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Staff Report

Item # 5

To: Lemoore City Council
From: Lauren Apone, Administrative Analyst
Date: September 12, 2012
Subject: Solar Photovoltaic for Water and Sewer Utilities

Discussion:

In April 2012, Chevron Energy Solutions (CES) approached the City on utilizing solar energy at the well sites to reduce the City's utility cost. Since the City has an existing relationship with CES, they offered to do some preliminary work at no cost with City Staff to develop a proposal to install solar panels at eight (8) sites within the City.

Site/Well No.	Location Description	System Size kWdc
6	North Well Field	259.20
7	North of West Hills College	259.20
10	West of CMC	518.40
11	Lemoore Ave & Glendale Ave	172.80
12	Cedar Lane & Bluejay Ave	518.40
13	East of West Hills College	259.20
Booster Pumps	40 G. Street	108.00
WWTP	Wastewater Treatment Plant	302.40
	Total	2,397.60

These eight sites were selected because the electricity demands of the wells and pumps make it economical for solar arrays. With the increased electricity demands from the arsenic reduction project, these well sites are now using more electricity than when they were first evaluated in 2007 during the previous CES project. In addition, solar costs have decreased since 2007 making it more cost effective. It is estimated that the solar projects will generate 70% of the total electricity consumed at these locations.

Staff was initially concerned that long-term investments at these well sites might not be a good idea because the wells themselves may not last the 30 years and there would be no demand for the solar electricity. After some research, we discovered that PG&E allows for transferring only the generation component of the power from one array to another meter within the City. There is a cost for this transfer, so it is not ideal to construct to that design, but it is a good insurance policy in case one of the sites no longer has any electricity demand.

The preliminary cost for these projects is \$9 million. This would be paid 87% out of the water fund and 13% from the sewer fund. Over a 30 year period, the net energy

savings for the project are projected to be approximately \$25 million. There are several methods of financing solar projects, the two prominent methods being a Power Purchase Agreement (PPA) and a Tax Exempt Lease Purchase Agreement.

A PPA is a service contract, rather than a lease. When the City enters into a PPA, it is agreeing only to purchase the power generated by the system. The PPA provider will own the system, monetize any ownership tax benefits, manage construction finance and be responsible for system maintenance. Typically at the end of the PPA term, the City will have the option to renegotiate/extend the PPA term, acquire the system at a fair market value, or have the PPA provider remove the system. Commonly, at the conclusion of the tax benefit period in year-6, the City will have the option to purchase the system through an Early Buy Out (EBO). The price of the system at this time is generally around 50% of the original purchase price. The advantage to using a PPA is that if the owner of the system is someone other than the City, they will be able to take advantage of tax credits not available to cities and pass the savings on to the City. In this case, the cost of the system in 6 years may not even need to be financed and the City can save interest charges if we have the cash on hand.

A tax exempt lease purchase is a more traditional financing structure. The City would enter into an agreement with a bank who will typically secure the financing using the project as security. The terms for this type of financing vary, but currently 15 year interest rates are around 2.5% to 3%. The payment structure can take into account construction period interest, and payment amounts can be shaped to match net cash flows which can vary over time because of varying incentives, maintenance costs, and energy prices. At the end of the term, the equipment would effectively be paid for, and the end of term purchase is typically transacted with \$1 payment. The projected tax exempt lease purchase financing for this project is attached.

Staff has evaluated the projects and financing structures of various other local governments including City of Kerman, City of Woodlake, and Lemoore Union Elementary School District. We have also compared the PPA and tax exempt lease purchase financing structures for this project and the savings are very close. If Council decides to pursue this project, staff will evaluate the financing options more thoroughly and bring a recommendation back to Council.

The City has worked with CES on two other projects in the recent past. In 2008, the Council authorized a \$3.9 million project for CES to implement:

- Solar systems on roof of Cinnamon Municipal Complex and a solar parking shade structure at the Police Department
- Lighting upgrades at 8 facilities
- Major HVAC upgrades at 2 facilities
- Roof replacement of Cinnamon Municipal Complex
- Wastewater circulation system installation
- Weather based irrigation system installation at four (4) parks

Both the above solar systems are generating at least 10% more energy than what was estimated by CES. In addition, in June 2012, Council authorized CES to replace approximately 1,200 street lights with LED street lights. The project is on schedule.

The purpose of Tuesday's meeting is to determine if Council is interested in doing additional solar projects that will benefit the Water and Sewer funds. If so, staff would

like direction as to whether the Council is interested in continuing to work with CES or if they wish staff to pursue other options. CES and City staff will be available to answer any questions. CES will make the attached presentation to the Council.

Budget Impact:

Chevron will develop the solar project (preliminary engineering, soils analysis of sites, finalize scope, price, savings, and financing) at a \$14,000 cost to the City, payable only if the City does not implement the project. This \$14,000 commitment by Council is necessary to take this project to the next step with CES.

The total estimated cost of the project is \$9 million, which is \$3.75 per watt constructed. Based on the preliminary estimates attached, it is expected that this project, will save over \$125,000 annually in the Water and Sewer Funds after paying for all costs for the first 15 years, and then between \$1 million and \$2 million per year thereafter. Over the 30-year life of the solar project, the Water Fund should see net savings in excess of \$25 million, which is approximately \$13 million in net present value.

Recommendation:

For discussion only.

City of Lemoore Solar Project							
Cash Flow Analysis - 15-Year Tax Exempt Lease Purchase							
Project Price							\$8,991,000
City Contribution							\$0
Construction Period Financing							\$202,298
Amount to be Financed							\$9,193,298
Finance Term							15
Interest Rate							3.00%
Annual Solar Panel Degradation							0.50%
Annual Escalation of Maintenance Cost							3.00%
Annual Escalation of Electricity Cost							5.00%
Year	Energy Savings	Incentives	Total Savings	Maintenance Cost	Lease Payment	Total Costs	Net Savings
Year 1	\$633,825	\$339,903	\$973,728	\$71,928	\$774,764	\$846,692	\$127,036
Year 2	\$662,189	\$338,203	\$1,000,392	\$74,086	\$799,271	\$873,356	\$127,036
Year 3	\$691,822	\$336,512	\$1,028,334	\$76,308	\$824,990	\$901,298	\$127,036
Year 4	\$722,781	\$334,830	\$1,057,611	\$78,598	\$851,977	\$930,575	\$127,036
Year 5	\$755,125	\$333,156	\$1,088,281	\$80,956	\$880,290	\$961,245	\$127,036
Year 6	\$788,917	\$0	\$788,917	\$83,384	\$578,497	\$661,881	\$127,036
Year 7	\$824,221	\$0	\$824,221	\$85,886	\$611,299	\$697,185	\$127,036
Year 8	\$861,105	\$0	\$861,105	\$88,462	\$645,607	\$734,069	\$127,036
Year 9	\$899,639	\$0	\$899,639	\$91,116	\$681,487	\$772,604	\$127,036
Year 10	\$939,898	\$0	\$939,898	\$93,850	\$719,013	\$812,862	\$127,036
Year 11	\$981,959	\$0	\$981,959	\$96,665	\$758,258	\$854,923	\$127,036
Year 12	\$1,025,901	\$0	\$1,025,901	\$99,565	\$799,300	\$898,866	\$127,036
Year 13	\$1,071,810	\$0	\$1,071,810	\$102,552	\$842,223	\$944,775	\$127,036
Year 14	\$1,119,774	\$0	\$1,119,774	\$105,629	\$887,109	\$992,738	\$127,036
Year 15	\$1,169,884	\$0	\$1,169,884	\$108,798	\$934,050	\$1,042,848	\$127,036
Year 16	\$1,222,236	\$0	\$1,222,236	\$112,061	\$0	\$112,061	\$1,110,174
Year 17	\$1,276,931	\$0	\$1,276,931	\$115,423	\$0	\$115,423	\$1,161,508
Year 18	\$1,334,074	\$0	\$1,334,074	\$118,886	\$0	\$118,886	\$1,215,188
Year 19	\$1,393,773	\$0	\$1,393,773	\$122,453	\$0	\$122,453	\$1,271,321
Year 20	\$1,456,145	\$0	\$1,456,145	\$126,126	\$0	\$126,126	\$1,330,019
Year 21	\$1,521,307	\$0	\$1,521,307	\$129,910	\$0	\$129,910	\$1,391,397
Year 22	\$1,589,386	\$0	\$1,589,386	\$133,807	\$0	\$133,807	\$1,455,579
Year 23	\$1,660,511	\$0	\$1,660,511	\$137,821	\$0	\$137,821	\$1,522,689
Year 24	\$1,734,819	\$0	\$1,734,819	\$141,956	\$0	\$141,956	\$1,592,863
Year 25	\$1,812,452	\$0	\$1,812,452	\$146,215	\$0	\$146,215	\$1,666,237
Year 26	\$1,893,559	\$0	\$1,893,559	\$150,601	\$0	\$150,601	\$1,742,958
Year 27	\$1,978,296	\$0	\$1,978,296	\$155,119	\$0	\$155,119	\$1,823,177
Year 28	\$2,066,825	\$0	\$2,066,825	\$159,773	\$0	\$159,773	\$1,907,052
Year 29	\$2,159,315	\$0	\$2,159,315	\$164,566	\$0	\$164,566	\$1,994,749
Year 30	\$2,255,944	\$0	\$2,255,944	\$169,503	\$0	\$169,503	\$2,086,441
Totals	\$38,504,421	\$1,682,605	\$40,187,026	\$3,422,005	\$11,588,136	\$15,010,140	\$25,176,886