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California Energy Commission

STAFF PAPER

Staff Review and Analysis for City of Needles' Application for a Solar Photovoltaic Determination

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ABSTRACT

The California Energy Commission (CEC) adopted amendments to the California Building Standards Code and specifically the Administrative Code and the 2019 Energy Code (California Code of Regulations, Title 24, Part 1, Chapter 10, and Part 6) that went into effect January 1, 2020. These amendments included provisions requiring the installation of solar photovoltaic (PV) systems on newly constructed, low-rise residential buildings, in section 150.1(c)14 of the Energy Code.

As part of the adoption, Administrative Code section 10-109(k), Photovoltaic System Requirement Determination, states, "The Commission may, upon written application or its own motion, determine that the photovoltaic requirements in [section] 150.1(c)14 shall not apply, if the Commission finds that the implementation of public agency rules regarding utility system costs and revenue requirements, compensation for customer-owned generation, or interconnection fees, causes the Commission's cost effectiveness conclusions, made pursuant to Public Resources Code 25402(b)(3), to not hold for particular buildings."

The City of Needles submitted an application for a determination regarding whether the solar PV system requirements should apply to homes in its jurisdiction. CEC staff has reviewed the application and found it complete. Staff has performed a cost-effectiveness analysis based on the public agency rules adopted by the City of Needles and recommends approval of the application. This staff report documents the analysis completed in making the recommendation.

Keywords: Solar photovoltaic determination, 10-109(k), solar PV requirement, solar, PV, Building Energy Efficiency Standards.

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TABLE OF CONTENTS

Page

Abstract.....i

Table of Contents.....iii

List of Figures.....iii

List of Equations.....iii

Executive Summary.....1

Background.....1

Recommendation.....2

CHAPTER 1: City of Needles.....3

Summary of Needles' Application.....3

CHAPTER 2: Staff Analysis.....5

Staff Analysis of Needles' Application.....5

Life Cycle Cost-Effectiveness Results.....11

CHAPTER 3: Conclusion.....13

Staff Recommendation.....13

GLOSSARY.....14

APPENDIX A: Life-Cycle Cost-Effectiveness Analysis .....A

APPENDIX B: Energy Cost Savings Analysis .....B

APPENDIX C: Needles PV Determination Application C

APPENDIX D: Needles Financial Management Plan .....D

APPENDIX E: Needles Historical Rate Schedules .....E

APPENDIX F: Resources .....F

LIST OF TABLES

Page

Table 1: Weighted Average PV Size and Production for Prototype Homes 7

Table 2: 2021-2030 Energy Cost Savings 10

Table 3: Cost-Effectiveness Results 12

LIST OF EQUATIONS

Page

Equation 1: Benefit-to-Cost Ratio.....6

Equation 2: Present Value.....11

EXECUTIVE SUMMARY

Background

On May 9, 2018, the California Energy Commission (CEC) adopted the 2019 Energy Code, which includes solar photovoltaic requirements for all newly constructed low-rise residential buildings in section 150.1(c)14. Low-rise residential buildings are defined as single-family houses, duplexes, and townhomes, as well as multifamily buildings that are three stories or fewer. These requirements, along with the rest of the 2019 Energy Code, went into effect January 1, 2020.

As part of the adoption, section 10-109(k), Photovoltaic System Requirement Determination, states, "The Commission may, upon written application or its own motion, determine that the photovoltaic requirements in §150.1(c)14 shall not apply, if the Commission finds that the implementation of public agency rules regarding utility system costs and revenue requirements, compensation for customer-owned generation, or interconnection fees, causes the Commission's cost effectiveness conclusions, made pursuant to Public Resources Code 25402(b)(3), to not hold for particular buildings."

The regulations require that an applicant must provide information on the differences between public agency rules and Energy Commission's cost-effectiveness determinations and the way in which these differences cause the statewide determination to not be applicable within a jurisdiction or territory, including any information requested by the Commission to enable full review of the application. Applications from public agencies must be submitted to the Commission only after public review within the jurisdiction of the agency or service area of the utility. The regulations do not require applicants to submit a cost-effectiveness analysis.

The City of Needles (Needles) submitted an application to the Energy Commission on August 14, 2019, to determine, as specified under section 10-109(k), whether the solar PV system requirements should apply to newly constructed, low-rise residential buildings in its jurisdiction. Staff reviewed the Needles application and requested additional information. Needles conducted an electric rate plan study and submitted that to the Commission on July 16, 2020. Staff then determined that the application was complete and included sufficient information for staff to make a recommendation.

Recommendation

Staff reviewed the Needles application and the supplemental electric rate plan study. Based on all the information received, staff performed a life-cycle cost-effectiveness analysis to determine if Needles' public agency rules would cause solar PV not to be cost-effective in its jurisdiction. Staff found that applying Needles' residential rates and net-energy-metering rules for the analysis resulted in solar PV not being cost-effective. The results showed that the cost savings generated from having solar PV were less than the solar PV system cost, a benefit-to-cost ratio of less than 1.0.

Based on the analysis presented, staff has determined that Needles' rules regarding residential rates and compensation for customer-owned generation cause the Commission's cost-effectiveness conclusion for solar PV systems not to hold.

CHAPTER 1:
City of Needles

Summary of City of Needles' Application

Needles is a small community of roughly 5,000 residents in eastern San Bernardino County, near the borders of Nevada and Arizona. The City of Needles provides electric service to its residents through Needles Public Utility Authority (NPUA).

NPUA structures its electric rates based on the season and customer consumption. A large portion of its electricity is from hydroelectric power. NPUA electric rates vary slightly year-to-year and include a winter "hydro" rate, a winter "over hydro" rate, a summer "hydro" rate, and a summer "over hydro" rate, with a hydro allotment specified for each season.

As an example, for the current rate schedule, the winter hydro allotment is 405 kilowatt-hours (kWh), and the summer hydro allotment is 758 kWh per monthly billing period. During the winter months, customers are charged a "hydro" rate of $0.0636 per kWh for electric consumption up to 405 kWh and an "over hydro" rate of $0.0872 per kWh for any electric consumption above 405 kWh. During the summer months, customers are charged a "hydro" rate of $0.0594 per kWh for electric consumption up to 758 kWh and an "over hydro" rate of $0.0872 per kWh for any electric consumption above 758 kWh. (See Appendix C, Residential Energy Rate Schedules)

For customers with solar PV, NPUA's net-energy-metering (NEM) rules allow electricity generation from PV systems installed on customers' homes to be valued at these same rates. Any net-monthly consumption of electricity is calculated according to the terms of the rate schedule. If a customer is a net generator over a billing period, the net kWh generated is valued at the same rate NPUA would charge for the baseline quantity of electricity during that billing period ("hydro" rate). If the number of kWh generated exceeds the baseline quantity, the excess is valued at the same rate as NPUA would charge for electricity over the baseline quantity during the billing period ("over hydro" rate). (See Appendix C, Photovoltaic Interconnection Agreement)

On August 14, 2019, Needles submitted an application identifying that NPUA residential energy rates are lower than the energy rates used by the California Energy Commission (CEC) when determining cost-effectiveness of solar PV system requirements. Moreover, the 2019 residential solar PV requirements are not cost effective when the NPUA rates are used. Needles also proposed that NPUA energy rates escalate at a lower rate than the 2.7 percent that the CEC used for its cost-effectiveness determination.

Needles' application includes:

- A cover letter that summarizes the proposal.

- A residential energy rate schedule.
- The NPUA electric rate calculation template.
- The NPUA PV interconnection agreement.
- The signed resolution requesting a PV requirement determination.

Needles conducted a public hearing on August 13, 2019 and approved the decision to seek a determination from the CEC under Title 24, Part 1, section 10-109(k).

Staff made the application available for comment to interested parties by posting it on CEC's website.[1] The application was docketed (19-BSTD-07) for a 60-day public comment period, which concluded November 19, 2019.

In addition, staff requested that Needles provide information that supports determining reasonable escalation for NPUA energy rates. Needles responded by submitting 10 years of historical rate schedule data and hiring a consultant to perform a financial management plan that analyzes the electric cost of service for its utility through 2030. This financial management plan that includes energy rate projection was completed and approved at a public hearing on July 14, 2020. Needles submitted it to the CEC shortly after. (See Appendix D, Needles Financial Management Plan)

Needles' additional information considered:

- Needles Financial Management Plan for Energy Rate Projection.
- 10 years of historical rate schedule data.

1 California Energy Commission Proceedings. https://ww2.energy.ca.gov/dockets/index_cms.php.

CHAPTER 2:
Staff Analysis

Staff Analysis of the Needles Application

Development of the new solar PV requirement for newly constructed low-rise homes for the 2019 Energy Code relied largely on two main sources to develop technical information and determine cost effectiveness:

- *2019 Time Dependent Valuation Methodology Report*[2]
- *Measure Proposal Rooftop Solar PV Systems*[3]

These reports describe the CEC's life-cycle cost method used to evaluate proposed changes to the 2019 Energy Code and, specifically, the energy cost-savings method used for determining the cost-effectiveness of the solar PV requirement. CEC staff used the same life-cycle cost approach to determine the cost-effectiveness of solar PV systems subject to the public agency rules adopted by Needles to establish residential rates and solar PV compensation.

Staff developed spreadsheets to perform calculations for the Needles application.

2 California Energy Commission. February 2017. Time Dependent Valuation of Energy for Developing Building Efficiency Standards: 2019 Time Dependent Valuation (TDV) Data Sources and Inputs. https://efiling.energy.ca.gov/getdocument.aspx?tn=216062.

3 California Energy Commission. September 2017. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2019 Update to the Title 24 Part 6 Building Energy Efficiency Standards Rooftop Solar PV System. https://efiling.energy.ca.gov/GetDocument.aspx?tn=222201&DocumentContentId=2737.1

Life-Cycle Cost-Effectiveness Determination

Staff evaluated whether implementing Needles' rules would cause the cost-effectiveness of solar PV not to hold. Staff used Needles' current residential rates, approved future residential rates through 2030, NEM compensation rules, California Building Energy Code Compliance software (CBECC-Res 2019) runs, and the inputs described below to evaluate cost-effectiveness.

A measure is cost-effective if the benefit-to-cost ratio is greater than 1.0. The ratio is calculated by dividing the total present value of the life-cycle cost benefits by the present value of the total incremental costs. Specific to the solar PV measure, this ratio would be the present value of cost savings divided by the present value of the PV system costs.

Equation 1: Benefit-to-Cost Ratio

$$\text{Benefit-to-Cost Ratio} = \frac{\text{Present Value of Cost Savings}}{\text{Present Value of PV System Costs}}$$

Calculating PV Size and Annual Production

The 2019 Energy Code requires a solar PV system that generates enough electricity to match the annual electricity consumption needed by a mixed-fuel, low-rise home complying with the energy efficiency requirements of the 2019 Energy Code. The minimum solar PV size and the annual generation applicable to a given building are able to be calculated using CBECC-Res 2019, which is an open-source software program for demonstrating compliance with the 2019 Energy Code when using the performance approach. The National Renewable Energy Laboratory (NREL) algorithms underlying the PV Watts program are installed in CBECC-Res for PV system analysis. CBECC-Res establishes energy budget requirements, including PV system size requirements.

To determine the PV size for the life-cycle cost calculation, staff used a weighted average from CBECC-Res runs for the CEC's two low-rise, residential, single-family prototype homes. These homes met all standard design requirements, including:

Energy efficiency features.

- High-performance attic (certain climates): R19 below deck
- High-performance walls (certain climates): 0.043 U-factor wall
- Quality insulation inspection (QII)
- High-performance windows: U-factor 0.30, SHGC 0.23 for cooling climates and 0.50 for mild climates
- Doors: U-factor 0.20
- 2016 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) 62.2 ventilation rates. Heating, ventilation and air-

conditioning (HVAC) fan efficacy: 0.40 watts per cubic feet per minute (W/cfm)
- Federal appliance standard efficiency for furnaces, air conditioners, and water heaters

Solar PV system features.

- 170° south-facing orientation
- 5/12 pitch roof
- 96 percent inverter efficiency
- Standard module type
- No shading

Climate Zone

Needles is located entirely in Climate Zone 15. Using the above methodology an average minimum PV size of 5.42 kilowatts is required in Climate Zone 15. This system produces 9,072 kWh per year.

Table 1: Weighted Average PV Size and Production for Prototype Homes (CBECC)

	2,100 Square Foot Prototype (45%)	2,700 Square Foot Prototype (55%)	Weighted Average
PV Size	4.91	5.84	**5.42**
Annual Production	8,223	9,766	**9,072**

Source: California Energy Commission

Inputs Used for Life-Cycle Cost-Effectiveness Calculation

Inputs for the following parameters in the life-cycle cost calculation described in the following sections are consistent with those used to determine the cost-effectiveness of the solar PV system measure proposal or determined by Needles' public agency rules.

Life-Cycle Analysis Period

The life-cycle analysis period of 30 years is consistent with the *2019 TDV Methodology Report.*[4] All cost-effectiveness analyses completed for the 2019 Energy Code low-rise residential requirements were used for this analysis period.

PV Cost per Watt

The statewide PV cost-per-watt input of $3.08 per watt was obtained from the *Measure Proposal Rooftop Solar PV Systems*[5] report. In 2016, the incremental first cost was determined to be $2.93 per watt according to NREL's estimate of the first quarter 2016 cost of a 5.6 kilowatt residential solar PV system installed in California. This cost includes the PV module, inverter, structural balance of system, electrical balance of system, supply chain costs, sales tax, installation labor, permitting, inspection, interconnection, customer acquisition, general and administrative overhead, and net profit to the installer.

Applying inflation rates and NREL cost reduction forecast assumptions, the incremental cost was estimated to be $2.63 per watt in 2020 dollars. A lifetime incremental maintenance cost was then added to account for periodic equipment maintenance and two inverter replacements over 30 years. This addition resulted in the solar PV system cost of $3.08 per watt in 2020 dollars.

Complete information regarding PV cost per watt can be found in Chapter 5 of the *Measure Proposal Rooftop Solar PV Systems*[6] report.

4 Ibid.

5 Ibid.

6 Ibid.

Energy Escalation

An energy escalation input of 2.7 percent was specified in the *2019 TDV Methodology Report*[7] and used to evaluate code changes proposed for the 2019 Energy Code. The report references the *2015 Integrated Energy Policy Report* (IEPR), which calculates average residential rates for Pacific Gas and Electric, Southern California Edison, San Diego Gas & Electric, Los Angeles Department of Water and Power, and Sacramento Municipal Utility District through 2026. All cost-effectiveness analyses completed for 2019 Energy Code low-rise residential requirements therefore used a compound average growth rate of 2.7 percent per year nominal increase for forecasting residential rates.

Needles proposed that its energy escalation rate is lower than the 2.7 percent statewide escalation rate used to determine the cost-effectiveness of the PV measure. Historically, its energy rates have been low-cost and remained flat over the last 10 years. Needles hired a consultant to prepare a detailed financial management plan that analyzes the electric cost of service for its utility through 2030. This financial management plan that includes energy rate schedules through 2030 was completed and approved at a public hearing on July 14, 2020. The highest year-over-year escalation seen in this study was 1.0 percent. (See Appendix D, Needles Financial Management Plan)

For this analysis staff used the actual approved energy rate schedules for 2021 through 2030 found in the financial management plan and a 1.0 percent energy escalation rate for 2031 through 2050.

Discount Rate

The real discount rate input of 3 percent was obtained from the *2019 TDV Methodology Report.*[8] All cost-effectiveness analyses completed for 2019 Energy Code requirements used a 3 percent real (inflation-adjusted) discount rate to calculate the net present

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7 California Energy Commission. February 2017. Time Dependent Valuation of Energy for Developing Building Efficiency Standards: 2019 Time Dependent Valuation (TDV) Data Sources and Inputs. https://efiling.energy.ca.gov/getdocument.aspx?tn=216062.

8 California Energy Commission. February 2017. Time Dependent Valuation of Energy for Developing Building Efficiency Standards: 2019 Time Dependent Valuation (TDV) Data Sources and Inputs. https://efiling.energy.ca.gov/getdocument.aspx?tn=216062.

value. It is a long-standing practice for the cost-effectiveness analysis of energy code requirements to use a 3 percent real discount rate.

Present Value of Cost Savings

The energy cost savings were determined by using the hourly building loads and hourly PV generation calculated from CBECC-Res 2019 for each prototype home, the Needles energy rate schedules from 2021 through 2030, and its NEM rules. Needles' NEM rules allow customers with solar PV to receive credit for all electricity generated by the solar PV system. The credit is equal to energy rates specified in the customer's rate schedule.

Staff performed the analysis by generating energy charges (monthly utility bills) for the non-PV customer and the PV customer for each prototype home. CBECC-Res hourly data for consumption and generation were applied to appropriate energy rates throughout the year for each customer to calculate the energy charges (or credits). The difference in annual charges, comparing the non-PV customer versus the PV customer, is the annual energy cost savings of having a PV system.

Following the CEC method, the weighted average of 45 percent for the 2,100 square foot (SF) prototype and 55 percent for the 2,700 SF prototype was used to determine the final annual energy cost savings. This analysis performed for years 2021 through 2030. (See Appendix B, Energy Cost Savings Analysis) Table 2 summarizes the final energy cost savings.

Table 2: 2021-2030 Energy Cost Savings

Climate Zone	15
PV Size (kW)	5.420
Annual Production (kWh)	9,072
Year	Energy Cost Savings
2021	$ 623.82
2022	$ 624.82
2023	$ 625.20
2024	$ 633.20
2025	$ 641.60
2026	$ 647.68
2027	$ 658.53
2028	$ 666.84
2029	$ 675.96
2030	$ 685.28

Source: California Energy Commission

Staff calculated the present value of the cost savings by using an equivalent method to the standard financial equation for calculating present value of a growing annuity, as shown below. This equation calculates the present value of total future cost savings based on the annual cost savings, the discount rate, the growth (escalation) rate, and the number of periods compounded.

Equation 2: Present Value

$$\text{Present Value} = \frac{P}{r-g} \times \left[1 - \left(\frac{1+g}{1+r}\right)^{n}\right]$$

P = annual cost savings
r = discount rate = 3%
g = growth (escalation) rate per period of = 1.0%
n = number of periods of analysis period = 30 years

Staff used the net present value function (NPV) in Microsoft Excel® to perform the calculation. For 2021 through 2030, staff used the actual calculated energy cost savings described above. The energy cost savings for 2030 was then escalated at 1.0 percent to determine the energy cost savings for 2031 through 2050. Staff then applied the NPV function to the whole 30-year period using a 3.0 percent discount rate. This application resulted in a present value of cost savings of $13,868.79.

Table 3 in the "Life-Cycle Cost-Effectiveness Results" section below shows the calculations.

Present Value of PV System Cost

The present value of PV system costs is determined by the PV size as calculated by CBECC-Res 2019 and the cost per watt as described earlier in the assumptions. The solar PV production estimated by CBECC-Res 2019 for the prototype home (weighted average) in Needles was 5.42 kilowatts. Multiplying by the PV cost per watt assumption of $3.08 resulted in a PV system cost of $16,693.60.

Life-Cycle Cost-Effectiveness Results

Staff developed spreadsheets including all equations and assumptions discussed in the previous sections. Applying Needles energy rates and NEM rules into the spreadsheet calculations resulted in the solar PV requirement not being cost-effective.

As shown in Table 3, the benefit-to-cost ratio for Needles was 0.83, lower than the benefit-to-cost threshold of 1.0. The analysis determines that the solar PV requirement loses $2,824.81 over the life-cycle period of 30 years.

Table 3: Cost-Effectiveness Results

Inputs	
Applicant	Needles
Climate Zone	15
PV Size (kW)	5.420
Annual Production (avoided kWh)	9,072
2021 Energy Cost Savings	$ 623.82
2022 Energy Cost Savings	$ 624.82
2023 Energy Cost Savings	$ 625.20
2024 Energy Cost Savings	$ 633.20
2025 Energy Cost Savings	$ 641.60
2026 Energy Cost Savings	$ 647.68
2027 Energy Cost Savings	$ 658.53
2028 Energy Cost Savings	$ 666.84
2029 Energy Cost Savings	$ 675.96
2030 Energy Cost Savings	$ 685.28

Assumptions	
PV Cost per Watt ($/W)	3.08
Energy Escalation Rate*	1.00%
Discount Rate, Real	3.00%
Life Cycle Period (years)	30

***Applies year 2031 through 2050**

Results	
Present Value of PV System Cost	$ 16,693.60
Present Value of Energy Cost Savings	$ 13,868.79
Net Savings	$ (2,824.81)
Benefit-to-Cost Ratio	0.83

Source: California Energy Commission

CHAPTER 3:
Conclusion

Staff Recommendation

Based on CEC staff's analysis, staff recommends that the CEC determine that the public agency rules of the City of Needles regarding residential rates and compensation for customer-owned generation cause the CEC's cost-effectiveness conclusion for the solar PV requirement not to hold. This recommendation applies to newly constructed, low-rise homes in the City of Needles subject to the 2019 Energy Code.

GLOSSARY

American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) is a professional association seeking to advance heating, ventilation, air conditioning, and refrigeration systems design and construction.

Climate zones are the 16 geographic areas of California for which the California Energy Commission has established typical weather data, prescriptive packages, and energy budgets.

Hydroelectricity is a form of energy that harnesses the power of flowing water to generate electricity.

National Renewable Energy Laboratory (NREL) is a government-owned facility funded through the United States Department of Energy with research and development in renewable electricity, energy productivity, energy storage, systems integration, and sustainable transportation.

Net Energy Metering (NEM) is a utility billing mechanism that allows customers who generate electricity to receive credit for electricity they add to the utility grid.

Performance approach is an approach to show compliance with the 2019 Energy Code by using an approved software program to model a proposed building and compare it to a calculated energy budget.

PV Watts is a calculator developed by NREL that estimates the energy production and cost of solar photovoltaic systems.

R-value is the measure of the thermal resistance of insulation or any material or building component expressed in ft^2-hr-^oF/Btu.

Solar heat gain coefficient (SHGC) is the ratio of the solar heat gain entering the space through the fenestration area to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted, or convected into the space.

U-factor is the overall coefficient of thermal transmittance of a fenestration, wall, floor, or roof/ceiling component, in Btu/(hr x ft^2 x ^oF), including air film resistance at both surfaces.

APPENDIX A:
Life-Cycle Cost-Effectiveness Analysis

Inputs	
Applicant	Needles
Climate Zone	15
PV Size (kW)	5.420
Annual Production (avoided kWh)	9,072
2021 Energy Cost Savings	$ 623.82
2022 Energy Cost Savings	$ 624.82
2023 Energy Cost Savings	$ 625.20
2024 Energy Cost Savings	$ 633.20
2025 Energy Cost Savings	$ 641.60
2026 Energy Cost Savings	$ 647.68
2027 Energy Cost Savings	$ 658.53
2028 Energy Cost Savings	$ 666.84
2029 Energy Cost Savings	$ 675.96
2030 Energy Cost Savings	$ 685.28

Assumptions	
PV Cost per Watt ($/W)	3.08
Energy Escalation Rate*	1.00%
Discount Rate, Real	3.00%
Life Cycle Period (years)	30

***Applies year 2031 through 2050**

Results	
Present Value of PV System Cost	$ 16,693.60
Present Value of Energy Cost Savings	$ 13,868.79
Net Savings	$ (2,824.81)
Benefit-to-Cost Ratio	0.83

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Savings	$ 623.82	$ 624.82	$ 625.20	$ 633.20	$641.60	$647.68	$658.53	$666.84	$675.96	$685.28

Year	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Savings	$ 692.13	$ 699.05	$ 706.04	$ 713.10	$720.23	$727.44	$734.71	$742.06	$749.48	$756.97

Year	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Savings	$ 764.54	$ 772.19	$ 779.91	$ 787.71	$795.59	$803.54	$811.58	$819.69	$827.89	$836.17

Present Value of Savings $13,868.79

APPENDIX B:
Energy Cost Savings Analysis

2021 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (March - September)	740	$ 0.0603	$ 0.0860
Winter (October - February)	395	$ 0.0645	$ 0.0860

Climate Zone 15 2100 SF Protoype **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
1	359.37	359.37	-	$ 23.18	563.22	-	-	203.85	$ -	$ 13.15
2	305.58	305.58	-	$ 19.71	547.18	-	-	241.60	$ -	$ 15.58
3	334.76	334.76	-	$ 20.19	732.54	-	-	397.78	$ -	$ 23.99
4	375.05	375.05	-	$ 22.62	793.95	-	-	418.90	$ -	$ 25.26
5	681.59	681.59	-	$ 41.10	808.60	-	-	127.01	$ -	$ 7.66
6	1,051.71	740.00	311.71	$ 71.43	775.63	276.08	-	-	$ 16.65	$ -
7	1,362.26	740.00	622.26	$ 98.14	763.68	598.58	-	-	$ 36.09	$ -
8	1,365.90	740.00	625.90	$ 98.45	770.00	595.90	-	-	$ 35.93	$ -
9	1,066.44	740.00	326.44	$ 72.70	657.66	408.79	-	-	$ 24.65	$ -
10	616.54	395.00	221.54	$ 44.53	685.49	-	-	68.95	$ -	$ 4.45
11	343.94	343.94	-	$ 22.18	590.89	-	-	246.94	$ -	$ 15.93
12	359.68	359.68	-	$ 23.20	533.98	-	-	174.30	$ -	$ 11.24
Total	**8,222.82**	**6,114.97**	**2,107.86**	**$ 557.42**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 113.32**	**$ 117.25**
									Annual True Up Charge	$ (3.93)
			Total Annual Charge	**$ 557.42**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 557.42

Climate Zone 15 2700 SF Protoype **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
1	421.15	395.00	26.15	$ 27.73	668.94	-	-	247.78	$ -	$ 15.98
2	358.38	358.38	-	$ 23.12	649.89	-	-	291.51	$ -	$ 18.80
3	401.24	401.24	-	$ 24.19	870.03	-	-	468.79	$ -	$ 28.27
4	468.57	468.57	-	$ 28.25	942.97	-	-	474.40	$ -	$ 28.61
5	837.33	740.00	97.33	$ 52.99	960.37	-	-	123.04	$ -	$ 7.42
6	1,271.76	740.00	531.76	$ 90.35	921.21	350.55	-	-	$ 21.14	$ -
7	1,622.37	740.00	882.37	$ 120.51	907.02	715.35	-	-	$ 43.14	$ -
8	1,606.31	740.00	866.31	$ 119.12	914.53	691.79	-	-	$ 41.71	$ -
9	1,251.15	740.00	511.15	$ 88.58	781.09	470.05	-	-	$ 28.34	$ -
10	696.91	395.00	301.91	$ 51.44	814.15	-	-	117.25	$ -	$ 7.56
11	405.12	395.00	10.12	$ 26.35	701.79	-	-	296.67	$ -	$ 19.14
12	425.91	395.00	30.91	$ 28.14	634.21	-	-	208.30	$ -	$ 13.44
Total	**9,766.18**	**6,508.18**	**3,258.00**	**$ 680.77**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 134.33**	**$ 139.21**
									Annual True Up Charge	$ (4.88)
			Total Annual Charge	**$ 680.77**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 680.77

Climate Zone 15 45%/55% Weighted **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
1	393.35	393.35	-	$ 25.37	621.37	-	-	228.01	$ -	$ 14.71
2	334.62	334.62	-	$ 21.58	603.67	-	-	269.05	$ -	$ 17.35
3	371.32	371.32	-	$ 22.39	808.16	-	-	436.84	$ -	$ 26.34
4	426.48	426.48	-	$ 25.72	875.91	-	-	449.43	$ -	$ 27.10
5	767.25	740.00	27.25	$ 46.97	892.07	-	-	124.83	$ -	$ 7.53
6	1,172.74	740.00	432.74	$ 81.84	855.70	317.04	-	-	$ 19.12	$ -
7	1,505.32	740.00	765.32	$ 110.44	842.52	662.81	-	-	$ 39.97	$ -
8	1,498.13	740.00	758.13	$ 109.82	849.49	648.64	-	-	$ 39.11	$ -
9	1,168.03	740.00	428.03	$ 81.43	725.55	442.48	-	-	$ 26.68	$ -
10	660.74	395.00	265.74	$ 48.33	756.26	-	-	95.51	$ -	$ 6.16
11	377.59	377.59	-	$ 24.35	651.88	-	-	274.29	$ -	$ 17.69
12	396.10	395.00	1.10	$ 25.57	589.11	-	-	193.00	$ -	$ 12.45
Total	**9,071.67**	**6,393.36**	**2,678.31**	**$ 623.82**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 124.88**	**$ 129.33**
									Annual True Up Charge	$ (4.45)
			Total Annual Charge	**$ 623.82**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 623.82

2022 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	730	$ 0.0605	$ 0.0854
Winter (Jan - Feb; Oct - Dec)	390	$ 0.0646	$ 0.0854

Climate Zone 15 2100 SF Protoype **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 23.22	563.22	-	-	203.85	$ -	$ 13.17
Feb	305.58	305.58	-	$ 19.74	547.18	-	-	241.60	$ -	$ 15.61
Mar	334.76	334.76	-	$ 20.25	732.54	-	-	397.78	$ -	$ 24.07
Apr	375.05	375.05	-	$ 22.69	793.95	-	-	418.90	$ -	$ 25.34
May	681.59	681.59	-	$ 41.24	808.60	-	-	127.01	$ -	$ 7.68
Jun	1,051.71	730.00	321.71	$ 71.64	775.63	276.08	-	-	$ 16.70	$ -
Jul	1,362.26	730.00	632.26	$ 98.16	763.68	598.58	-	-	$ 36.21	$ -
Aug	1,365.90	730.00	635.90	$ 98.47	770.00	595.90	-	-	$ 36.05	$ -
Sep	1,066.44	730.00	336.44	$ 72.90	657.66	408.79	-	-	$ 24.73	$ -
Oct	616.54	390.00	226.54	$ 44.54	685.49	-	-	68.95	$ -	$ 4.45
Nov	343.94	343.94	-	$ 22.22	590.89	-	-	246.94	$ -	$ 15.95
Dec	359.68	359.68	-	$ 23.24	533.98	-	-	174.30	$ -	$ 11.26
Total	**8,222.82**	**6,069.97**	**2,152.86**	**$ 558.30**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 113.70**	**$ 117.54**
									Annual True Up Charge	$ (3.84)
			Total Annual Charge	**$ 558.30**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 558.30

Climate Zone 15 2700 SF Protoype **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	390.00	31.15	$ 27.85	668.94	-	-	247.78	$ -	$ 16.01
Feb	358.38	358.38	-	$ 23.15	649.89	-	-	291.51	$ -	$ 18.83
Mar	401.24	401.24	-	$ 24.27	870.03	-	-	468.79	$ -	$ 28.36
Apr	468.57	468.57	-	$ 28.35	942.97	-	-	474.40	$ -	$ 28.70
May	837.33	730.00	107.33	$ 53.33	960.37	-	-	123.04	$ -	$ 7.44
Jun	1,271.76	730.00	541.76	$ 90.43	921.21	350.55	-	-	$ 21.21	$ -
Jul	1,622.37	730.00	892.37	$ 120.37	907.02	715.35	-	-	$ 43.28	$ -
Aug	1,606.31	730.00	876.31	$ 119.00	914.53	691.79	-	-	$ 41.85	$ -
Sep	1,251.15	730.00	521.15	$ 88.67	781.09	470.05	-	-	$ 28.44	$ -
Oct	696.91	390.00	306.91	$ 51.40	814.15	-	-	117.25	$ -	$ 7.57
Nov	405.12	390.00	15.12	$ 26.49	701.79	-	-	296.67	$ -	$ 19.17
Dec	425.91	390.00	35.91	$ 28.26	634.21	-	-	208.30	$ -	$ 13.46
Total	**9,766.18**	**6,438.18**	**3,328.00**	**$ 681.59**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 134.78**	**$ 139.54**
									Annual True Up Charge	$ (4.76)
			Total Annual Charge	**$ 681.59**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 681.59

Climate Zone 15 45%/55% Weighted **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	390.00	3.35	$ 25.48	621.37	-	-	228.01	$ -	$ 14.73
Feb	334.62	334.62	-	$ 21.62	603.67	-	-	269.05	$ -	$ 17.38
Mar	371.32	371.32	-	$ 22.46	808.16	-	-	436.84	$ -	$ 26.43
Apr	426.48	426.48	-	$ 25.80	875.91	-	-	449.43	$ -	$ 27.19
May	767.25	730.00	37.25	$ 47.35	892.07	-	-	124.83	$ -	$ 7.55
Jun	1,172.74	730.00	442.74	$ 81.97	855.70	317.04	-	-	$ 19.18	$ -
Jul	1,505.32	730.00	775.32	$ 110.38	842.52	662.81	-	-	$ 40.10	$ -
Aug	1,498.13	730.00	768.13	$ 109.76	849.49	648.64	-	-	$ 39.24	$ -
Sep	1,168.03	730.00	438.03	$ 81.57	725.55	442.48	-	-	$ 26.77	$ -
Oct	660.74	390.00	270.74	$ 48.32	756.26	-	-	95.51	$ -	$ 6.17
Nov	377.59	377.59	-	$ 24.39	651.88	-	-	274.29	$ -	$ 17.72
Dec	396.10	390.00	6.10	$ 25.72	589.11	-	-	193.00	$ -	$ 12.47
Total	**9,071.67**	**6,330.01**	**2,741.66**	**$ 624.82**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 125.29**	**$ 129.64**
									Annual True Up Charge	$ (4.35)
			Total Annual Charge	**$ 624.82**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 624.82

2023 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	721	$ 0.0606	$ 0.0848
Winter (Jan - Feb; Oct - Dec)	385	$ 0.0647	$ 0.0848

Climate Zone 15 2100 SF Protoype **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 23.25	563.22	-	-	203.85	$ -	$ 13.19
Feb	305.58	305.58	-	$ 19.77	547.18	-	-	241.60	$ -	$ 15.63
Mar	334.76	334.76	-	$ 20.29	732.54	-	-	397.78	$ -	$ 24.11
Apr	375.05	375.05	-	$ 22.73	793.95	-	-	418.90	$ -	$ 25.39
May	681.59	681.59	-	$ 41.30	808.60	-	-	127.01	$ -	$ 7.70
Jun	1,051.71	721.00	330.71	$ 71.74	775.63	276.08	-	-	$ 16.73	$ -
Jul	1,362.26	721.00	641.26	$ 98.07	763.68	598.58	-	-	$ 36.27	$ -
Aug	1,365.90	721.00	644.90	$ 98.38	770.00	595.90	-	-	$ 36.11	$ -
Sep	1,066.44	721.00	345.44	$ 72.99	657.66	408.79	-	-	$ 24.77	$ -
Oct	616.54	385.00	231.54	$ 44.54	685.49	-	-	68.95	$ -	$ 4.46
Nov	343.94	343.94	-	$ 22.25	590.89	-	-	246.94	$ -	$ 15.98
Dec	359.68	359.68	-	$ 23.27	533.98	-	-	174.30	$ -	$ 11.28
Total	**8,222.82**	**6,028.97**	**2,193.86**	**$ 558.58**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 113.89**	**$ 117.72**
									Annual True Up Charge	$ (3.84)
			Total Annual Charge	**$ 558.58**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 558.58

Climate Zone 15 2700 SF Protoype **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	385.00	36.15	$ 27.98	668.94	-	-	247.78	$ -	$ 16.03
Feb	358.38	358.38	-	$ 23.19	649.89	-	-	291.51	$ -	$ 18.86
Mar	401.24	401.24	-	$ 24.31	870.03	-	-	468.79	$ -	$ 28.41
Apr	468.57	468.57	-	$ 28.40	942.97	-	-	474.40	$ -	$ 28.75
May	837.33	721.00	116.33	$ 53.56	960.37	-	-	123.04	$ -	$ 7.46
Jun	1,271.76	721.00	550.76	$ 90.40	921.21	350.55	-	-	$ 21.24	$ -
Jul	1,622.37	721.00	901.37	$ 120.13	907.02	715.35	-	-	$ 43.35	$ -
Aug	1,606.31	721.00	885.31	$ 118.77	914.53	691.79	-	-	$ 41.92	$ -
Sep	1,251.15	721.00	530.15	$ 88.65	781.09	470.05	-	-	$ 28.49	$ -
Oct	696.91	385.00	311.91	$ 51.36	814.15	-	-	117.25	$ -	$ 7.59
Nov	405.12	385.00	20.12	$ 26.62	701.79	-	-	296.67	$ -	$ 19.19
Dec	425.91	385.00	40.91	$ 28.38	634.21	-	-	208.30	$ -	$ 13.48
Total	**9,766.18**	**6,373.18**	**3,393.00**	**$ 681.72**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 135.00**	**$ 139.76**
									Annual True Up Charge	$ (4.76)
			Total Annual Charge	**$ 681.72**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 681.72

Climate Zone 15 45%/55% Weighted **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	385.00	8.35	$ 25.62	621.37	-	-	228.01	$ -	$ 14.75
Feb	334.62	334.62	-	$ 21.65	603.67	-	-	269.05	$ -	$ 17.41
Mar	371.32	371.32	-	$ 22.50	808.16	-	-	436.84	$ -	$ 26.47
Apr	426.48	426.48	-	$ 25.84	875.91	-	-	449.43	$ -	$ 27.24
May	767.25	721.00	46.25	$ 47.61	892.07	-	-	124.83	$ -	$ 7.56
Jun	1,172.74	721.00	451.74	$ 82.00	855.70	317.04	-	-	$ 19.21	$ -
Jul	1,505.32	721.00	784.32	$ 110.20	842.52	662.81	-	-	$ 40.17	$ -
Aug	1,498.13	721.00	777.13	$ 109.59	849.49	648.64	-	-	$ 39.31	$ -
Sep	1,168.03	721.00	447.03	$ 81.60	725.55	442.48	-	-	$ 26.81	$ -
Oct	660.74	385.00	275.74	$ 48.29	756.26	-	-	95.51	$ -	$ 6.18
Nov	377.59	377.59	-	$ 24.43	651.88	-	-	274.29	$ -	$ 17.75
Dec	396.10	385.00	11.10	$ 25.85	589.11	-	-	193.00	$ -	$ 12.49
Total	**9,071.67**	**6,270.01**	**2,801.66**	**$ 625.20**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 125.50**	**$ 129.85**
									Annual True Up Charge	$ (4.35)
			Total Annual Charge	**$ 625.20**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 625.20

2024 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	713	$ 0.0616	$ 0.0850
Winter (Jan - Feb; Oct - Dec)	381	$ 0.0657	$ 0.0850

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer				PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge		PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 23.61		563.22	-	-	203.85	$ -	$ 13.39
Feb	305.58	305.58	-	$ 20.08		547.18	-	-	241.60	$ -	$ 15.87
Mar	334.76	334.76	-	$ 20.62		732.54	-	-	397.78	$ -	$ 24.50
Apr	375.05	375.05	-	$ 23.10		793.95	-	-	418.90	$ -	$ 25.80
May	681.59	681.59	-	$ 41.99		808.60	-	-	127.01	$ -	$ 7.82
Jun	1,051.71	713.00	338.71	$ 72.71		775.63	276.08	-	-	$ 17.01	$ -
Jul	1,362.26	713.00	649.26	$ 99.11		763.68	598.58	-	-	$ 36.87	$ -
Aug	1,365.90	713.00	652.90	$ 99.42		770.00	595.90	-	-	$ 36.71	$ -
Sep	1,066.44	713.00	353.44	$ 73.96		657.66	408.79	-	-	$ 25.18	$ -
Oct	616.54	381.00	235.54	$ 45.05		685.49	-	-	68.95	$ -	$ 4.53
Nov	343.94	343.94	-	$ 22.60		590.89	-	-	246.94	$ -	$ 16.22
Dec	359.68	359.68	-	$ 23.63		533.98	-	-	174.30	$ -	$ 11.45
Total	**8,222.82**	**5,992.97**	**2,229.86**	**$ 565.88**		**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 115.77**	**$ 119.60**
										Annual True Up Charge	$ (3.84)
			Total Annual Charge	**$ 565.88**						Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 565.88

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer				PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge		PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	381.00	40.15	$ 28.44		668.94	-	-	247.78	$ -	$ 16.28
Feb	358.38	358.38	-	$ 23.55		649.89	-	-	291.51	$ -	$ 19.15
Mar	401.24	401.24	-	$ 24.72		870.03	-	-	468.79	$ -	$ 28.88
Apr	468.57	468.57	-	$ 28.86		942.97	-	-	474.40	$ -	$ 29.22
May	837.33	713.00	124.33	$ 54.49		960.37	-	-	123.04	$ -	$ 7.58
Jun	1,271.76	713.00	558.76	$ 91.42		921.21	350.55	-	-	$ 21.59	$ -
Jul	1,622.37	713.00	909.37	$ 121.22		907.02	715.35	-	-	$ 44.07	$ -
Aug	1,606.31	713.00	893.31	$ 119.85		914.53	691.79	-	-	$ 42.61	$ -
Sep	1,251.15	713.00	538.15	$ 89.66		781.09	470.05	-	-	$ 28.96	$ -
Oct	696.91	381.00	315.91	$ 51.88		814.15	-	-	117.25	$ -	$ 7.70
Nov	405.12	381.00	24.12	$ 27.08		701.79	-	-	296.67	$ -	$ 19.49
Dec	425.91	381.00	44.91	$ 28.85		634.21	-	-	208.30	$ -	$ 13.69
Total	**9,766.18**	**6,317.18**	**3,449.00**	**$ 690.02**		**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 137.23**	**$ 141.99**
										Annual True Up Charge	$ (4.76)
			Total Annual Charge	**$ 690.02**						Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 690.02

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer				PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge		PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	381.00	12.35	$ 26.08		621.37	-	-	228.01	$ -	$ 14.98
Feb	334.62	334.62	-	$ 21.98		603.67	-	-	269.05	$ -	$ 17.68
Mar	371.32	371.32	-	$ 22.87		808.16	-	-	436.84	$ -	$ 26.91
Apr	426.48	426.48	-	$ 26.27		875.91	-	-	449.43	$ -	$ 27.68
May	767.25	713.00	54.25	$ 48.53		892.07	-	-	124.83	$ -	$ 7.69
Jun	1,172.74	713.00	459.74	$ 83.00		855.70	317.04	-	-	$ 19.53	$ -
Jul	1,505.32	713.00	792.32	$ 111.27		842.52	662.81	-	-	$ 40.83	$ -
Aug	1,498.13	713.00	785.13	$ 110.66		849.49	648.64	-	-	$ 39.96	$ -
Sep	1,168.03	713.00	455.03	$ 82.60		725.55	442.48	-	-	$ 27.26	$ -
Oct	660.74	381.00	279.74	$ 48.81		756.26	-	-	95.51	$ -	$ 6.28
Nov	377.59	377.59	-	$ 24.81		651.88	-	-	274.29	$ -	$ 18.02
Dec	396.10	381.00	15.10	$ 26.32		589.11	-	-	193.00	$ -	$ 12.68
Total	**9,071.67**	**6,218.01**	**2,853.66**	**$ 633.20**		**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 127.57**	**$ 131.92**
										Annual True Up Charge	$ (4.35)
			Total Annual Charge	**$ 633.20**						Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 633.20

2025 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	704	$ 0.0626	$ 0.0853
Winter (Jan - Feb; Oct - Dec)	376	$ 0.0667	$ 0.0853

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 23.97	563.22	-	-	203.85	$ -	$ 13.60
Feb	305.58	305.58	-	$ 20.38	547.18	-	-	241.60	$ -	$ 16.12
Mar	334.76	334.76	-	$ 20.96	732.54	-	-	397.78	$ -	$ 24.90
Apr	375.05	375.05	-	$ 23.48	793.95	-	-	418.90	$ -	$ 26.22
May	681.59	681.59	-	$ 42.67	808.60	-	-	127.01	$ -	$ 7.95
Jun	1,051.71	704.00	347.71	$ 73.73	775.63	276.08	-	-	$ 17.28	$ -
Jul	1,362.26	704.00	658.26	$ 100.22	763.68	598.58	-	-	$ 37.47	$ -
Aug	1,365.90	704.00	661.90	$ 100.53	770.00	595.90	-	-	$ 37.30	$ -
Sep	1,066.44	704.00	362.44	$ 74.99	657.66	408.79	-	-	$ 25.59	$ -
Oct	616.54	376.00	240.54	$ 45.60	685.49	-	-	68.95	$ -	$ 4.60
Nov	343.94	343.94	-	$ 22.94	590.89	-	-	246.94	$ -	$ 16.47
Dec	359.68	359.68	-	$ 23.99	533.98	-	-	174.30	$ -	$ 11.63
Total	**8,222.82**	**5,951.97**	**2,270.86**	**$ 573.45**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 117.65**	**$ 121.48**
									Annual True Up Charge	$ (3.84)
			Total Annual Charge	**$ 573.45**					Total Annual Charge	**$ -**
				Annual Cost Savings with PV	$ 573.45					

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	376.00	45.15	$ 28.93	668.94	-	-	247.78	$ -	$ 16.53
Feb	358.38	358.38	-	$ 23.90	649.89	-	-	291.51	$ -	$ 19.44
Mar	401.24	401.24	-	$ 25.12	870.03	-	-	468.79	$ -	$ 29.35
Apr	468.57	468.57	-	$ 29.33	942.97	-	-	474.40	$ -	$ 29.70
May	837.33	704.00	133.33	$ 55.44	960.37	-	-	123.04	$ -	$ 7.70
Jun	1,271.76	704.00	567.76	$ 92.50	921.21	350.55	-	-	$ 21.94	$ -
Jul	1,622.37	704.00	918.37	$ 122.41	907.02	715.35	-	-	$ 44.78	$ -
Aug	1,606.31	704.00	902.31	$ 121.04	914.53	691.79	-	-	$ 43.31	$ -
Sep	1,251.15	704.00	547.15	$ 90.74	781.09	470.05	-	-	$ 29.43	$ -
Oct	696.91	376.00	320.91	$ 52.45	814.15	-	-	117.25	$ -	$ 7.82
Nov	405.12	376.00	29.12	$ 27.56	701.79	-	-	296.67	$ -	$ 19.79
Dec	425.91	376.00	49.91	$ 29.34	634.21	-	-	208.30	$ -	$ 13.89
Total	**9,766.18**	**6,252.18**	**3,514.00**	**$ 698.77**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 139.46**	**$ 144.22**
									Annual True Up Charge	$ (4.76)
			Total Annual Charge	**$ 698.77**					Total Annual Charge	**$ -**
				Annual Cost Savings with PV	$ 698.77					

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	376.00	17.35	$ 26.56	621.37	-	-	228.01	$ -	$ 15.21
Feb	334.62	334.62	-	$ 22.32	603.67	-	-	269.05	$ -	$ 17.95
Mar	371.32	371.32	-	$ 23.24	808.16	-	-	436.84	$ -	$ 27.35
Apr	426.48	426.48	-	$ 26.70	875.91	-	-	449.43	$ -	$ 28.13
May	767.25	704.00	63.25	$ 49.47	892.07	-	-	124.83	$ -	$ 7.81
Jun	1,172.74	704.00	468.74	$ 84.05	855.70	317.04	-	-	$ 19.85	$ -
Jul	1,505.32	704.00	801.32	$ 112.42	842.52	662.81	-	-	$ 41.49	$ -
Aug	1,498.13	704.00	794.13	$ 111.81	849.49	648.64	-	-	$ 40.60	$ -
Sep	1,168.03	704.00	464.03	$ 83.65	725.55	442.48	-	-	$ 27.70	$ -
Oct	660.74	376.00	284.74	$ 49.37	756.26	-	-	95.51	$ -	$ 6.37
Nov	377.59	376.00	1.59	$ 25.21	651.88	-	-	274.29	$ -	$ 18.30
Dec	396.10	376.00	20.10	$ 26.79	589.11	-	-	193.00	$ -	$ 12.87
Total	**9,071.67**	**6,156.42**	**2,915.25**	**$ 641.60**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 129.64**	**$ 133.99**
									Annual True Up Charge	$ (4.35)
			Total Annual Charge	**$ 641.60**					Total Annual Charge	**$ -**
				Annual Cost Savings with PV	**$ 641.60**					

2026 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	696	$ 0.0636	$ 0.0855
Winter (Jan - Feb; Oct - Dec)	372	$ 0.0667	$ 0.0855

Climate Zone 15 2100 SF Protoype **PV Size (kW)** **4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 23.97	563.22	-	-	203.85	$ -	$ 13.60
Feb	305.58	305.58	-	$ 20.38	547.18	-	-	241.60	$ -	$ 16.12
Mar	334.76	334.76	-	$ 21.29	732.54	-	-	397.78	$ -	$ 25.30
Apr	375.05	375.05	-	$ 23.85	793.95	-	-	418.90	$ -	$ 26.64
May	681.59	681.59	-	$ 43.35	808.60	-	-	127.01	$ -	$ 8.08
Jun	1,051.71	696.00	355.71	$ 74.68	775.63	276.08	-	-	$ 17.56	$ -
Jul	1,362.26	696.00	666.26	$ 101.23	763.68	598.58	-	-	$ 38.07	$ -
Aug	1,365.90	696.00	669.90	$ 101.54	770.00	595.90	-	-	$ 37.90	$ -
Sep	1,066.44	696.00	370.44	$ 75.94	657.66	408.79	-	-	$ 26.00	$ -
Oct	616.54	372.00	244.54	$ 45.72	685.49	-	-	68.95	$ -	$ 4.60
Nov	343.94	343.94	-	$ 22.94	590.89	-	-	246.94	$ -	$ 16.47
Dec	359.68	359.68	-	$ 23.99	533.98	-	-	174.30	$ -	$ 11.63
Total	**8,222.82**	**5,915.97**	**2,306.86**	**$ 578.89**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 119.53**	**$ 122.43**
									Annual True Up Charge	$ (2.90)
			Total Annual Charge	**$ 578.89**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 578.89

Climate Zone 15 2700 SF Protoype **PV Size (kW)** **5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	372.00	49.15	$ 29.02	668.94	-	-	247.78	$ -	$ 16.53
Feb	358.38	358.38	-	$ 23.90	649.89	-	-	291.51	$ -	$ 19.44
Mar	401.24	401.24	-	$ 25.52	870.03	-	-	468.79	$ -	$ 29.82
Apr	468.57	468.57	-	$ 29.80	942.97	-	-	474.40	$ -	$ 30.17
May	837.33	696.00	141.33	$ 56.35	960.37	-	-	123.04	$ -	$ 7.83
Jun	1,271.76	696.00	575.76	$ 93.49	921.21	350.55	-	-	$ 22.30	$ -
Jul	1,622.37	696.00	926.37	$ 123.47	907.02	715.35	-	-	$ 45.50	$ -
Aug	1,606.31	696.00	910.31	$ 122.10	914.53	691.79	-	-	$ 44.00	$ -
Sep	1,251.15	696.00	555.15	$ 91.73	781.09	470.05	-	-	$ 29.90	$ -
Oct	696.91	372.00	324.91	$ 52.59	814.15	-	-	117.25	$ -	$ 7.82
Nov	405.12	372.00	33.12	$ 27.64	701.79	-	-	296.67	$ -	$ 19.79
Dec	425.91	372.00	53.91	$ 29.42	634.21	-	-	208.30	$ -	$ 13.89
Total	**9,766.18**	**6,196.18**	**3,570.00**	**$ 705.04**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 141.68**	**$ 145.29**
									Annual True Up Charge	$ (3.60)
			Total Annual Charge	**$ 705.04**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 705.04

Climate Zone 15 45%/55% Weighted **PV Size (kW)** **5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	372.00	21.35	$ 26.64	621.37	-	-	228.01	$ -	$ 15.21
Feb	334.62	334.62	-	$ 22.32	603.67	-	-	269.05	$ -	$ 17.95
Mar	371.32	371.32	-	$ 23.62	808.16	-	-	436.84	$ -	$ 27.78
Apr	426.48	426.48	-	$ 27.12	875.91	-	-	449.43	$ -	$ 28.58
May	767.25	696.00	71.25	$ 50.36	892.07	-	-	124.83	$ -	$ 7.94
Jun	1,172.74	696.00	476.74	$ 85.03	855.70	317.04	-	-	$ 20.16	$ -
Jul	1,505.32	696.00	809.32	$ 113.46	842.52	662.81	-	-	$ 42.15	$ -
Aug	1,498.13	696.00	802.13	$ 112.85	849.49	648.64	-	-	$ 41.25	$ -
Sep	1,168.03	696.00	472.03	$ 84.62	725.55	442.48	-	-	$ 28.14	$ -
Oct	660.74	372.00	288.74	$ 49.50	756.26	-	-	95.51	$ -	$ 6.37
Nov	377.59	372.00	5.59	$ 25.29	651.88	-	-	274.29	$ -	$ 18.30
Dec	396.10	372.00	24.10	$ 26.87	589.11	-	-	193.00	$ -	$ 12.87
Total	**9,071.67**	**6,100.42**	**2,971.25**	**$ 647.68**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 131.71**	**$ 135.00**
									Annual True Up Charge	$ (3.29)
			Total Annual Charge	**$ 647.68**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 647.68

2027 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	688	$ 0.0648	$ 0.0858
Winter (Jan - Feb; Oct - Dec)	367	$ 0.0687	$ 0.0858

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 24.69	563.22	-	-	203.85	$ -	$ 14.00
Feb	305.58	305.58	-	$ 20.99	547.18	-	-	241.60	$ -	$ 16.60
Mar	334.76	334.76	-	$ 21.69	732.54	-	-	397.78	$ -	$ 25.78
Apr	375.05	375.05	-	$ 24.30	793.95	-	-	418.90	$ -	$ 27.14
May	681.59	681.59	-	$ 44.17	808.60	-	-	127.01	$ -	$ 8.23
Jun	1,051.71	688.00	363.71	$ 75.79	775.63	276.08	-	-	$ 17.89	$ -
Jul	1,362.26	688.00	674.26	$ 102.43	763.68	598.58	-	-	$ 38.79	$ -
Aug	1,365.90	688.00	677.90	$ 102.75	770.00	595.90	-	-	$ 38.61	$ -
Sep	1,066.44	688.00	378.44	$ 77.05	657.66	408.79	-	-	$ 26.49	$ -
Oct	616.54	367.00	249.54	$ 46.62	685.49	-	-	68.95	$ -	$ 4.74
Nov	343.94	343.94	-	$ 23.63	590.89	-	-	246.94	$ -	$ 16.96
Dec	359.68	359.68	-	$ 24.71	533.98	-	-	174.30	$ -	$ 11.97
Total	**8,222.82**	**5,878.97**	**2,343.86**	**$ 588.83**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 121.78**	**$ 125.43**
									Annual True Up Charge	$ (3.65)
			Total Annual Charge	**$ 588.83**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 588.83

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	367.00	54.15	$ 29.86	668.94	-	-	247.78	$ -	$ 17.02
Feb	358.38	358.38	-	$ 24.62	649.89	-	-	291.51	$ -	$ 20.03
Mar	401.24	401.24	-	$ 26.00	870.03	-	-	468.79	$ -	$ 30.38
Apr	468.57	468.57	-	$ 30.36	942.97	-	-	474.40	$ -	$ 30.74
May	837.33	688.00	149.33	$ 57.39	960.37	-	-	123.04	$ -	$ 7.97
Jun	1,271.76	688.00	583.76	$ 94.67	921.21	350.55	-	-	$ 22.72	$ -
Jul	1,622.37	688.00	934.37	$ 124.75	907.02	715.35	-	-	$ 46.35	$ -
Aug	1,606.31	688.00	918.31	$ 123.37	914.53	691.79	-	-	$ 44.83	$ -
Sep	1,251.15	688.00	563.15	$ 92.90	781.09	470.05	-	-	$ 30.46	$ -
Oct	696.91	367.00	329.91	$ 53.52	814.15	-	-	117.25	$ -	$ 8.05
Nov	405.12	367.00	38.12	$ 28.48	701.79	-	-	296.67	$ -	$ 20.38
Dec	425.91	367.00	58.91	$ 30.27	634.21	-	-	208.30	$ -	$ 14.31
Total	**9,766.18**	**6,136.18**	**3,630.00**	**$ 716.20**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 144.36**	**$ 148.89**
									Annual True Up Charge	$ (4.53)
			Total Annual Charge	**$ 716.20**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 716.20

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	367.00	26.35	$ 27.47	621.37	-	-	228.01	$ -	$ 15.66
Feb	334.62	334.62	-	$ 22.99	603.67	-	-	269.05	$ -	$ 18.48
Mar	371.32	371.32	-	$ 24.06	808.16	-	-	436.84	$ -	$ 28.31
Apr	426.48	426.48	-	$ 27.64	875.91	-	-	449.43	$ -	$ 29.12
May	767.25	688.00	79.25	$ 51.38	892.07	-	-	124.83	$ -	$ 8.09
Jun	1,172.74	688.00	484.74	$ 86.17	855.70	317.04	-	-	$ 20.54	$ -
Jul	1,505.32	688.00	817.32	$ 114.71	842.52	662.81	-	-	$ 42.95	$ -
Aug	1,498.13	688.00	810.13	$ 114.09	849.49	648.64	-	-	$ 42.03	$ -
Sep	1,168.03	688.00	480.03	$ 85.77	725.55	442.48	-	-	$ 28.67	$ -
Oct	660.74	367.00	293.74	$ 50.42	756.26	-	-	95.51	$ -	$ 6.56
Nov	377.59	367.00	10.59	$ 26.12	651.88	-	-	274.29	$ -	$ 18.84
Dec	396.10	367.00	29.10	$ 27.71	589.11	-	-	193.00	$ -	$ 13.26
Total	**9,071.67**	**6,040.42**	**3,031.25**	**$ 658.53**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 134.20**	**$ 138.33**
									Annual True Up Charge	$ (4.13)
			Total Annual Charge	**$ 658.53**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 658.53

2028 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	680	$ 0.0659	$ 0.0860
Winter (Jan - Feb; Oct - Dec)	363	$ 0.0698	$ 0.0860

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer			PV Customer						
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.37	-	$ 25.08	563.22	-	-	203.85	$ -	$ 14.23
Feb	305.58	305.58	-	$ 21.33	547.18	-	-	241.60	$ -	$ 16.86
Mar	334.76	334.76	-	$ 22.06	732.54	-	-	397.78	$ -	$ 26.21
Apr	375.05	375.05	-	$ 24.72	793.95	-	-	418.90	$ -	$ 27.61
May	681.59	680.00	1.59	$ 44.95	808.60	-	-	127.01	$ -	$ 8.37
Jun	1,051.71	680.00	371.71	$ 76.78	775.63	276.08	-	-	$ 18.19	$ -
Jul	1,362.26	680.00	682.26	$ 103.49	763.68	598.58	-	-	$ 39.45	$ -
Aug	1,365.90	680.00	685.90	$ 103.80	770.00	595.90	-	-	$ 39.27	$ -
Sep	1,066.44	680.00	386.44	$ 78.05	657.66	408.79	-	-	$ 26.94	$ -
Oct	616.54	363.00	253.54	$ 47.14	685.49	-	-	68.95	$ -	$ 4.81
Nov	343.94	343.94	-	$ 24.01	590.89	-	-	246.94	$ -	$ 17.24
Dec	359.68	359.68	-	$ 25.11	533.98	-	-	174.30	$ -	$ 12.17
Total	**8,222.82**	**5,841.38**	**2,381.45**	**$ 596.50**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 123.85**	**$ 127.50**
									Annual True Up Charge	$ (3.65)
			Total Annual Charge	**$ 596.50**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 596.50

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer			PV Customer						
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	363.00	58.15	$ 30.34	668.94	-	-	247.78	$ -	$ 17.30
Feb	358.38	358.38	-	$ 25.01	649.89	-	-	291.51	$ -	$ 20.35
Mar	401.24	401.24	-	$ 26.44	870.03	-	-	468.79	$ -	$ 30.89
Apr	468.57	468.57	-	$ 30.88	942.97	-	-	474.40	$ -	$ 31.26
May	837.33	680.00	157.33	$ 58.34	960.37	-	-	123.04	$ -	$ 8.11
Jun	1,271.76	680.00	591.76	$ 95.70	921.21	350.55	-	-	$ 23.10	$ -
Jul	1,622.37	680.00	942.37	$ 125.86	907.02	715.35	-	-	$ 47.14	$ -
Aug	1,606.31	680.00	926.31	$ 124.47	914.53	691.79	-	-	$ 45.59	$ -
Sep	1,251.15	680.00	571.15	$ 93.93	781.09	470.05	-	-	$ 30.98	$ -
Oct	696.91	363.00	333.91	$ 54.05	814.15	-	-	117.25	$ -	$ 8.18
Nov	405.12	363.00	42.12	$ 28.96	701.79	-	-	296.67	$ -	$ 20.71
Dec	425.91	363.00	62.91	$ 30.75	634.21	-	-	208.30	$ -	$ 14.54
Total	**9,766.18**	**6,080.18**	**3,686.00**	**$ 724.74**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 146.81**	**$ 151.34**
									Annual True Up Charge	$ (4.53)
			Total Annual Charge	**$ 724.74**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 724.74

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer			PV Customer						
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	363.00	30.35	$ 27.95	621.37	-	-	228.01	$ -	$ 15.92
Feb	334.62	334.62	-	$ 23.36	603.67	-	-	269.05	$ -	$ 18.78
Mar	371.32	371.32	-	$ 24.47	808.16	-	-	436.84	$ -	$ 28.79
Apr	426.48	426.48	-	$ 28.11	875.91	-	-	449.43	$ -	$ 29.62
May	767.25	680.00	87.25	$ 52.32	892.07	-	-	124.83	$ -	$ 8.23
Jun	1,172.74	680.00	492.74	$ 87.19	855.70	317.04	-	-	$ 20.89	$ -
Jul	1,505.32	680.00	825.32	$ 115.79	842.52	662.81	-	-	$ 43.68	$ -
Aug	1,498.13	680.00	818.13	$ 115.17	849.49	648.64	-	-	$ 42.75	$ -
Sep	1,168.03	680.00	488.03	$ 86.78	725.55	442.48	-	-	$ 29.16	$ -
Oct	660.74	363.00	297.74	$ 50.94	756.26	-	-	95.51	$ -	$ 6.67
Nov	377.59	363.00	14.59	$ 26.59	651.88	-	-	274.29	$ -	$ 19.15
Dec	396.10	363.00	33.10	$ 28.18	589.11	-	-	193.00	$ -	$ 13.47
Total	**9,071.67**	**5,984.42**	**3,087.25**	**$ 666.84**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 136.48**	**$ 140.61**
									Annual True Up Charge	$ (4.13)
			Total Annual Charge	**$ 666.84**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 666.84

2029 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	672	$ 0.0671	$ 0.0863
Winter (Jan - Feb; Oct - Dec)	359	$ 0.0710	$ 0.0863

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	359.00	0.37	$ 25.52	563.22	-	-	203.85	$ -	$ 14.47
Feb	305.58	305.58	-	$ 21.70	547.18	-	-	241.60	$ -	$ 17.15
Mar	334.76	334.76	-	$ 22.46	732.54	-	-	397.78	$ -	$ 26.69
Apr	375.05	375.05	-	$ 25.17	793.95	-	-	418.90	$ -	$ 28.11
May	681.59	672.00	9.59	$ 45.92	808.60	-	-	127.01	$ -	$ 8.52
Jun	1,051.71	672.00	379.71	$ 77.86	775.63	276.08	-	-	$ 18.52	$ -
Jul	1,362.26	672.00	690.26	$ 104.66	763.68	598.58	-	-	$ 40.16	$ -
Aug	1,365.90	672.00	693.90	$ 104.97	770.00	595.90	-	-	$ 39.98	$ -
Sep	1,066.44	672.00	394.44	$ 79.13	657.66	408.79	-	-	$ 27.43	$ -
Oct	616.54	359.00	257.54	$ 47.72	685.49	-	-	68.95	$ -	$ 4.90
Nov	343.94	343.94	-	$ 24.42	590.89	-	-	246.94	$ -	$ 17.53
Dec	359.68	359.00	0.68	$ 25.55	533.98	-	-	174.30	$ -	$ 12.38
Total	**8,222.82**	**5,796.33**	**2,426.50**	**$ 605.07**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 126.10**	**$ 129.75**
									Annual True Up Charge	$ (3.65)
			Total Annual Charge	**$ 605.07**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 605.07

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	359.00	62.15	$ 30.85	668.94	-	-	247.78	$ -	$ 17.59
Feb	358.38	358.38	-	$ 25.44	649.89	-	-	291.51	$ -	$ 20.70
Mar	401.24	401.24	-	$ 26.92	870.03	-	-	468.79	$ -	$ 31.46
Apr	468.57	468.57	-	$ 31.44	942.97	-	-	474.40	$ -	$ 31.83
May	837.33	672.00	165.33	$ 59.36	960.37	-	-	123.04	$ -	$ 8.26
Jun	1,271.76	672.00	599.76	$ 96.85	921.21	350.55	-	-	$ 23.52	$ -
Jul	1,622.37	672.00	950.37	$ 127.11	907.02	715.35	-	-	$ 48.00	$ -
Aug	1,606.31	672.00	934.31	$ 125.72	914.53	691.79	-	-	$ 46.42	$ -
Sep	1,251.15	672.00	579.15	$ 95.07	781.09	470.05	-	-	$ 31.54	$ -
Oct	696.91	359.00	337.91	$ 54.65	814.15	-	-	117.25	$ -	$ 8.32
Nov	405.12	359.00	46.12	$ 29.47	701.79	-	-	296.67	$ -	$ 21.06
Dec	425.91	359.00	66.91	$ 31.26	634.21	-	-	208.30	$ -	$ 14.79
Total	**9,766.18**	**6,024.18**	**3,742.00**	**$ 734.16**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 149.48**	**$ 154.01**
									Annual True Up Charge	$ (4.53)
			Total Annual Charge	**$ 734.16**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 734.16

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	359.00	34.35	$ 28.45	621.37	-	-	228.01	$ -	$ 16.19
Feb	334.62	334.62	-	$ 23.76	603.67	-	-	269.05	$ -	$ 19.10
Mar	371.32	371.32	-	$ 24.92	808.16	-	-	436.84	$ -	$ 29.31
Apr	426.48	426.48	-	$ 28.62	875.91	-	-	449.43	$ -	$ 30.16
May	767.25	672.00	95.25	$ 53.31	892.07	-	-	124.83	$ -	$ 8.38
Jun	1,172.74	672.00	500.74	$ 88.30	855.70	317.04	-	-	$ 21.27	$ -
Jul	1,505.32	672.00	833.32	$ 117.01	842.52	662.81	-	-	$ 44.47	$ -
Aug	1,498.13	672.00	826.13	$ 116.39	849.49	648.64	-	-	$ 43.52	$ -
Sep	1,168.03	672.00	496.03	$ 87.90	725.55	442.48	-	-	$ 29.69	$ -
Oct	660.74	359.00	301.74	$ 51.53	756.26	-	-	95.51	$ -	$ 6.78
Nov	377.59	359.00	18.59	$ 27.09	651.88	-	-	274.29	$ -	$ 19.47
Dec	396.10	359.00	37.10	$ 28.69	589.11	-	-	193.00	$ -	$ 13.70
Total	**9,071.67**	**5,928.42**	**3,143.25**	**$ 675.96**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 138.96**	**$ 143.10**
									Annual True Up Charge	$ (4.13)
			Total Annual Charge	**$ 675.96**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 675.96

2030 Energy Cost Savings

Rate Schedule	Hydro Allotment (kWh)	Hydro Rate	Over Hydro Rate
Summer (Mar - Sep)	664	$ 0.0684	$ 0.0866
Winter (Jan - Feb; Oct - Dec)	354	$ 0.0721	$ 0.0866

Climate Zone 15 2100 SF Protoype — **PV Size (kW) 4.91**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	359.37	354.00	5.37	$ 25.99	563.22	-	-	203.85	$ -	$ 14.70
Feb	305.58	305.58	-	$ 22.03	547.18	-	-	241.60	$ -	$ 17.42
Mar	334.76	334.76	-	$ 22.90	732.54	-	-	397.78	$ -	$ 27.21
Apr	375.05	375.05	-	$ 25.65	793.95	-	-	418.90	$ -	$ 28.65
May	681.59	664.00	17.59	$ 46.94	808.60	-	-	127.01	$ -	$ 8.69
Jun	1,051.71	664.00	387.71	$ 78.99	775.63	276.08	-	-	$ 18.88	$ -
Jul	1,362.26	664.00	698.26	$ 105.89	763.68	598.58	-	-	$ 40.94	$ -
Aug	1,365.90	664.00	701.90	$ 106.20	770.00	595.90	-	-	$ 40.76	$ -
Sep	1,066.44	664.00	402.44	$ 80.27	657.66	408.79	-	-	$ 27.96	$ -
Oct	616.54	354.00	262.54	$ 48.26	685.49	-	-	68.95	$ -	$ 4.97
Nov	343.94	343.94	-	$ 24.80	590.89	-	-	246.94	$ -	$ 17.80
Dec	359.68	354.00	5.68	$ 26.02	533.98	-	-	174.30	$ -	$ 12.57
Total	**8,222.82**	**5,741.33**	**2,481.50**	**$ 613.94**	**8,222.82**	**1,879.35**	**-**	**1,879.35**	**$ 128.55**	**$ 132.01**
									Annual True Up Charge	$ (3.46)
			Total Annual Charge	**$ 613.94**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 613.94

Climate Zone 15 2700 SF Protoype — **PV Size (kW) 5.84**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	421.15	354.00	67.15	$ 31.34	668.94	-	-	247.78	$ -	$ 17.87
Feb	358.38	354.00	4.38	$ 25.90	649.89	-	-	291.51	$ -	$ 21.02
Mar	401.24	401.24	-	$ 27.44	870.03	-	-	468.79	$ -	$ 32.07
Apr	468.57	468.57	-	$ 32.05	942.97	-	-	474.40	$ -	$ 32.45
May	837.33	664.00	173.33	$ 60.43	960.37	-	-	123.04	$ -	$ 8.42
Jun	1,271.76	664.00	607.76	$ 98.05	921.21	350.55	-	-	$ 23.98	$ -
Jul	1,622.37	664.00	958.37	$ 128.41	907.02	715.35	-	-	$ 48.93	$ -
Aug	1,606.31	664.00	942.31	$ 127.02	914.53	691.79	-	-	$ 47.32	$ -
Sep	1,251.15	664.00	587.15	$ 96.26	781.09	470.05	-	-	$ 32.15	$ -
Oct	696.91	354.00	342.91	$ 55.22	814.15	-	-	117.25	$ -	$ 8.45
Nov	405.12	354.00	51.12	$ 29.95	701.79	-	-	296.67	$ -	$ 21.39
Dec	425.91	354.00	71.91	$ 31.75	634.21	-	-	208.30	$ -	$ 15.02
Total	**9,766.18**	**5,959.80**	**3,806.38**	**$ 743.83**	**9,766.18**	**2,227.74**	**-**	**2,227.74**	**$ 152.38**	**$ 156.68**
									Annual True Up Charge	$ (4.30)
			Total Annual Charge	**$ 743.83**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 743.83

Climate Zone 15 45%/55% Weighted — **PV Size (kW) 5.42**

		No PV Customer			PV Customer					
Month	Load (kWh)	Consumption Hydro (kWh)	Consumption Over Hydro (kWh)	Energy Charge	PV Production (kWh)	Net Consumption Hydro (kWh)	Net Consumption Over Hydro (kWh)	PV Exports (kWh)	Energy Charge	Export Credit
Jan	393.35	354.00	39.35	$ 28.93	621.37	-	-	228.01	$ -	$ 16.44
Feb	334.62	334.62	-	$ 24.13	603.67	-	-	269.05	$ -	$ 19.40
Mar	371.32	371.32	-	$ 25.40	808.16	-	-	436.84	$ -	$ 29.88
Apr	426.48	426.48	-	$ 29.17	875.91	-	-	449.43	$ -	$ 30.74
May	767.25	664.00	103.25	$ 54.36	892.07	-	-	124.83	$ -	$ 8.54
Jun	1,172.74	664.00	508.74	$ 89.47	855.70	317.04	-	-	$ 21.69	$ -
Jul	1,505.32	664.00	841.32	$ 118.28	842.52	662.81	-	-	$ 45.34	$ -
Aug	1,498.13	664.00	834.13	$ 117.65	849.49	648.64	-	-	$ 44.37	$ -
Sep	1,168.03	664.00	504.03	$ 89.07	725.55	442.48	-	-	$ 30.27	$ -
Oct	660.74	354.00	306.74	$ 52.09	756.26	-	-	95.51	$ -	$ 6.89
Nov	377.59	354.00	23.59	$ 27.57	651.88	-	-	274.29	$ -	$ 19.78
Dec	396.10	354.00	42.10	$ 29.17	589.11	-	-	193.00	$ -	$ 13.92
Total	**9,071.67**	**5,868.42**	**3,203.25**	**$ 685.28**	**9,071.67**	**2,070.97**	**-**	**2,070.97**	**$ 141.65**	**$ 145.58**
									Annual True Up Charge	$ (3.92)
			Total Annual Charge	**$ 685.28**					Total Annual Charge	**$ -**

Annual Cost Savings with PV $ 685.28

APPENDIX C:
Needles PV Determination Application

1. Signed Resolution Requesting a PV Requirement Determination
2. Cover Letter
3. Residential Energy Rate Schedule
4. Electric Rate Calculation Template
5. PV Interconnection Agreement

RESOLUTION NO. 2019- 51

A RESOLUTION OF THE CITY OF NEEDLES, CALIFORNIA, REQUESTING A COST-EFFECTIVENESS DETERMINATION BY THE CALIFORNIA ENERGY COMMISSION PURSUANT TO SECTION 10-109(k) OF THE 2019 ENERGY CODE

WHEREAS, the California Energy Commission updated the California Code of Regulations, Title 24, Part 6, known as the Building Energy Efficiency Standards (Standards);

WHEREAS, Section 150.1(c)14 of the Standards now requires the installation of solar photovoltaics (PV) for all low-rise residential buildings, which includes all new multifamily homes of three stories or less and all new single-family homes;

WHEREAS, Section 10-109(k) of the administrative regulations associated with the Standards provides a process whereby the California Energy Commission can determine that the solar PV requirements are not cost-effective and should not apply within a service area;

WHEREAS, the City of Needles held a public hearing as required by Section 10-109(k);

WHEREAS, the City of Needles requests a determination from the California Energy Commission that Section 150.1(c)14 is not cost-effective and should not apply within the City of Needles service area;

WHEREAS, the request for a determination would still allow anyone within Needles' service area to add solar PV to new or existing buildings at their discretion;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Needles, California hereby approves Resolution No. 2019-51 requesting a cost-effectiveness determination by the California Energy Commission pursuant to Section 10-109(k) of the 2019 Energy Code.

PASSED, APPROVED AND ADOPTED at a regular meeting of the City Council of the City of Needles, California, held on the 13th day of August, 2019, by the following roll call vote:

AYES: Councilmembers Gudmundson, Terral, Paget, Belt and Longacre

NOES: None

ABSENT: Councilmember Hazlewood

ABSTAIN: None

Mayor

(SEAL)

ATTEST: _____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

City of Needles

817 Third Street • Needles, California 92363
(760) 326-2113 • FAX (760) 326-6765
www.cityofneedles.com

July 2, 2019

Maziar Shirakh, P.E.
Senior Engineer, Building Energy Efficiency Standards
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512
Maziar.Shirakh@energy.ca.gov

Re: City of Needles' Request for a Residential Photovoltaic Determination

Dear Mr. Shirakh,

On behalf of the City of Needles ("City" or "Needles"), I am writing to seek a determination from the California Energy Commission ("Commission") under Section 10-109(k) of the 2019 Energy Code. Section 10-109(k) allows the Commission to determine that the photovoltaic ("PV") requirements of Section 150.1(c)14 should not apply, if the Commission finds that "the implementation of public agency rules regarding utility system costs and revenue requirements, compensation for customer-owned generation, or interconnection fees, causes the Commission's cost effectiveness conclusions to not hold for particular buildings."

The City of Needles is a small community of roughly 5,000 residents nestled on the eastern edge of California, touching Arizona and a short distance from Nevada. Needles provides electric service to its residents through Needles Public Utility Authority ("NPUA"). The median household income is $31,372, making Needles a severely disadvantaged community. Currently, very few new houses (approximately 2-3) are built in Needles each year; residents' economic condition likely contributes to this lack of new development. Adding the residential PV requirement in this community may worsen Needles already precarious position.

Importantly, the residential PV requirement is not cost-effective for Needles' citizens. While Needles electric rates fluctuate based on the season and customer consumption, they are some of the lowest in the state. For example, this summer an NPUA customer will receive hydropower for the first 742 kWhs at a rate of $0.0621/kWh. When they exceed this amount, the price increases to an "over hydro" rate of 0.0917/kWh. For the typical residential electric customer, we believe that the Section 150.1(c)14 mandate is not cost-effective within Needles' service area and a determination under Section 10-109(k) is appropriate.

NPUA reviewed and approved this application for a determination from the Commission. Needles then held a public meeting and received public comment on the submission of this request for a determination regarding the cost-effectiveness of the PV requirement, and the city council approved this action. The City of Needles respectfully requests that the California Energy Commission make a determination under Section 10-109(k) of the 2019 Energy Code that the photovoltaic requirements of Section 150.1(c)14 do not apply within Needles' service area.

Sincerely,

Rick Daniels
City of Needles, City Manager
rdaniels@cityofneed

Cc (email only): Rebecca Westmore
Bill Pennington
Christopher Meyer
Danny Tam

Electric Rates – Effective October 1, 2018 (Rates were calculated using CPI of 3.2%)

Winter Rates – October 1 thru February 28

Basic Service Charge	$29.82
Hydro Allotment **406 KWH**	.0652
Over Hydro	.0917
CA Conservation Charge	.0033
Utility Users Tax	2.5%

Summer Rates – March 1 – October 30

Basic Service Charge	$29.82
Hydro Allotment **742 KWH**	.0621
Over Hydro	.0917
CA Conservation Charge	.0033
Utility Users Tax	2.5%

Electric Rates – Effective October 1, 2017 (Rates were calculated using CPI of 2%)

Winter Rates – October 1 thru February 2018

Basic Service Charge	$28.90
Hydro Allotment 414 KWH	.0660
Over Hydro	.0844
CA Conservation Charge	.0038
Utility Users Tax	2.5%

Electric Rates – Effective March 1, 2018 (Rates were calculated using CPI of 2%)

Summer Rates – March 1 thru September 2018

Basic Service Charge	$28.90
Hydro Allotment **756 KWH**	.0629
Over Hydro	.0844
CA Conservation Charge	.0038
Utility Users Tax	2.5%

Electric Rates – Effective October 1, 2016 (Rates were calculated using CPI of 1.61%)

Winter Rates – October 1 thru December 31

Basic Service Charge	$28.33
Hydro Allotment **411 KWH**	.0693
Over Hydro	.0933
CA Conservation Charge	.0039
Utility Users Tax	2.5%

Electric Rates – Effective January 1, 2017 (Rates were calculated using CPI of 1.61%)

Winter Rates – January 1 thru February 28

Basic Service Charge	$28.33
Hydro Allotment **411 KWH**	.0693
Over Hydro	.0459
CA Conservation Charge	.0039
Utility Users Tax	2.5%

Electric Rates – Effective March 1, 2017 (Rates were calculated using CPI of 1.61%)

Summer Rates – March 1 thru March 30

Basic Service Charge	$28.33
Hydro Allotment **751 KWH**	.0651
Over Hydro	.0459
CA Conservation Charge	.0039
Utility Users Tax	2.5%

Electric Rates – Effective November 1, 2015 (Rates were calculated using CPI of 1.1%)

Winter Rates – November 1 thru February 28

Basic Service Charge	$27.88
Hydro Allotment **389 KWH**	.0713
Over Hydro	.1007
CA Conservation Charge	.0039
Utility Users Tax	2.5%

Summer Rates – March 1 thru October 31

Basic Service Charge	$27.88
Hydro Allotment **712 KWH**	.0680
Over Hydro	.1007
CA Conservation Charge	.0039
Utility Users Tax	2.5%

The electric rates for November 2014

Basic Service Charge		$27.58
El Hydro	370 KWH	.0843
El Usage		.1123
El Conservation		.0039

The electric rates for March 2015

Basic Service Charge		$27.58
El Hydro	697 KWH	.0804
El Usage		.1123
El Conservation		.0039

The electric rates for April 2015 (.0025% PCA attached to Usage to offset the PCA being in the red until September 2015)

Basic Service Charge		$27.58
El Hydro	697 KWH	.0804
El Usage		
El Conservation		.0039

SECTION 2 AMENDED BY NEEDLES CITY COUNCIL AND NEEDLES PUBLIC UTILITIES AUTHORITY DECEMBER 8, 2015 AMENDED MAY 7, 2019

PHOTOVOLTAIC INTERCONNECTION AGREEMENT FOR NET ENERGY METERING FROM RESIDENTIAL AND SMALL COMMERCIAL SOLAR ELECTRIC GENERATING FACILITIES OF 10 KILOWATTS OR LESS

_____("Customer-Generator"), and
Needles Public Utility Authority **("NPUA")** referred to collectively as "Parties" and individually as "Party", agree
as follows:

1. SOLAR-ELECTRIC GENERATING FACILITY:

1.1 PVID Number: _____

1.2 PV Array Rating: _____kW.

1.3 Address: _____

1.4 Facility will be ready for operation on or about_____
(date)

1.5 Location of NPUA Substation and Circuit:

_____

1.6 Operating Option

Customer-Generator has elected to operate its solar-electric generating facility in parallel with NPUA's facilities. The solar-electric generating facility is intended primarily to offset part or all of the Customer-Generator's own electrical requirements.

2. PAYMENT FOR NET ENERGY

2.1 For eligible residential and small commercial customer-generators, the net energy metering calculation shall be made by measuring the difference between the electricity supplied to the eligible customer-generator and the electricity generated by the eligible customer-generator and fed back to the electric grid over a monthly and 12-month period. The following rule shall apply to the annualized net metering calculation:

2.2 Customer will be billed on a monthly basis, regardless of Customer's previous billing cycle. The monthly Net Energy Metering calculation shall be made by measuring the difference between the electricity supplied to the Customer and the electricity generated by the Customer and fed back to the grid over a normal one-month billing period.

2.3 At the end of each one-month billing period following the date of first interconnection, NPUA shall determine if Customer was a net consumer or a net producer of electricity during the one-month time period.

2.4 In the event the electricity supplied by NPUA during the one-month period exceeds the electricity generated and fed back to the grid by Customer during the same period, Customer is a net energy consumer. If Customer is a net energy consumer, NPUA shall bill Customer for the net energy consumption during such billing period based on the Customer's Rate Schedule and Customer shall pay for such net energy consumption monthly in accordance with Customer's monthly billing statement.

2.5 In the event the electricity supplied by NPUA during the one-month period is less than the electricity generated and fed back to the grid by Customer during the same period, Customer is a net energy producer. If Customer is a net energy producer, any excess kilowatt-hours generated during the billing cycle shall be carried over to the following billing period on a monetary basis until the end of the 12-month period.

2.6 Any net monthly consumption of electricity shall be calculated according to the terms of the rate schedule. If Customer is a net generator over a billing period, the net kilowatt-hours generated shall be valued at the same price per kilowatt-hour as NPUA would charge for the baseline quantity of electricity during that billing period, and if the number of kilowatt-hours generated exceeds the baseline quantity, the excess shall be valued at the same price per kilowatt-hour as NPUA would charge electricity over the baseline quantity during the billing period.

2.7 The eligible customer –generator account shall, at the end of the 12-month period following the date of final interconnection of the customer-generator's system with the NPUA distribution system, and at each anniversary month thereafter, be evaluated and reconciled for electricity used or generated during the period.

2.8 NPUA shall retain any Net Surplus Energy generated by Customer, including any associated environmental attributes or renewable energy credits ("RECs"), and Customer's credits shall be reset to zero for the subsequent 12-month period. No payment will be made to Customer for the excess energy delivered to NPUA's grid, unless Customer elects a compensation option in Subsection 2.11.

2.9 NPUA will determine if the customer-generator was a net consumer or a net producer of electricity during that period.

2.10 Customer may be eligible for Net Surplus Energy Compensation. The Customer's Net Surplus Energy Compensation shall be calculated over a 12-month period. If Customer is eligible for Net Surplus Compensation, customer shall be compensated pursuant to the method selected by Customer in Subsection 2.11. Such Net Surplus Compensation Rate shall provide just and reasonable compensation for the value of the Net Surplus Energy, and shall be adopted by the Board of Public Utilities and the Needles Public Utility Authority. Such Net Surplus Compensation Rate shall be reviewed and subject to change on an annual basis.

2.11 At the end of the 12-month period, upon certification by the Customer that they have sole ownership of the environmental attributes and RECs associated with the energy generated from the Generating Facility in accordance with Subsection 2.12 Customer may receive Net Surplus Energy Compensation for Net Surplus Energy by affirmatively electing one of the following methods (Please initial just one): The Customer will be required to complete this form annually prior to the end of a 12-month period. If an annual form is not returned by the requested due date the response below will automatically be the default response.

(a). ___ Receive monetary compensation for Net Surplus Generation exported to NPUA during the prior 12-month period at the Net Surplus Energy Compensation Rate

(b).____ Receive the Net Surplus Energy Compensation as a kilowatt-hour credit calculated using the Net Surplus Energy Compensation rate and applied against future billing periods.

___ (Please initial) By making this election, I also agree that all environmental attributes and RECs associated with the kilowatt-hours generated shall be the property of NPUA.

2.12 Customer hereby certifies that they have sole ownership of the environmental attributes and RECs associated with the energy generated from the Generating Facility. For Customers who elect to receive Net Surplus Energy Compensation based on a per kilowatt-hour rate in accordance with Subsection 2.11, the environmental attributes and RECs associated with the kilowatt-hours in which the Customer received Net Surplus Energy Compensation at the per kilowatt-hour rate shall be the property of the NPUA. Customer hereby transfers to the NPUA all rights, title, and interest Customer has to such environmental attributes and RECs. Customers who elect to receive Net Surplus Energy Compensation based on a per kilowatt-hour credit calculated using the net surplus energy compensation rate and applied in accordance with Subsection 2.11 may elect to transfer to City all rights, title, and interest Customer has to such environmental attributes and RECs.

2.13 All net consumption over 12 months will be charged the Utility Users Tax, not to exceed the rate of two and a half percent (2.5%) as

established by Ordinance No. 545-AC and the Mandated Conservation fee (adopted every October) as established by Resolution No. 7-24-07.

3. INTERRUPTION OR REDUCTION OF DELIVERIES

3.1 NPUA shall not be obligated to accept or pay for, and may require Customer-Generator to interrupt or reduce, deliveries of as-available energy:

(a) When necessary in order to construct, install, maintain, repair, replace, remove,
Investigate, or inspect any of its equipment or any part of its system; or

(b) If NPUA determines that curtailment, interruption, or reduction is necessary because of emergencies, forced outages, force majeure, or compliance with prudent electrical practices.

3.2 Whenever possible, NPUA shall give Customer-Generator reasonable notice of the possibility that interruption or reduction of deliveries may be required.

3.3 Notwithstanding any other provisions of this Agreement, if at any time NPUA determines that either:

(a) the facility may endanger NPUA personnel, or

(b) the continued operation of Customer-Generator's facility may endanger the integrity of NPUA's 's electric system, NPUA shall have the right to disconnect Customer-Generator's facility from NPUA 's electric system. Customer-Generator's facility shall remain disconnected until such time as NPUA is satisfied that the conditions(s) referenced in (a) or (b) of this Section 3.3 have been corrected.

4. INTERCONNECTION

4.1 Customer-Generator shall deliver the as-available energy to NPUA at the utility's meter.

4.2 Customer-Generator shall pay for designing, installing, operating, and maintaining the solar-electric generating facility in accordance with all applicable laws and regulations and shall comply with NPUA's Appendix A, which is attached hereto.

4.3 Customer-Generator shall not commence parallel operation of the generator facility until written approval of the interconnection facilities has been given by NPUA. Such approval shall not be unreasonably withheld. NPUA shall have the right to have representatives present at the initial testing of Customer-Generator's protective apparatus.

5. METER REQUIREMENTS

5.1 NPUA shall own, operate and maintain on Customer's premises a single meter capable of registering the flow of electricity in two directions ("Required Meter"). In addition, the meter shall be capable of recording time-of-use information for all customers. NPUA may waive metering requirements of this Section; provided such waiver shall be applied in a non-discriminatory manner.

5.2 If the existing electrical meter of Customer is not capable of measuring the flow of electricity in two directions or supplying time-of-use information, Customer shall be responsible for all expenses involved in NPUA purchase and installation of a Required Meter. NPUA may waive metering expenses of this Section; provided such a waiver shall be applied in a non-discriminatory manner.

6. OWNERSHIP OF ENVIRONMENTAL ATTRIBUTES

Customer shall assign NPUA any and all environmental attributes, renewable energy credits ("RECs"), green tags, energy or carbon credits/allowances with respect to the PV solar systems, and agree that NPUA shall have sole discretion and full benefits of any and all environmental attributes from distributed solar generation within NPUA service territory.

5. MAINTENANCE AND PERMITS

Customer-Generator shall obtain any governmental authorizations and permits required for the construction and operation of the solar-electric generating facility and interconnection facilities and shall maintain all facilities in a safe and prudent manner and in conformance with all applicable laws and regulations including, but not limited to, NPUA*'s* Appendix A.

Customer-Generator shall reimburse NPUA for any and all losses, damages, claims, penalties, or liability it incurs as a result of Customer-Generator's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of Customer-Generator's generating facility.

6. ACCESS TO PREMISES

NPUA may enter Customer-Generator's premises:

(a) to inspect, at all reasonable hours, Customer-Generator's protective devices and read or test meter; and

(b) to disconnect, without notice the interconnection facilities if, in NPUA's opinion, a hazardous condition exists and such immediate action is necessary to protect persons, or NPUA*'s* facilities, or

property of others from damage or interference caused by Customer-Generator's solar-electric facilities, or lack of properly operating protective devices.

7. INDEMNITY AND LIABILITY

7.1 Each party as indemnitor shall defend, hold harmless, and indemnify the other Party and the directors, officers, employees, and agents of such other Party against and from any and all loss, liability, damage, claim, cost, charge, demand, or expense (including any direct, indirect, or consequential loss, liability, damage, claim, cost, charge, demand, or expense, including attor4ney's fees) for injury or death to persons including employees of either Party and damage to property including property of either Party arising out of or in connection with (a) the engineering, design, construction, maintenance, repair, operation, supervision, inspection, testing, protection or ownership of, or (b) the making of replacements, additions, betterments to, or reconstruction of, the indemnitor's facilities; provided, however, Customer-Generator's duty to indemnify NPUA hereunder shall not extend to loss, liability, damage, claim, cost, charge, demand, or expense resulting from interruptions in electrical service to NPUA*'s* customers other than Customer-Generator. This indemnity shall apply notwithstanding the active or passive negligence of the indemnitee. However, neither Party shall be indemnified hereunder for its loss, liability, damage, claim, cost, charge, demand, or expense resulting from its sole negligence or willful misconduct.

7.2 Not withstanding the indemnity of Section 7.1, and except for a Party's willful misconduct or sole negligence, each Party shall be responsible for damage to its facilities resulting from electrical disturbances or faults.

7.3 The provisions of this Section 7 shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with provisions of any valid insurance policy.

7.4 Except as otherwise provided in Section 7.1, neither Party shall be liable to the other Party for consequential damages incurred by that Party.

7.5 If Customer-Generator fails to comply with the insurance provisions of this Agreement, if any, Customer-Generator shall, at its own cost, defend, hold harmless and indemnify NPUA, its directors, officers, employees, agents, assignees, and successors in interest from and against any and all loss, liability, damage, claim, cost, charge, demand, or expense of any kind or nature (including attorneys' fee and other costs of litigation) resulting from the death or injury to any person or damage to any property, including the personnel and property of NPUA, to the extent that NPUA would have been protected had Customer-Generator complied with all such insurance provisions. The inclusion of this Section 7.5 is not intended to create any express or implied right in Customer-Generator to elect not to provide any such required insurance.

8. INSURANCE *(Optional)*

8.1 Customer-Generator shall maintain, during the term of this Agreement Comprehensive Personal Liability Insurance with a combined single limit of not less than one hundred thousand dollars ($100,000) for each occurrence.

8.2 Such insurance required in Section 8.1 shall, by endorsement to the policy or policies, provide for thirty (30) calendar days written notice to NPUA prior to cancellation, termination, alterations, or material change of such insurance.

8.3 NPUA shall have the right to inspect or obtain a copy of the original policy or policies of insurance.

8.4 Customer-Generator shall furnish the required certificates and endorsements to NPUA prior to commencing operation.

8.5 All insurance certificates, endorsements, cancellations, terminations, alterations, and material changes of such insurance shall be issued and submitted to the following:

NPUA - 817 Third Street
Needles, California 92363

9. GOVERNING LAW

This Agreement shall be interpreted, governed, and construed under the laws of the State of California as if executed and to be performed wholly within the State of California.

10. AMENDMENT MODIFICATION OR WAIVER

Any amendments or modifications to this Agreement shall be in writing and agreed to by both Parties, The failure of any Party at any time or times to require performance of any provision hereof shall in no manner affect the right at a later time to enforce the same.

No waiver by any Party of the breach of any term of covenant contained in this Agreement, whether by conduct or otherwise, shall be deemed to be construed as a further or continuing waiver of any such breach or waiver of the breach of any other term or convent unless such waiver is in writing.

11. APPENDIX

The Agreement includes the following appendix, which is attached and incorporated by reference:

12. NOTICES

All written Notices shall be directed as follows:

NPUA- 817 Third Street
Needles, California 92363

CUSTOMER-GENERATOR:

Name
Address
City

Customer-Generator's notices to NPUA pursuant to this Section 12 shall reference the PVID Number set forth in Section 1.1

12.1 In the event of an emergency, Customer shall immediately notify NPUA at its 24-hour emergencies number,760-326-5700, of any emergency situation related to the Generating Facility.

13. TERM OF AGREEMENT

This Agreement shall be in effect when signed by the Customer-Generator and NPUA and shall remain in effect thereafter month-to-month unless terminated by either Party on thirty (30) days' prior written notice in accordance with Section 12.

14. ASSIGNMENT PROHIBITED

Customer-Generator understands and agrees that this Agreement is personal to Customer and that Customer-Generator shall not assign or transfer in any way all or any portion of this Agreement to any other person or entity of any kind. Any attempt by Customer-Generator to assign or transfer in any way all or any portion of this Agreement shall be void ab initio.

15. SIGNATURES

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Agreement to be executed by their duly authorized representatives.

(CUSTOMER-GENERATOR)	NPUA
By: _____	By: _____
Name:	Name
Title:	Title:
Date: _____	Date:_____

NEEDLES PUBLIC UTILITY AUTHORITY

ANNUAL BASE RATE CALCULATION SPREADSHEET - FY 2017/2018

MUST MANUALLY CALCULATE SHEET (F9)

Basic Service Charge for New Rate Year	$29.82
PY Non-Power Carry Forward	$0
Asset Replacement Fund Target	$590,419
Total - Non Power Related Expenses	$5,221,671

Power Supply with Line Losses	
Total Power Supply - Sales KWHRs	60,486,000
Power Supply - Winter Hydro	6,096,633
Power Supply - Summer Hydro	15,594,714
Power Supply - Total Hydro	21,691,347
Power Supply - Non Hydro	38,794,653

Hydro Allotment/Cust

406
742

Power Supply Expenses		**Cost Per Kwhr**
Total Power Purchased	$2,200,000	$0.0364
Power Supply - Winter Hydro	$123,067	$0.0202
Power Supply - Summer Hydro	$266,553	$0.0171
Power Supply - Non Hydro	$1,810,380	$0.0467

Revenue From Other Than Power Sold	
Basic Service Charge	$1,073,924
Other Revenue	$1,225,940
Total Non-Power Revenue	$2,299,864

Total Expenses		**Cost Per Kwhr**
Non-Power Related Expenses	$5,221,671	
Total Power Cost	$2,200,000	$0.0364
Total Operating Expense	$7,421,671	

Use this rate for PCA Annual Base Rate for power purchased.

Rate Calculations		**Cost Per Kwhr**	**Bill Rate Per Kwhr**
Rate For Non-Power Related Expenses	$2,721,806	0.0450	
Winter Hydro Sales - (Oct - Feb)	$123,067	0.0202	0.0652
Summer Hydro Sales - (Mar - Sept)	$266,553	0.0171	0.0621
Over Hydro Allotment Sales	$1,810,380	0.0467	0.0917
California Energy Efficiency Program	$200,000		0.0033

Average Avoided Cost

$0.0299

CITY OF NEEDLES

817 Third Street • Needles, California 92363
(760) 326-2113 • FAX (760) 326-6765

CERTIFICATION

A noticed public hearing was held at the regular Needles City Council Meeting of August 13, 2019 for Resolution No. 2019-51, A Resolution of the City of Needles, California requesting a cost-effectiveness determination by the California Energy Commission pursuant to Section 10-109(k) of the 2019 Energy Code.
There were no public comments.

I, Dale Jones, CMC, City Clerk of the City of Needles, California, do hereby certify that the foregoing is a true and correct copy of Resolution Number 2019-51.

Dale Jones, CMC
City Clerk

(SEAL)

Date: August 14, 2019

APPENDIX D:
City of Needles Financial Management Plan

City of Needles, California - Electric Utility

FY 2020 Electric Cost of Service Analysis - 3 Month Operating Reserve

Assumptions & Preliminary Results Workbook

Insert client picture

Stantec

Assumptions

Schedule 1

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Rate Increase Adoption Date	7/1/2019	7/1/2020	7/1/2021	7/1/2022	7/1/2023	7/1/2024	7/1/2025	7/1/2026	7/1/2027	7/1/2028	7/1/2029
Annual Growth											
Electric											
Ending # of Accounts	3,004	3,073	3,115	3,153	3,191	3,229	3,268	3,307	3,346	3,386	3,426
Account Growth	3	69	42	38	38	38	39	39	39	40	40
% Change in Accounts	*0.10%*	*2.30%*	*1.37%*	*1.22%*	*1.21%*	*1.19%*	*1.21%*	*1.19%*	*1.18%*	*1.20%*	*1.18%*
Usage per Account	1,709.17	1,773.97	1,851.15	1,962.22	1,993.23	2,024.88	2,057.12	2,090.02	2,123.57	2,157.76	2,192.64
% Change in Usage per Account	*0.00%*	*3.79%*	*4.35%*	*6.00%*	*1.58%*	*1.59%*	*1.59%*	*1.60%*	*1.61%*	*1.61%*	*1.62%*
Usage	61,612,000	65,416,859	69,195,823	74,242,503	76,324,883	78,459,985	80,672,120	82,940,282	85,265,771	87,674,273	90,143,665
% Change in Usage	*0.00%*	*6.18%*	*5.78%*	*7.29%*	*2.80%*	*2.80%*	*2.82%*	*2.81%*	*2.80%*	*2.82%*	*2.82%*
% Paying Capital Charges	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Capital Spending											
Annual Capital Budget (Future Year Dollars)	$ 190,000	$ 190,000	$ 453,200	$ 1,633,786	$ 480,800	$ 956,682	$ 695,564	$ 716,431	$ 737,924	$ 760,062	$ 782,864
Annual Percent Executed	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Impact Fees											
North Needles Impact Fees	$ 781	$781.00	$781.00	$781.00	$781.00	$781.00	$781.00	$781.00	$781.00	$781.00	$781.00
South Infill Areas Impact Fees	$ 480	$480.00	$480.00	$480.00	$480.00	$480.00	$480.00	$480.00	$480.00	$480.00	$480.00
Average Annual Interest Earnings Rate											
On Fund Balances	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Operating Budget Reserve											
Target (Number of Months of Reserve)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Operating Budget Execution Percentage											
Personal Services	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Variable Operations and Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fixed Operations and Maintenance	100%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
Capital Outlay	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

FY 2020 Beginning Balances as of 7/1/2019

Schedule 2

Stantec Grouping of Funds in Model	Revenue Fund	Restricted Reserves	Large User Connection Fees	Asset Replacement Fund
Current Unrestricted Assets				
Cash and Cash Equivalents	$ 3,262,910	$ -	$ 168,297	$ 2,842,415
Rate Stabilization Fund	-	504,202	-	-
PCA Balancing Fund	-	200,000	-	-
City LAIF (106-01-00)	154,810	-	-	-
Total Assets	**$ 3,417,720**	**$ 704,202**	**$ 168,297**	**$ 2,842,415**
Current Liabilities				
Accounts and Contracts Payable	$ -	$ -	$ -	$ -
Calculated Fund Balance (Assets - Liabilities)	**$ 3,417,720**	**$ 704,202**	**$ 168,297**	**$ 2,842,415**
Funds Encumbered or Reserved for Projects not in the CIP	-	-	-	-
Available Fund Balance	**$ 3,417,720**	**$ 704,202**	**$ 168,297**	**$ 2,842,415**

Fund Summary		
Revenue Fund	$	3,417,720
Rate Stabilization Fund		704,202
Large User Connection Fees		168,297
Asset Replacement Fund		2,842,415
Total Available Funds	**$**	**7,132,634**

Projection of Cash Inflows

Schedule 3

		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
1	**Rate Revenue Growth Assumptions**											
	Electric											
2	% Change in Accounts	0.10%	2.30%	1.37%	1.22%	1.21%	1.19%	1.21%	1.19%	1.18%	1.20%	1.18%
3	% Change in Consumption	0.00%	6.18%	5.78%	7.29%	2.80%	2.80%	2.82%	2.81%	2.80%	2.82%	2.82%
	Assumed Rate Revenue Increases											
4	Assumed Electric Rate Increase	0.00%	0.00%	0.00%	0.00%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
5	Base Rate COLA Increse	0.00%	0.00%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%
	Electric Rate Revenue											
6	Base Rate Revenue	$ 1,102,900	$ 1,153,054	$ 1,194,527	$ 1,235,700	$ 1,278,105	$ 1,321,779	$ 1,367,174	$ 1,413,926	$ 1,462,074	$ 1,512,103	$ 1,563,625
7	Usage Rate Revenue	4,979,666	5,287,187	5,592,614	6,000,502	6,215,072	6,436,848	6,667,969	6,906,860	7,153,769	7,411,011	7,676,894
8	**Total Electric Rate Revenue**	**$ 6,082,567**	**$ 6,440,241**	**$ 6,787,141**	**$ 7,236,201**	**$ 7,493,177**	**$ 7,758,627**	**$ 8,035,143**	**$ 8,320,786**	**$ 8,615,843**	**$ 8,923,113**	**$ 9,240,519**
	Other Operating Revenue											
10	Establishment Fee	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000
11	Damage Claims	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
12	Jnt Use Attach Fee-Poles	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
13	**Total Other Operating Revenue**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**	**$ 37,000**
	Non-Operating Revenue											
14	Miscellaneous	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000
15	Refunds/Reimbursements	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
16	**Total Non-Operating Revenue**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**	**$ 50,000**
17	**Total Cash Inflows**	**$ 6,169,567**	**$ 6,527,241**	**$ 6,874,141**	**$ 7,323,201**	**$ 7,580,177**	**$ 7,845,627**	**$ 8,122,143**	**$ 8,407,786**	**$ 8,702,843**	**$ 9,010,113**	**$ 9,327,519**

Projection of Cash Outflows

Schedule 4

	Account Code	Account Code	Expense Line Item	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
1			**O&M**											
			Personal Services											
2	OMF	O&M	*Salaries	$ 627,805	$ 811,182	$ 831,462	$ 852,248	$ 873,554	$ 895,393	$ 917,778	$ 940,722	$ 964,240	$ 988,346	$ 1,013,055
4	OMF	O&M	*Overtime	58,129	75,000	76,875	78,797	80,767	82,786	84,856	86,977	89,151	91,380	93,665
5	OMF	O&M	*Fica Soc Sec/M-Care Ins	47,221	67,793	74,572	82,030	90,232	99,256	109,181	120,099	132,109	145,320	159,852
6	OMF	O&M	*Group Insurance	124,594	190,926	210,019	231,020	254,123	279,535	307,488	338,237	372,061	409,267	450,194
7	OMF	O&M	*Workers' Compensation	24,469	19,100	19,387	19,677	19,972	20,272	20,576	20,885	21,198	21,516	21,839
8	OMF	O&M	*Pers/Retirement Contrib.	45,166	65,019	65,994	66,984	67,989	69,009	70,044	71,095	72,161	73,243	74,342
9	OMF	O&M	Employee Meals	342	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
			Operations & Maintenance											
10	OMF	O&M	*Pers-Unfunded Liability	$ 50,108	$ 68,570	$ 69,599	$ 70,643	$ 71,702	$ 72,778	$ 73,869	$ 74,977	$ 76,102	$ 77,244	$ 78,402
11	OMF	O&M	Consulting Services	462	11,000	11,275	11,557	11,846	12,142	12,445	12,757	13,076	13,402	13,737
12	OMF	O&M	Lwr Col Multi-Sp Cons Pro	5,227	7,500	7,688	7,880	8,077	8,279	8,486	8,698	8,915	9,138	9,366
13	OMF	O&M	Engineering Services	-	4,000	4,100	4,203	4,308	4,415	4,526	4,639	4,755	4,874	4,995
14	OMF	O&M	Medical Exams	1,207	1,300	1,333	1,366	1,400	1,435	1,471	1,508	1,545	1,584	1,624
15	OMF	O&M	Educational Training	6,945	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
16	OMF	O&M	*Audit Fees	15,364	11,700	11,993	12,292	12,600	12,915	13,237	13,568	13,908	14,255	14,612
17	OMF	O&M	*Legal Fees-Electric	32,592	35,000	35,875	36,772	37,691	38,633	39,599	40,589	41,604	42,644	43,710
18	OMF	O&M	Other Professional Svs.	530	20,000	20,500	21,013	21,538	22,076	22,628	23,194	23,774	24,368	24,977
19	OMF	O&M	Street Lights/Area Lights	34,691	38,000	38,950	39,924	40,922	41,945	42,994	44,068	45,170	46,299	47,457
20	OMF	O&M	Water Utilities	610	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
21	OMF	O&M	Sanitation Utilities	255	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
22	OMF	O&M	Vehicle Maint/Repair	271	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
23	OMF	O&M	Equipment Maint Repair	707	6,500	6,663	6,829	7,000	7,175	7,354	7,538	7,726	7,920	8,118
24	OMF	O&M	Structures Maint/Repair	1,742	1,500	1,538	1,576	1,615	1,656	1,697	1,740	1,783	1,828	1,873
25	OMF	O&M	Right Of Way/Easements	29,923	40,566	41,580	42,620	43,685	44,777	45,897	47,044	48,220	49,426	50,661
26	OMF	O&M	Street Lights Maint/Repai	6,468	13,456	13,792	14,137	14,491	14,853	15,224	15,605	15,995	16,395	16,805
27	OMF	O&M	Damage Claims Repairs	10,385	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
28	OMF	O&M	Tools Maint/Repair	14,867	18,500	18,963	19,437	19,922	20,421	20,931	21,454	21,991	22,540	23,104
29	OMF	O&M	Storm Damage Repairs	10,986	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
30	OMF	O&M	Usa Alert	262	500	513	525	538	552	566	580	594	609	624
31	OMF	O&M	*Liability Insurance	28,550	31,810	32,605	33,420	34,256	35,112	35,990	36,890	37,812	38,757	39,726
32	OMF	O&M	*Blanket Bond Insurance	144	230	236	242	248	254	260	267	273	280	287
33	OMF	O&M	*Property Insurance	25,027	38,755	39,724	40,717	41,735	42,778	43,848	44,944	46,068	47,219	48,400
34	OMF	O&M	Telephone/Cell Phones	8,870	7,242	7,423	7,609	7,799	7,994	8,194	8,398	8,608	8,824	9,044
35	OMF	O&M	Postage	616	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
36	OMF	O&M	Advertising	519	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
37	OMF	O&M	*Economic Dev. Consulting	11,208	29,190	29,920	30,668	31,434	32,220	33,026	33,851	34,698	35,565	36,454
38	OMF	O&M	Conservation	1,536	-	-	-	-	-	-	-	-	-	-
39	OMF	O&M	Conservat/Solar Rebates	10,636	18,248	18,704	19,172	19,651	20,142	20,646	21,162	21,691	22,233	22,789
40	OMF	O&M	Travel Per Diem	1,173	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
41	OMF	O&M	Dues And Membership	7,161	8,000	8,200	8,405	8,615	8,831	9,051	9,278	9,509	9,747	9,991
42	OMF	O&M	Licensing	-	100	103	105	108	110	113	116	119	122	125
43	OMF	O&M	*Utility Business Office	125,654	115,513	118,401	121,361	124,395	127,505	130,692	133,960	137,309	140,741	144,260
44	OMF	O&M	*Central Purchasing Adm	58,720	102,779	105,348	107,982	110,682	113,449	116,285	119,192	122,172	125,226	128,357
45	OMF	O&M	*Mgmt Info Sys/0 & M	44,785	45,050	46,176	47,331	48,514	49,727	50,970	52,244	53,550	54,889	56,261
46	OMF	O&M	*Fleet Maintenance	124,300	122,070	125,122	128,250	131,456	134,742	138,111	141,564	145,103	148,730	152,449
47	OMF	O&M	*Vehicle Replacement Fund	110,000	110,000	112,750	115,569	118,458	121,419	124,455	127,566	130,755	134,024	137,375
48	OMF	O&M	*Finance Dept. Services	3,500	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
49	OMF	O&M	Hazardous Waste Removal	137	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
50	OMF	O&M	Boots	695	2,500	2,563	2,627	2,692	2,760	2,829	2,899	2,972	3,046	3,122
51	OMF	O&M	Office Supplies	372	1,000	1,025	1,051	1,077	1,104	1,131	1,160	1,189	1,218	1,249
52	OMF	O&M	Computer/Printer Supplies	1,898	3,500	3,588	3,677	3,769	3,863	3,960	4,059	4,160	4,264	4,371
53	OMF	O&M	Uniforms	8,151	9,000	9,225	9,456	9,692	9,934	10,183	10,437	10,698	10,966	11,240
54	OMF	O&M	Safety Equip./Training	11,399	25,000	25,625	26,266	26,922	27,595	28,285	28,992	29,717	30,460	31,222
55	OMF	O&M	Vehicle Fuel	11,736	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
56	OMF	O&M	Ab32 Surcharge Rps/C&T	22,528	100,000	105,341	111,903	115,910	120,064	124,395	128,892	133,563	138,443	143,519
57	OMF	O&M	Power Scheduling Consult	467	10,000	10,534	11,190	11,591	12,006	12,439	12,889	13,356	13,844	14,352
58	OMF	O&M	Hank Service Charge	9	100	103	105	108	110	113	116	119	122	125
59	OMF	O&M	Substation/Generation Imp	-	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
60	OMF	O&M	Plant	41,320	-	-	-	-	-	-	-	-	-	-
61	OMF	O&M	Substation Maint/Repair	1,450	13,100	13,428	13,763	14,107	14,460	14,821	15,192	15,572	15,961	16,360
62			**Total O&M**	**$ 1,837,376**	**$ 2,376,799**	**$ 2,457,221**	**$ 2,542,768**	**$ 2,629,572**	**$ 2,720,924**	**$ 2,817,198**	**$ 2,918,759**	**$ 3,026,028**	**$ 3,139,491**	**$ 3,259,629**

Projection of Cash Outflows

Schedule 4

	Account Code	Account Code	Expense Line Item	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
63			**Other Operating Expenses**											
64			**Operations & Maintenance**											
65	OMV	Conservation Program	*PUBLIC EDUCATION	$ 16,667	$ 16,667	$ 17,084	$ 17,511	$ 17,949	$ 18,397	$ 18,857	$ 19,329	$ 19,812	$ 20,307	$ 20,815
66	OMV	California Energy Efficiency	CONS-ENERGY EFFICIENCY	200,000	200,000	205,000	210,125	215,378	220,763	226,282	231,939	237,737	243,681	249,773
67	OMF	O&M	PURCHASED INVEN-ONSITE	530,000	300,000	307,500	315,188	323,067	331,144	339,422	347,908	356,606	365,521	374,659
68	OMV	Power Supply Total	ELECTRICAL POWER PURCHASE	2,200,000	2,326,652	2,507,669	2,744,793	2,852,644	2,963,417	3,078,201	3,196,098	3,317,190	3,442,628	3,571,469
69	OMV	Power Supply Total	PURCHASED POWER - AMPS	1,573	1,663	1,793	1,962	2,039	2,118	2,200	2,285	2,371	2,461	2,553
70	OMV	Taxes	SALES TAX	17,307	15,000	15,375	15,759	16,153	16,557	16,971	17,395	17,830	18,276	18,733
71			**Total Other Operating Expenses**	**$ 2,965,546**	**$ 2,859,982**	**$ 3,054,420**	**$ 3,305,338**	**$ 3,427,230**	**$ 3,552,397**	**$ 3,681,934**	**$ 3,814,953**	**$ 3,951,546**	**$ 4,092,873**	**$ 4,238,001**
72			**Total Expenses by Category**											
73	OMV		Variable Operations & Maintenance	2,435,546	2,559,982	2,746,920	2,990,150	3,104,163	3,221,253	3,342,511	3,467,045	3,594,941	3,727,353	3,863,342
74	OMF		Operations & Maintenance	2,367,376	2,676,799	2,764,721	2,857,955	2,952,639	3,052,068	3,156,620	3,266,667	3,382,634	3,505,012	3,634,288
75			**Total Expenses**	**$ 4,802,922**	**$ 5,236,781**	**$ 5,511,641**	**$ 5,848,106**	**$ 6,056,803**	**$ 6,273,320**	**$ 6,499,132**	**$ 6,733,712**	**$ 6,977,574**	**$ 7,232,364**	**$ 7,497,630**
76			**Expense Execution Factors**											
77			Variable Operations & Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
78			Operations & Maintenance	100%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
79			Capital Outlay	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
80			**Total Expenses at Execution**											
81			Variable Operations & Maintenance	2,435,546	2,559,982	2,746,920	2,990,150	3,104,163	3,221,253	3,342,511	3,467,045	3,594,941	3,727,353	3,863,342
82			Operations & Maintenance	2,367,376	2,442,579	2,522,808	2,607,884	2,694,283	2,785,012	2,880,416	2,980,833	3,086,653	3,198,323	3,316,288
83			**Total Expenses at Execution**	**$ 4,802,922**	**$ 5,002,561**	**$ 5,269,728**	**$ 5,598,034**	**$ 5,798,447**	**$ 6,006,264**	**$ 6,222,927**	**$ 6,447,879**	**$ 6,681,594**	**$ 6,925,676**	**$ 7,179,630**
84			**Transfers Out**											
85		ARF	ARF Transfer	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 420,000	$ 430,000	$ 440,000	$ 440,000	$ 450,000	$ 460,000
86		Fair Share Fee	Fairshare Allocation	429,702	442,593	455,871	469,547	483,633	498,142	513,087	528,479	544,334	560,664	577,484
87		Trustee Fee	Fund 501 Trustee Fees	13,630	13,630	13,630	13,630	13,630	13,630	13,630	13,630	13,630	13,630	13,630
88		Purchase Payment	Fund 501 Purchase Payments	313,223	313,223	313,223	313,223	313,223	313,223	313,223	313,223	313,223	313,223	313,223
89			**Total Transfers Out**	**$ 1,156,555**	**$ 1,169,446**	**$ 1,182,724**	**$ 1,196,400**	**$ 1,210,486**	**$ 1,244,995**	**$ 1,269,940**	**$ 1,295,332**	**$ 1,311,187**	**$ 1,337,517**	**$ 1,364,337**
90			**Debt Service**											
91		Debt Service	Needles PUA 2016 Electirc Rev BDS	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640	$ 682,640
92			**Total Debt Service**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**
93			**Total Cash Outflows**	**$ 6,642,117**	**$ 6,854,647**	**$ 7,135,092**	**$ 7,477,074**	**$ 7,691,573**	**$ 7,933,900**	**$ 8,175,507**	**$ 8,425,851**	**$ 8,675,420**	**$ 8,945,832**	**$ 9,226,606**

Cost Escalation Factors

Schedule 5

Expense Line Item Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Health Insurance	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Retirement	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Electric Accounts Growth	2.30%	1.37%	1.22%	1.21%	1.19%	1.21%	1.19%	1.18%	1.20%	1.18%
Electric Usage Growth	6.18%	5.78%	7.29%	2.80%	2.80%	2.82%	2.81%	2.80%	2.82%	2.82%
Electric Power Purchase	5.76%	7.78%	9.46%	3.93%	3.88%	3.87%	3.83%	3.79%	3.78%	3.74%
Winter Hydro	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%	3.59%
Summer Hydro	3.66%	3.66%	3.66%	3.66%	3.66%	3.66%	3.66%	3.66%	3.66%	3.66%
Composite O&M	4.16%	5.34%	6.23%	3.58%	3.58%	3.61%	3.61%	3.62%	3.65%	3.67%
No Escalation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Default Inflation Factor [1]	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%
Weighted Average Increase in O&M Expenses [2]	4.16%	5.34%	6.23%	3.58%	3.58%	3.61%	3.61%	3.62%	3.65%	3.67%

[1] Federal Reserve Forecast, Long-Term Annual Average CPI
[2] The Weighted Average Increase in O&M Expenses is reflective of the cost escalation factors presented on this schedule and the cost execution factors on Schedule 1.

Capital Improvement Program

Schedule 6

		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
1	Meter replacement	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ -	$ -	$ -	$ -	$ -	$ -
2	Cure Farms substation	-	-	-	1,100,000	-	-	-	-	-	-	-
3	Electric circuit reliability program	160,000	160,000	160,000	160,000	160,000	-	-	-	-	-	-
4	1 MW Solar Project	-	-	250,000	250,000	250,000	250,000	-	-	-	-	-
5	AMI Project	-	-	-	-	-	-	-	-	-	-	-
6	Long-Term Average CIP	-	-	-	-	-	600,000	600,000	600,000	600,000	600,000	600,000
7	**Total CIP Budget (in current dollars)**	**$ 190,000**	**$ 190,000**	**$ 440,000**	**$ 1,540,000**	**$ 440,000**	**$ 850,000**	**$ 600,000**	**$ 600,000**	**$ 600,000**	**$ 600,000**	**$ 600,000**
8	Cumulative Projected Cost Escalation[1]	0.0%	0.0%	3.0%	6.1%	9.3%	12.6%	15.9%	19.4%	23.0%	26.7%	30.5%
9	**Resulting CIP Funding Level**	**$ 190,000**	**$ 190,000**	**$ 453,200**	**$ 1,633,786**	**$ 480,800**	**$ 956,682**	**$ 695,564**	**$ 716,431**	**$ 737,924**	**$ 760,062**	**$ 782,864**
10	Annual CIP Execution Percentage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11	**Final CIP Funding Level**	**$ 190,000**	**$ 190,000**	**$ 453,200**	**$ 1,633,786**	**$ 480,800**	**$ 956,682**	**$ 695,564**	**$ 716,431**	**$ 737,924**	**$ 760,062**	**$ 782,864**

[1] CIP Escalation factors are consistent with the Engineering News Record Construction Cost Index.

FAMS - Control Panel **Schedule 7**

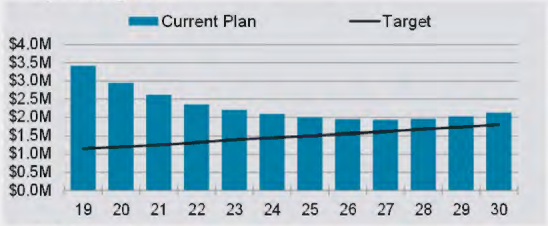
FAMS | CITY OF NEEDLES, CA - ELECTRIC UTILITY

Stantec

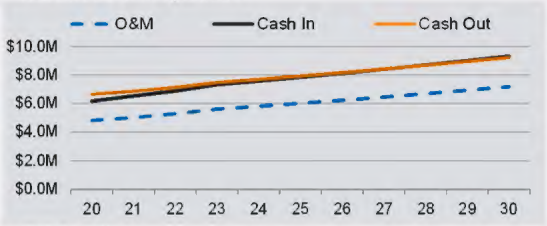
CALC | SAVE | CTRL | LAST | OVR

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2025	FY 2030
Electric Rate Plan	0.00%	0.00%	0.00%	0.00%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	1.96%	7.09%
Oper Reserve Mos	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	Start Year	2022
Additional ARF ($M)	$0.40	$0.40	$0.40	$0.40	$0.40	$0.42	$0.43	$0.44	$0.44	$0.45	$0.46	Exp Duration	1
Days Cash on Hand	509	459	415	378	353	304	276	250	227	207	189	**Cure Farms**	Include
Proposed Rates													
Basic Service Charge	$ 30.60	31.27	31.96	32.66	33.38	34.11	34.86	35.63	36.41	37.21	38.03		
Winter Hydro Rate	$ 0.0635	0.0645	0.0646	0.0647	0.0657	0.0667	0.0677	0.0687	0.0698	0.0710	0.0721	**UUT**	Exclude
Summer Hydro Rate	$ 0.0593	0.0603	0.0605	0.0606	0.0616	0.0626	0.0636	0.0648	0.0659	0.0671	0.0684		
Over Hydro	$ 0.0871	0.0860	0.0854	0.0848	0.0850	0.0853	0.0855	0.0858	0.0860	0.0863	0.0866		
CA Conservation Charge	$ 0.0032	0.0031	0.0030	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028		
Sample Winter Bill	$147.96	$147.91	$148.04	$148.09	$149.46	$150.87	$152.32	$153.80	$155.31	$156.87	$158.46		
Sample Summer Bill	$213.52	$213.38	$213.32	$213.12	$215.05	$217.02	$219.05	$221.14	$223.27	$225.46	$227.70		

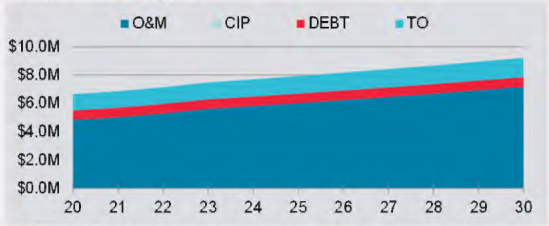
Operating Fund



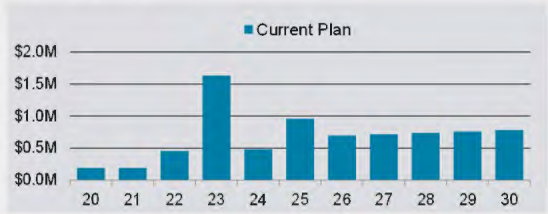
Revenues vs. Expenses



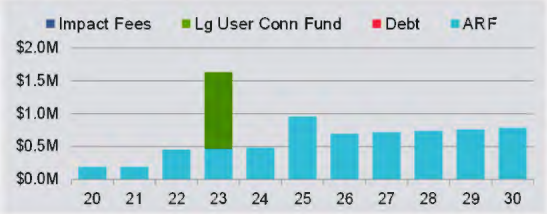
Expenses by Type



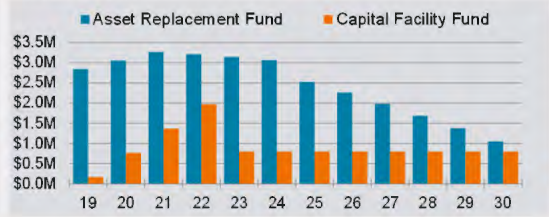
CIP Spending



CIP Funding



Other Funds



Pro Forma **Schedule 8**

			FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
1	**Operating Revenue**												
2	Electric Rate Revenue		$ 4,979,666	$ 4,979,666	$ 5,287,187	$ 5,592,614	$ 6,000,502	$ 6,215,072	$ 6,436,848	$ 6,667,969	$ 6,906,860	$ 7,153,769	$ 7,411,011
3	Change in Revenue From Growth		-	307,520	305,427	407,888	168,304	173,860	181,483	187,475	193,655	202,073	208,735
4	Subtotal		$ 4,979,666	$ 5,287,187	$ 5,592,614	$ 6,000,502	$ 6,168,806	$ 6,388,931	$ 6,618,332	$ 6,855,444	$ 7,100,516	$ 7,355,842	$ 7,619,746
5	*Weighted Average Rate Increase*		*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.75%*	*0.75%*	*0.75%*	*0.75%*	*0.75%*	*0.75%*	*0.75%*
6	Additional Rate Revenue From Rate Increase		-	-	-	-	46,266	47,917	49,637	51,416	53,254	55,169	57,148
7	Total Rate Revenue		$ 4,979,666	$ 5,287,187	$ 5,592,614	$ 6,000,502	$ 6,215,072	$ 6,436,848	$ 6,667,969	$ 6,906,860	$ 7,153,769	$ 7,411,011	$ 7,676,894
8	Plus: Other Operating Revenue		1,139,900	1,190,054	1,231,527	1,272,700	1,315,105	1,358,779	1,404,174	1,450,926	1,499,074	1,549,103	1,600,625
9	**Equals: Total Operating Revenue**		**$ 6,119,567**	**$ 6,477,241**	**$ 6,824,141**	**$ 7,273,201**	**$ 7,530,177**	**$ 7,795,627**	**$ 8,072,143**	**$ 8,357,786**	**$ 8,652,843**	**$ 8,960,113**	**$ 9,277,519**
10	**Less: Operating Expenses**												
11	Operations & Maintenance Costs		(2,367,376)	(2,442,579)	(2,522,808)	(2,607,884)	(2,694,283)	(2,785,012)	(2,880,416)	(2,980,833)	(3,086,653)	(3,198,323)	(3,316,288)
12	**Equals: Net Operating Income**		**$ 1,316,645**	**$ 1,474,679**	**$ 1,554,413**	**$ 1,675,167**	**$ 1,731,730**	**$ 1,789,363**	**$ 1,849,215**	**$ 1,909,908**	**$ 1,971,250**	**$ 2,034,438**	**$ 2,097,889**
13	**Plus: Non-Operating Income/(Expense)**												
14	Non-Operating Revenue		$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
15	**Equals: Net Income**		**$ 1,366,645**	**$ 1,524,679**	**$ 1,604,413**	**$ 1,725,167**	**$ 1,781,730**	**$ 1,839,363**	**$ 1,899,215**	**$ 1,959,908**	**$ 2,021,250**	**$ 2,084,438**	**$ 2,147,889**
16	**Less: Revenues Excluded From Coverage Test**												
17	Impact Fees		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Transfers In		-	-	-	-	-	-	-	-	-	-	-
19	**Equals: Net Income Available For Debt Service**		**$ 1,366,645**	**$ 1,524,679**	**$ 1,604,413**	**$ 1,725,167**	**$ 1,781,730**	**$ 1,839,363**	**$ 1,899,215**	**$ 1,959,908**	**$ 2,021,250**	**$ 2,084,438**	**$ 2,147,889**
20	**Senior Lien Debt Service Coverage Test**												
21	Net Income Available for Senior-Lien Debt Service		**$ 1,366,645**	**$ 1,524,679**	**$ 1,604,413**	**$ 1,725,167**	**$ 1,781,730**	**$ 1,839,363**	**$ 1,899,215**	**$ 1,959,908**	**$ 2,021,250**	**$ 2,084,438**	**$ 2,147,889**
22	Existing Senior-Lien Debt		682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640
23	**Total Annual Senior-Lien Debt Service**	**Req.**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**
24	*Calculated Senior-Lien Debt Service Coverage*	**1.25**	**2.00**	**2.23**	**2.35**	**2.53**	**2.61**	**2.69**	**2.78**	**2.87**	**2.96**	**3.05**	**3.15**
25	**Subordinate Debt Service Coverage Test**												
26	Net Income Available for Subordinate Debt Service		**$ 684,005**	**$ 842,039**	**$ 921,773**	**$ 1,042,527**	**$ 1,099,090**	**$ 1,156,723**	**$ 1,216,575**	**$ 1,277,268**	**$ 1,338,610**	**$ 1,401,798**	**$ 1,465,249**
27	**Total Annual Subordinate Debt Service**	**Req.**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
28	*Calculated Subordinate Debt Service Coverage*	**1.20**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
29	**Total All-In Debt Service Coverage Test**												
30	Net Income Available for Subordinate Debt Service		**$ 1,366,645**	**$ 1,524,679**	**$ 1,604,413**	**$ 1,725,167**	**$ 1,781,730**	**$ 1,839,363**	**$ 1,899,215**	**$ 1,959,908**	**$ 2,021,250**	**$ 2,084,438**	**$ 2,147,889**
31	Total Senior-Lien Debt Service		682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640	682,640
32	**Total Annual Debt Service**		**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**	**$ 682,640**
33	*Calculated All-In Debt Service Coverage*		**2.00**	**2.23**	**2.35**	**2.53**	**2.61**	**2.69**	**2.78**	**2.87**	**2.96**	**3.05**	**3.15**
34	**Cash Flow Test**												
35	Net Income Available For Debt Service		$ 1,366,645	$ 1,524,679	$ 1,604,413	$ 1,725,167	$ 1,781,730	$ 1,839,363	$ 1,899,215	$ 1,959,908	$ 2,021,250	$ 2,084,438	$ 2,147,889
36	Less: Non-Operating Expenditures												
37	Net Interfund Transfers (In - Out)		(1,156,555)	(1,169,446)	(1,182,724)	(1,196,400)	(1,210,486)	(1,244,995)	(1,269,940)	(1,295,332)	(1,311,187)	(1,337,517)	(1,364,337)
38	Net Debt Service Payment		(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)	(682,640)
39	**Net Cash Flow**		**$ (472,550)**	**$ (327,407)**	**$ (260,951)**	**$ (153,873)**	**$ (111,396)**	**$ (88,273)**	**$ (53,364)**	**$ (18,065)**	**$ 27,423**	**$ 64,281**	**$ 100,913**
40	**Unrestricted Reserve Fund Test**												
41	Balance At Beginning Of Fiscal Year		$ 3,417,720	$ 2,945,169	$ 2,617,762	$ 2,356,812	$ 2,202,939	$ 2,091,542	$ 2,003,270	$ 1,949,905	$ 1,931,841	$ 1,959,264	$ 2,023,545
42	Cash Flow Surplus/(Deficit)		-	-	-	-	-	-	-	-	27,423	64,281	100,913
43	Reserve Fund Balance Used For Cash Flow Deficit		(472,550)	(327,407)	(260,951)	(153,873)	(111,396)	(88,273)	(53,364)	(18,065)	-	-	-
44	Projects Designated To Be Paid With Cash		-	-	-	-	-	-	-	-	-	-	-
45	**Balance At End Of Fiscal Year**		**$ 2,945,169**	**$ 2,617,762**	**$ 2,356,812**	**$ 2,202,939**	**$ 2,091,542**	**$ 2,003,270**	**$ 1,949,905**	**$ 1,931,841**	**$ 1,959,264**	**$ 2,023,545**	**$ 2,124,457**
46	Minimum Working Capital Reserve Target		1,200,731	1,250,640	1,317,432	1,399,509	1,449,612	1,501,566	1,555,732	1,611,970	1,670,398	1,731,419	1,794,907
47	**Excess/(Deficiency) Of Working Capital To Target**		**$ 1,744,439**	**$ 1,367,122**	**$ 1,039,380**	**$ 803,430**	**$ 641,931**	**$ 501,704**	**$ 394,174**	**$ 319,871**	**$ 288,865**	**$ 292,126**	**$ 329,550**

Capital Project Funding Summary

Schedule 9

Final Capital Projects Funding Sources	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Asset Replacement Fund	$ 190,000	$ 190,000	$ 453,200	$ 466,796	$ 480,800	$ 956,682	$ 695,564	$ 716,431	$ 737,924	$ 760,062	$ 782,864
Revenue Fund	-	-	-	-	-	-	-	-	-	-	-
Total Projects Paid	**$ 190,000**	**$ 190,000**	**$ 453,200**	**$ 1,633,786**	**$ 480,800**	**$ 956,682**	**$ 695,564**	**$ 716,431**	**$ 737,924**	**$ 760,062**	**$ 782,864**

Funding Summary by Fund

Schedule 10

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Asset Replacement Fund											
Balance At Beginning Of Fiscal Year	$ 2,842,415	$ 3,052,415	$ 3,262,415	$ 3,209,215	$ 3,142,419	$ 3,061,619	$ 2,524,937	$ 2,259,372	$ 1,982,941	$ 1,685,016	$ 1,374,954
Annual Revenues	400,000	400,000	400,000	400,000	400,000	420,000	430,000	440,000	440,000	450,000	460,000
Less: Annual Expenses	-	-	-	-	-	-	-	-	-	-	-
Less: Payment Of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	$ 3,242,415	$ 3,452,415	$ 3,662,415	$ 3,609,215	$ 3,542,419	$ 3,481,619	$ 2,954,937	$ 2,699,372	$ 2,422,941	$ 2,135,016	$ 1,834,954
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Total Amount Available For Projects	3,242,415	3,452,415	3,662,415	3,609,215	3,542,419	3,481,619	2,954,937	2,699,372	2,422,941	2,135,016	1,834,954
Amount Paid For Projects	(190,000)	(190,000)	(453,200)	(466,796)	(480,800)	(956,682)	(695,564)	(716,431)	(737,924)	(760,062)	(782,864)
Subtotal	$ 3,052,415	$ 3,262,415	$ 3,209,215	$ 3,142,419	$ 3,061,619	$ 2,524,937	$ 2,259,372	$ 1,982,941	$ 1,685,016	$ 1,374,954	$ 1,052,091
Add Back: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Plus: Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Allocated To Cash Flow	-	-	-	-	-	-	-	-	-	-	-
Balance At End Of Fiscal Year	**$ 3,052,415**	**$ 3,262,415**	**$ 3,209,215**	**$ 3,142,419**	**$ 3,061,619**	**$ 2,524,937**	**$ 2,259,372**	**$ 1,982,941**	**$ 1,685,016**	**$ 1,374,954**	**$ 1,052,091**
Revenue Fund											
Balance At Beginning Of Fiscal Year	$ 3,417,720	$ 2,945,169	$ 2,617,762	$ 2,356,812	$ 2,202,939	$ 2,091,542	$ 2,003,270	$ 1,949,905	$ 1,931,841	$ 1,959,264	$ 2,023,545
Net Cash Flow	(472,550)	(327,407)	(260,951)	(153,873)	(111,396)	(88,273)	(53,364)	(18,065)	27,423	64,281	100,913
Less: Cash-Funded Capital Projects	-	-	-	-	-	-	-	-	-	-	-
Less: Payment Of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	$ 2,945,169	$ 2,617,762	$ 2,356,812	$ 2,202,939	$ 2,091,542	$ 2,003,270	$ 1,949,905	$ 1,931,841	$ 1,959,264	$ 2,023,545	$ 2,124,457
Less: Restricted Funds	(1,200,731)	(1,250,640)	(1,317,432)	(1,399,509)	(1,449,612)	(1,501,566)	(1,555,732)	(1,611,970)	(1,670,398)	(1,731,419)	(1,794,907)
Total Amount Available For Projects	1,744,439	1,367,122	1,039,380	803,430	641,931	501,704	394,174	319,871	288,865	292,126	329,550
Amount Paid For Projects	-	-	-	-	-	-	-	-	-	-	-
Subtotal	$ 1,744,439	$ 1,367,122	$ 1,039,380	$ 803,430	$ 641,931	$ 501,704	$ 394,174	$ 319,871	$ 288,865	$ 292,126	$ 329,550
Add Back: Restricted Funds	1,200,731	1,250,640	1,317,432	1,399,509	1,449,612	1,501,566	1,555,732	1,611,970	1,670,398	1,731,419	1,794,907
Plus: Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Allocated To Cash Flow	-	-	-	-	-	-	-	-	-	-	-
Balance At End Of Fiscal Year	**$ 2,945,169**	**$ 2,617,762**	**$ 2,356,812**	**$ 2,202,939**	**$ 2,091,542**	**$ 2,003,270**	**$ 1,949,905**	**$ 1,931,841**	**$ 1,959,264**	**$ 2,023,545**	**$ 2,124,457**

Projected Rate Schedule

Schedule 11

		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
1	**Rate Escalation**											
2	Consumption Rate Revenue Inc.		0.0%	0.0%	0.0%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
3	CPI Forecast		2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
4	**Winter Rates (effective October 1)**											
5	Basic Service Charge	*$30.60*	*$31.27*	*$31.96*	*$32.66*	*$33.38*	*$34.11*	*$34.86*	*$35.63*	*$36.41*	*$37.21*	*$38.03*
6	Hydro Allotment	*$0.0635*	*$0.0645*	*$0.0646*	*$0.0647*	*$0.0657*	*$0.0667*	*$0.0677*	*$0.0687*	*$0.0698*	*$0.0710*	*$0.0721*
7	Over Hydro	*$0.0871*	*$0.0860*	*$0.0854*	*$0.0848*	*$0.0850*	*$0.0853*	*$0.0855*	*$0.0858*	*$0.0860*	*$0.0863*	*$0.0866*
8	CA Conservation Charge	*$0.0032*	*$0.0031*	*$0.0030*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*
9	**Summer Rates (effective March 1)**											
10	Basic Service Charge	*$30.60*	*$31.27*	*$31.96*	*$32.66*	*$33.38*	*$34.11*	*$34.86*	*$35.63*	*$36.41*	*$37.21*	*$38.03*
11	Hydro Allotment	*$0.0593*	*$0.0603*	*$0.0605*	*$0.0606*	*$0.0616*	*$0.0626*	*$0.0636*	*$0.0648*	*$0.0659*	*$0.0671*	*$0.0684*
12	Over Hydro	*$0.0871*	*$0.0860*	*$0.0854*	*$0.0848*	*$0.0850*	*$0.0853*	*$0.0855*	*$0.0858*	*$0.0860*	*$0.0863*	*$0.0866*
13	CA Conservation Charge	*$0.0032*	*$0.0031*	*$0.0030*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*	*$0.0028*
14	**Sample Bills**											
15	*Winter Bill*											
16	Winter Hydro Allotment	404	395	390	385	381	376	372	367	363	359	354
17	Total Usage	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405	1,405
18	Basic Service Charge	*$30.60*	*$31.27*	*$31.96*	*$32.66*	*$33.38*	*$34.11*	*$34.86*	*$35.63*	*$36.41*	*$37.21*	*$38.03*
19	Winter Hydro Usage	*$25.67*	*$25.49*	*$25.19*	*$24.94*	*$25.00*	*$25.07*	*$25.15*	*$25.24*	*$25.35*	*$25.45*	*$25.57*
20	Above Hydro Usage	*$87.13*	*$86.86*	*$86.73*	*$86.52*	*$87.12*	*$87.73*	*$88.36*	*$88.99*	*$89.64*	*$90.29*	*$90.96*
21	CA Energy Program	*$4.56*	*$4.30*	*$4.16*	*$3.98*	*$3.96*	*$3.95*	*$3.94*	*$3.93*	*$3.92*	*$3.91*	*$3.89*
22	**Total Bill**	**$147.96**	**$147.91**	**$148.04**	**$148.09**	**$149.46**	**$150.87**	**$152.32**	**$153.80**	**$155.31**	**$156.87**	**$158.46**
23	Annual Winter Bill Escalation	*0.0%*	*0.0%*	*0.1%*	*0.0%*	*0.9%*	*0.9%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
24	*Summer Bill*											
25	Summer Hydro Allotment	757	740	730	721	713	704	696	688	680	672	664
26	Total Usage	2,258	2,258	2,258	2,258	2,258	2,258	2,258	2,258	2,258	2,258	2,258
27	Basic Service Charge	*$30.60*	*$31.27*	*$31.96*	*$32.66*	*$33.38*	*$34.11*	*$34.86*	*$35.63*	*$36.41*	*$37.21*	*$38.03*
28	Summer Hydro Usage	*$44.91*	*$44.65*	*$44.14*	*$43.71*	*$43.88*	*$44.08*	*$44.29*	*$44.53*	*$44.80*	*$45.08*	*$45.38*
29	Above Hydro Usage	*$130.69*	*$130.56*	*$130.53*	*$130.36*	*$131.42*	*$132.48*	*$133.56*	*$134.66*	*$135.76*	*$136.89*	*$138.03*
30	CA Energy Program	*$7.33*	*$6.90*	*$6.69*	*$6.39*	*$6.37*	*$6.35*	*$6.33*	*$6.31*	*$6.30*	*$6.28*	*$6.26*
31	**Total Bill**	**$213.52**	**$213.38**	**$213.32**	**$213.12**	**$215.05**	**$217.02**	**$219.05**	**$221.14**	**$223.27**	**$225.46**	**$227.70**
32	Annual Summer Bill Escalatior	*0.0%*	*-0.1%*	*0.0%*	*-0.1%*	*0.9%*	*0.9%*	*0.9%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*

APPENDIX E:
Needles Historical Rate Schedules

Ten Years of Electric Rates

Winter Rates – October 1 through February 28, 2009	
Basic Service Charge	25.76
Hydro Allotment 446 KWH	0.0906
Over Hydro	.1075
Conservation	.0035

Summer Rates – March 1 through April 30, 2010	
Basic Service Charge	25.76
Hydro Allotment 850 KWH	0.0906
Over Hydro	0.0875
Conservation	.0035

Summer Rates – May 1 through September 30, 2010

Basic Service Charge	25.76
Hydro Allotment 850 KWH	0.0671
Over Hydro	0.0875
Conservation	.0035

Winter Rates – October 1 through January 30, 2011

Basic Service Charge	25.94
Hydro Allotment 400 KWH	0.0876
Over Hydro	0.0908
Conservation	.0037

Summer Rates – February 1 through April 30, 2011

Basic Service Charge	25.94
Hydro Allotment 400 KWH	0.0876
Over Hydro	.1168
Conservation	.0037

Summer Rates – May 1 through August 30, 2011

Basic Service Charge	25.94
Hydro Allotment 753 KWH	0.0844
Over Hydro	.1187
Conservation	.0037

Winter Rates – September 1 through October 31, 2011

Basic Service Charge	25.94
Hydro Allotment 753	0.0844
Over Hydro	.1087
Conservation	.0037

Winter Rates – November 1 through April 30, 2012

Basic Service Charge	26.80
Hydro Allotment 392 KWH	0.0857
Over Hydro	.1133
Conservation	.0037

Summer Rates – May 1 through September 30, 2012

Basic Service Charge	26.80
Hydro Allotment 738 KWH	0.0824
Over Hydro	.1133
Conservation	.0037

Winter Rates – October 1 through February 28, 2013

Basic Service Charge	27.28
Hydro Allotment 391 KWH	0.07730
Over Hydro	.0853
Conservation	.0037

Summer Rates – March 1 through July 31, 2013

Basic Service Charge	27.28
Hydro Allotment 737 KWH	.0773
Over Hydro	.0853
Conservation	.0037
Utility Users Tax	2.5%

Summer Rates – August 1 through September 30, 2013

Basic Service Charge	27.28
Hydro Allotment 737 KWH	.0773
Over Hydro	.1053
Conservation	.0037
Utility Users Tax	2.5%

Summer Rates – October 1 through October 31, 2013

Basic Service Charge	26.21
Hydro Allotment 737 KWH	.0721
Over Hydro	.1027
Conservation	.0036
Utility Users Tax	2.5%

Winter Rates – November 1 through February 28, 2014

Basic Service Charge	27.01
Hydro Allotment 413 KWH	.0721
Over Hydro	.0945
Conservation	.0034
Utility Users Tax	2.5%

Summer Rates – March 1 through June 30, 2014

Basic Service Charge	27.01
Hydro Allotment 778 KWH	.0687
Over Hydro	.0945
Conservation	.0034
Utility Users Tax	2.5%

Summer Rates – July 1 through September 30, 2014

Basic Service Charge	27.01
Hydro Allotment 778 KWH	.0687
Over Hydro	.1145
Conservation	.0034
Utility Users Tax	2.5%

Winter Rates – October 1 through October 31, 2014

Basic Service Charge	27.01
Hydro Allotment 778 KWH	.0687
Over Hydro	.0945
Conservation	.0034
Utility Users Tax	2.5%

Winter Rates – November 1 through February 28, 2015

Basic Service Charge	27.58
Hydro Allotment 370 KWH	.0843
Over Hydro	.1123
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – March 1 through March 30, 2015

Basic Service Charge	27.58
Hydro Allotment 697 KWH	.0804
Over Hydro	.1123
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – April 1 through August 30, 2015

Basic Service Charge	27.58
Hydro Allotment 697 KWH	.0804
Over Hydro	.1148
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – September 1 through October 31, 2015

Basic Service Charge	27.58
Hydro Allotment 697 KWH	.0804
Over Hydro	.1123
Conservation	.0039
Utility Users Tax	2.5%

Winter Rates – November 1 through January 31, 2016

Basic Service Charge	27.88
Hydro Allotment 389 KWH	.0713
Over Hydro	.1007
Conservation	.0039
Utility Users Tax	2.5%

Winter Rates – February 1 through February 28, 2016

Basic Service Charge	27.88
Hydro Allotment 389 KWH	.0713
Over Hydro	.0657
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – March 1 through May 31, 2016

Basic Service Charge	27.88
Hydro Allotment 712 KWH	.0680
Over Hydro	.0657
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates - June 1 through September 30, 2016

Basic Service Charge	27.88
Hydro Allotment 712 KWH	.0680
Over Hydro	.1007
Conservation	.0039
Utility Users Tax	2.5%

Winter Rates – October 1 through December 31, 2016

Basic Service Charge	28.33
Hydro Allotment 411 KWH	.0693
Over Hydro	.0933
Conservation	.0039
Utility Users Tax	2.5%

Winter Rates – January 1 through February 28, 2017

Basic Service Charge	28.33
Hydro Allotment 411 KWH	.0693
Over Hydro	.0459
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – March 1 through March 31, 2017

Basic Service Charge	28.33
Hydro Allotment 751 KWH	.0651
Over Hydro	.0459
Conservation	.0039
Utility Users Tax	2.5%

Summer Rates – April 1 through September 30, 2017

Basic Service Charge	28.33
Hydro Allotment 751 KWH	.0651
Over Hydro	.0933
Conservation	.0039
Utility Users Tax	2.5%

Winter Rates – October 1 through February 28, 2018

Basic Service Charge	28.90
Hydro Allotment 414 KWH	.0660
Over Hydro	.0844
Conservation	.0038
Utility Users Tax	2.5%

Summer Rates – March1 through September 30, 2018

Basic Service Charge	28.90
Hydro Allotment 756 KWH	.0629
Over Hydro	.0844
Conservation	.0038
Utility Users Tax	2.5%

Winter Rates – October 1 through February 28, 2019

Basic Service Charge	29.82
Hydro Allotment 406 KWH	.0652
Over Hydro	.0917
Conservation	.0033
Utility Users Tax	2.5%

Summer Rates – March 1 through September 30, 2019

Basic Service Charge	29.82
Hydro Allotment 742 KWH	.0621
Over Hydro	.0917
Conservation	.0033
Utility Users Tax	2.5%

Winter Rates – October 1 through February 28, 2020

Basic Service Charge	30.60
Hydro Allotment 405 KWH	.0636
Over Hydro	.0872
Conservation	.0032
Power Cost Adjustment	.0207
Utility Users Tax	2.5%

Summer Rates – March 1 through September 30, 2020

Basic Service Charge	30.60
Hydro Allotment 758 KWH	.0594
Over Hydro	.0872
Conservation	.0032
Power Cost Adjustment	.0207
Utility Users Tax	2.5%

APPENDIX F:
Resources

City of Needles Solar PV Determination Application documents and other information submitted to the California Energy Commission Docket
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-BSTD-07.

2019 Time Dependent Valuation Methodology Report
https://efiling.energy.ca.gov/getdocument.aspx?tn=216062.

Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2019 Update to the Title 24 Part 6 Building Energy Efficiency Standards Rooftop Solar PV System.
https://efiling.energy.ca.gov/GetDocument.aspx?tn=222201&DocumentContentId=27371.

2019 Building Energy Efficiency Standards
https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf.

Frequently Asked Questions on the 2019 Solar PV Requirements
https://ww2.energy.ca.gov/title24/2019standards/documents/Title24_2019_Standards_detailed_faq.pdf.