 | $66,430 | $109,430 | $302,965 |
| | Year 20 | 40 | $1,062,880 | $1,750,880 | $4,847,440 |
| **Roosevelt** | | | | | |
| | Year 1 | 0.5 | $13,432 | $19,940 | $59,422 |
| | Year 5 | 2.5 | $67,160 | $99,700 | $297,110 |
| | Year 20 | 40 | $1,074,560 | $1,595,200 | $4,753,760 |
| **San Miguel** | | | | | |
| | Year 1 | 0.5 | $13,188 | $21,329 | $59,881 |
| | Year 5 | 2.5 | $65,940 | $106,645 | $299,405 |
| | Year 20 | 40 | $1,055,040 | $1,706,320 | $4,790,480 |
| **Sandoval** | | | | | |
| | Year 1 | 0.5 | $14,634 | $24,161 | $58,891 |
| | Year 5 | 2.5 | $73,170 | $120,805 | $294,455 |
| | Year 20 | 40 | $1,170,720 | $1,932,880 | $4,711,280 |
| **Santa Fe** | | | | | |
| | Year 1 | 0.6 | $21,891 | $35,259 | $75,727 |
| | Year 5 | 3 | $109,455 | $176,295 | $378,635 |
| | Year 20 | 48 | $1,751,280 | $2,820,720 | $6,058,160 |
| **Union** | | | | | |
| | Year 1 | 0.4 | $6,989 | $11,640 | $43,471 |
| | Year 5 | 2 | $34,945 | $58,200 | $217,355 |
| | Year 20 | 32 | $559,120 | $931,200 | $3,477,680 |
| **Valencia** | | | | | |
| | Year 1 | 0.5 | $12,834 | $19,790 | $58,614 |
| | Year 5 | 2.5 | $64,170 | $98,950 | $293,070 |
| | Year 20 | 40 | $1,026,720 | $1,583,200 | $4,689,120 |

Table 14: County Economic Impacts of Operations Phase Expenditures, Assuming an Additional 5 MW Facility Every Year for the First 5 Years, 2020 dollars

| | | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|---|
| **Bernalillo** | | | | | |
| | Year 1 | 1.7 | $71,141 | $119,315 | $249,460 |
| | Year 5 | 8.5 | $355,705 | $596,575 | $1,247,300 |
| | Year 20 | 136 | $5,691,280 | $9,545,200 | $19,956,800 |
| **Chaves** | | | | | |
| | Year 1 | 1.6 | $51,898 | $81,810 | $203,447 |
| | Year 5 | 8 | $259,490 | $409,050 | $1,017,235 |
| | Year 20 | 128 | $4,151,840 | $6,544,800 | $16,275,760 |
| **Curry** | | | | | |
| | Year 1 | 1.4 | $49,366 | $78,767 | $192,229 |
| | Year 5 | 7 | $246,830 | $393,835 | $961,145 |
| | Year 20 | 112 | $3,949,280 | $6,301,360 | $15,378,320 |
| **Dona Ana** | | | | | |
| | Year 1 | 1.6 | $55,292 | $88,027 | $203,263 |
| | Year 5 | 8 | $276,460 | $440,135 | $1,016,315 |
| | Year 20 | 128 | $4,423,360 | $7,042,160 | $16,261,040 |
| **Eddy** | | | | | |
| | Year 1 | 1.3 | $58,885 | $90,989 | $200,109 |
| | Year 5 | 6.5 | $294,425 | $454,945 | $1,000,545 |
| | Year 20 | 104 | $4,710,800 | $7,279,120 | $16,008,720 |
| **Grant** | | | | | |
| | Year 1 | 1.7 | $41,842 | $69,043 | $196,447 |
| | Year 5 | 8.5 | $209,210 | $345,215 | $982,235 |
| | Year 20 | 136 | $3,347,360 | $5,523,440 | $15,715,760 |
| **Hidalgo** | | | | | |
| | Year 1 | 1 | $12,909 | $21,574 | $96,814 |
| | Year 5 | 5 | $64,545 | $107,870 | $484,070 |
| | Year 20 | 80 | $1,032,720 | $1,725,920 | $7,745,120 |
| **Lea** | | | | | |
| | Year 1 | 1.4 | $59,797 | $92,033 | $203,745 |
| | Year 5 | 7 | $298,985 | $460,165 | $1,018,725 |
| | Year 20 | 112 | $4,783,760 | $7,362,640 | $16,299,600 |
| **Lincoln** | | | | | |
| | Year 1 | 1.7 | $49,521 | $81,433 | $214,284 |
| | Year 5 | 8.5 | $247,605 | $407,165 | $1,071,420 |
| | Year 20 | 136 | $3,961,680 | $6,514,640 | $17,142,720 |

| | | Employment | Labor Income | Value Added | Output |
|---|---|---|---|---|---|
| **Luna** | | | | | |
| | Year 1 | 1.5 | $41,182 | $61,740 | $183,276 |
| | Year 5 | 7.5 | $205,910 | $308,700 | $916,380 |
| | Year 20 | 120 | $3,294,560 | $4,939,200 | $14,662,080 |
| **Otero** | | | | | |
| | Year 1 | 1.5 | $42,582 | $68,798 | $189,904 |
| | Year 5 | 7.5 | $212,910 | $343,990 | $949,520 |
| | Year 20 | 120 | $3,406,560 | $5,503,840 | $15,192,320 |
| **Quay** | | | | | |
| | Year 1 | 1.5 | $37,640 | $64,407 | $182,146 |
| | Year 5 | 7.5 | $188,200 | $322,035 | $910,730 |
| | Year 20 | 120 | $3,011,200 | $5,152,560 | $14,571,680 |
| **Roosevelt** | | | | | |
| | Year 1 | 1.5 | $38,109 | $57,594 | $179,230 |
| | Year 5 | 7.5 | $190,545 | $287,970 | $896,150 |
| | Year 20 | 120 | $3,048,720 | $4,607,520 | $14,338,400 |
| **San Miguel** | | | | | |
| | Year 1 | 1.5 | $37,614 | $63,470 | $179,752 |
| | Year 5 | 7.5 | $188,070 | $317,350 | $898,760 |
| | Year 20 | 120 | $3,009,120 | $5,077,600 | $14,380,160 |
| **Sandoval** | | | | | |
| | Year 1 | 1.4 | $42,569 | $72,358 | $178,442 |
| | Year 5 | 7 | $212,845 | $361,790 | $892,210 |
| | Year 20 | 112 | $3,405,520 | $5,788,640 | $14,275,360 |
| **Santa Fe** | | | | | |
| | Year 1 | 1.7 | $64,604 | $106,145 | $228,966 |
| | Year 5 | 8.5 | $323,020 | $530,725 | $1,144,830 |
| | Year 20 | 136 | $5,168,320 | $8,491,600 | $18,317,280 |
| **Union** | | | | | |
| | Year 1 | 1 | $18,168 | $30,153 | $110,941 |
| | Year 5 | 5 | $90,840 | $150,765 | $554,705 |
| | Year 20 | 80 | $1,453,440 | $2,412,240 | $8,875,280 |
| **Valencia** | | | | | |
| | Year 1 | 1.5 | $35,917 | $56,368 | $176,683 |
| | Year 5 | 7.5 | $179,585 | $281,840 | $883,415 |
| | Year 20 | 120 | $2,873,360 | $4,509,440 | $14,134,640 |