

**Subject** ECWRF Floating Solar Financial Analysis  
**Project** ECWRF Floating Solar  
**Client** City of Petaluma  
**Project No** 18002  
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## 1. Project Summary

The City of Petaluma conducted an RFQ/RFP process in the spring of 2022 which resulted in the selection of White Pine Renewables to provide solar energy to the city with a floating solar array located at the Ellis Creek WRF (ECWRF). Since that selection, modifications to the contract and scope have resulted in pricing adjustments. This memo summarizes the updated financial analysis and is based on the information currently available on the project.

## 2. Interconnection and Production

The project is being interconnected under the PG&E Net Energy Meter Aggregation (NEMA) program. This allows for the system to be connected at one meter and benefits the two meters on site. Projected energy use is based on a full year of interval data combined with the additional energy use from the expected UV and CNG projects.

Address	Annual Energy (kWh)
Existing load - 3890 Cypress Dr (meter # 1010019203)	8,825,771
Existing load - 4400 LAKEVILLE HWY (meter # 1010416696)	126,085
Existing Load - subtotal	8,951,856
Future load - UV 2024	178,000
Future load - CNG 2023	286,000
Projected load (2024)	9,415,856
Solar Generation (2025)	9,074,592

### 3. Financial Analysis

The NV5 financial analysis is based on the White Pine pricing sheet provided on December 8, 2022 summarized in Table 1, industry standard methods and assumptions summarized in Table 2, and current PG&E rates. To be conservative the financial analysis has been conducted on the existing baseline load and has not taken credit for the projected future load increases.

Table 1 Proposal-Specific Assumptions	
Metric	White Pine 1.9% Escalation
PV System Size (kWp)	5,832
PV Yield (kWh/kWp)	1,556
Estimated Production Yr 1 (kWh/yr)	9,075,000
PPA Yr 1 Rate (\$/kWh)	\$0.0962
PPA Escalator (%/yr)	1.9%
PV Production Degradation (%/yr)	0.50%
Performance Guarantee (%)	85%
Guaranteed Production Yr 1 (kWh/yr)	7,713,000
Annual Lease Payment (\$/yr)	\$0
PPA adj. per \$100k add'l interconnection costs (\$/kWh)	\$0.0011
Utility-side Interconnection Costs (\$)	\$309,857
Customer-side Interconnection Costs (\$)	\$174,250
Included consultant fees (\$)	\$300,000
Min. annual array cleanings (#/yr)	2
Daylight hrs scheduled system downtime (hrs/yr)	24
Max. accrued daylight hrs scheduled system downtime (hrs/yr)	72
PPA adj. per add'l annual cleaning (\$/kWh)	\$0.0010
Cost for add'l cleaning, lump sum (\$)	\$15,000
Annual escalation for add'l cleaning, lump sum (%/yr)	2%
PPA adj. per add'l 24 hrs/yr daylight hrs scheduled syst. downtime	\$0.0005
Cost of removal at end of term	\$0

Table 2 Common Assumptions	
Metric	Value
Pre-PV Tariff	SCP B-20P
Post-PV Tariff	SCP B-20P-R
NEM Tariff	NEM 2.0
Utility Annual Escalation (%/yr)	3.00%
Tariff Rate Change Value Risk (%/yr)	-0.60%
Estimated COD	1/1/2024
NPV Discount Rate	2.00%
PPA Term (yrs)	20
Baseline Consumption, 3890 Cypress Dr (1010019203) (kWh/yr)	8,777,000
Baseline Consumption, 4400 Lakeville (1010416696) (kWh/yr)	128,000
Unmonetized REC Value, 2024-27 (\$/MWh)	\$9.50
Unmonetized REC Value, 2028-30 (\$/MWh)	\$6.50

Table 3 summarizes the projected cashflow for not doing the project and the savings derived from doing the project based on the information in Tables 1 and 2.

Table 3 Cash Flow - Annual Net Savings - Proposal Comparison		
Year	Do Nothing Utility Cost (no PV) (\$/yr)	White Pine (\$/yr)
1	\$1,933,000	\$508,000
2	\$1,991,000	\$521,000
3	\$2,051,000	\$535,000
4	\$2,112,000	\$549,000
5	\$2,176,000	\$563,000
6	\$2,241,000	\$580,000
7	\$2,308,000	\$595,000
8	\$2,377,000	\$610,000
9	\$2,449,000	\$626,000
10	\$2,522,000	\$642,000
11	\$2,598,000	\$658,000
12	\$2,676,000	\$675,000
13	\$2,756,000	\$692,000
14	\$2,839,000	\$709,000
15	\$2,924,000	\$727,000
16	\$3,012,000	\$745,000
17	\$3,102,000	\$763,000
18	\$3,195,000	\$782,000
19	\$3,291,000	\$801,000
20	\$3,390,000	\$821,000
<b>TOTAL</b>	<b>\$51.94 M</b>	<b>\$13.10 M</b>

Finally, Table 4 summarizes the holistic savings on a nominal, Net Present Value (NPV), and guaranteed (as outline in the PPA) NPV basis.

Table 4 Cumulative Results - Proposal Comparison	
Metric	White Pine
Cumulative Nominal Savings (\$)	\$13.10 M
NPV Savings (\$, 2022)	\$10.33 M
Min. Guaranteed NPV Savings (\$, 2022)	\$8.77 M

## 4. Risks

The largest financial risks of this project are mosquito abatement costs and future utility rate projections. The city already has substantial mosquito abatement costs at ECWRF. Pond 3 was specifically selected to minimize these costs due to its low mosquito activity. Additionally, similar nearby sites have seen minimal mosquito activity changes and even reductions following the implementation of floating solar projects. To enable similar positive performance City staff and White Pine are collaborating effectively with Marin/Sonoma Mosquito and Vector Control District to minimize these risks and such financial risks are well within the parameters of the projected savings. The risk of utility rates not increasing is relatively small given the historic track record of utility rates. There are many different time periods, utility tariffs, and utilities that this data could be tracked for but considering only the Agricultural industrial tariff the ECWRF is on since 1977 we have seen a 2.84% annual increase in costs. While the model has included 3% it is comparable and certainly extremely unlikely to decline.

## 5. Conclusion

Given the above analysis and considerations, the project is an excellent option for the City to reduce its energy costs with limited financial risk and we strongly recommend they proceed. Further, we recommend the city consider additional solar projects at ECWRF especially as they better understand the impacts to the mosquito population.