City Council Staff Report

Date: March 20, 2013 UNFINISHED BUSINESS

Subject: CITYWIDE ENERGY MANAGEMENT PROJECT

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

On December 14, 2011 City Council approved the Comprehensive Energy Analysis, directed staff to move forward with the work by Chevron Energy Solutions (CES) on the recommended list of Energy Conservation Measures (ECM'S) and with the Third Party review of the Comprehensive Energy Analysis (CEA).

This item provides an update to Council on the status and the details of the above items, presents the results of the Third Party review, presents the financing and cost savings projections of the recommended projects, and requests direction to bring forward the Energy Services Contract for Council approval at the required public hearing.

RECOMMENDATION:

1) Concur in the Third Party's review findings.

2) Concur in the financing payback proposal from Green Campus Partners and direct staff to bring back financing documents.

3) Direct staff to bring forward the Energy Services Contract for Council consideration at the required public hearing.

STAFF ANALYSIS:

CES completed an audit of all City facilities and an analysis of various measures that could be implemented by the City to achieve the most comprehensive energy savings. The main focus of the analysis was the City's two co-gen plants.

In recent years these 30 year old plants have become increasingly unreliable resulting in the plants being out of service an average of 34% of the time over the past 3 years. Major engine repairs/rebuilds were necessary 11 times for both plants costing in excess of $237,000. These

were **unbudgeted** emergency repairs, as were the $19,012 in chiller repairs over the last 2 years. Data (attached) show the costs are likely to increase with time if nothing is done. **It is clear, in staff's opinion, that a proactive resolution to preclude these increasing repair costs is necessary.**

As reported in the CEA, additional program options were analyzed:

1. Do Nothing
2. Abandon Cogeneration and purchase all electricity from Southern California Edison

The analysis showed doing nothing resulted in the following

Pros

- No capital Cost
- No Debt Service

Cons

- Aged equipment needs replacement (25+years)
- High maintenance
- High emissions
- Does not meet sustainability goals
- Increasing down time
- Current operation relies on several older inefficient systems
- Building efficiency doesn't tie back to the central plant operation
- No Renewable Energy Credits

Utility costs were projected to vary from $1.2 million more in the first year to $2.2 million more in year 21 than the recommended Cogen upgrade project.

The conversion to SCE was also not recommended primarily due to the higher energy cost (12¢/kwh vs 8¢/kwh) and the significant modification costs to remove the City facilities from Cogen (Plant modifications, SCE power brought to site, on site electric backbone modifications, on site equipment modification costs) See Table below.

Overview Muni Plant Analysis
Savings as compared to today's Municipal Plant cogen operation.

New Cogen Plant		Abandon Cogen 100% SCE Service	
Annual Utility Savings	$ 329,430	Annual Utility Savings	$(198,903)
Annual O&M Savings	$ 132,796	Annual O&M Savings	$ 257,438
Total Savings	$ 462,226	Total Savings	$ 58,534
20 Year Savings	$13.04MM	20 Year Savings	$ 0.33MM
Capital Cost	$ -8.10MM	Capital Costs	$ -4.9MM
Net Benefit	$ 4.44MM	Net Benefit	$ -4.57MM
Edison Upgrade	$0	Edison Upgrade (Additional Cost)	$ -4MM

Determining which alternative is best for the City requires an understanding of how the co-gen plants operate and provide electricity and heating/cooling to the various buildings they serve. Co-generation is the sequential production of two energy forms, usually steam and electricity, from a single fuel source. In our case, natural gas is used as fuel to run reciprocating engines that turn generators to create electricity. Waste heat (heat created by a running engine) that would normally escape into the air, is recovered from the engines and passed through an absorption chiller to provide cold water for air conditioning. Alternatively, in the winter, waste heat is used to heat water for space heating.

Co-generation was originally selected as the most appropriate alternative energy solution for Palm Springs due to the City's tremendous cooling requirements in the summer. Therefore, a co-gen plant can be a very valuable asset, in that it provides not only electricity for the City's facilities, but through its internal mechanical process, provides thermal energy (heating and cooling).

The 2009/2010 Fiscal Year was chosen for the analysis as the representative base line year, because it provided the best representation of the City's historical operations with plants operating more consistently and with less down time on the more recent years.

Analysis of the Municipal Plant determined that maintaining operation of the co-gen plant is the most economical alternative to providing electricity and heating/cooling to the facilities it serves. The direct cost to generate power through co-generation is less expensive than purchasing electricity from SCE directly ($0.12 per kilowatt hour vs. $0.08 per kilowatt hour). During the last 3 fiscal years, the total power load on the Municipal Plant averaged 10.9 Million kilowatt hours. Given that the direct cost to generate power through co-generation is 67% of the cost to purchase electricity from SCE, it was recommended that the City make certain upgrades to the Municipal Plant to take advantage of the lower direct generation cost and to make the plant significantly more efficient that it is today.

At the Sunrise Plant at Sunrise Park, the co-gen plant distributes power and provides heating/cooling to all of the facilities except the Boys and Girls Club and the Senior Center.

However, the analysis of the Sunrise Plant determined that maintaining operation of the co-gen plant is not the most economic alternative at Sunrise Park. The overall electrical load on the Sunrise Plant is much lower than the load on the Municipal Plant, and since its construction, the Sunrise Plant has produced more power than necessary for the facilities it serves. The balance of electricity produced is sold as excess electricity to SCE at a loss. Therefore, the analysis determined that retiring the Sunrise Plant and purchasing electricity from SCE directly is the most economic alternative for Sunrise Park.

Ultimately the ECM's were reviewed and recommended by the Sustainability Commission in 2011 and subsequently approved by Council included:

- Municipal Co-Generation Plant: replace two existing 650 kilowatt rich burn engines with one 1,135 kilowatt lean-burn engine, replace existing chillers and cooling towers with new efficient equipment and add a new boiler.

- Sunrise Co-Generation Plant: modify the co-generation operation and replace with a new gas and electric cooling and heating hot water plant
- Install a new Energy Management System for City facilities connected to the Municipal and Sunrise Plants
- City-wide lighting retrofit and upgrade (approx. 11,000 interior and exterior fixtures)
- Install remote lighting control and monitoring program for Palm Canyon Drive palm tree and decorative lights
- Install a new automated utility metering and monitoring system at the Municipal Plant
- Contract a CES Energy Resource Manager to manage and monitor the Municipal Plant operation, and monitor implementation of all energy conservation measures to ensure guaranteed energy savings are achieved for a period of 5 years
- Install centralized irrigation control system with weather stations for Parks and other landscape area.

The categories of ECM's selected were:

1. Lighting and Irrigation Control

2. Utility System (Co-gen) Mechanical Improvements

The details of the two categories were spelled out in the attached December 14, 2011 staff report to Council. The direction from Council was to maximize use of ECM's such that the capital costs were paid for by energy savings, which is the proposal presented here.

Tables 1-3 indicates the projected savings and costs by project components. Cost savings were estimated by applying a 4% annual inflation factor to existing energy costs. Table 4 combines the 3 projects which shows an estimated benefit at the end of the year 21 of $2.2 million. It is proposed that the airport and City equally share the costs of the Muni-co-gen plant.

As shown in the two right hand columns of Table 4 the overall general fund savings are projected to be approximately $300,000 at the end of year 21, but as mentioned above, the key is the 71 million kwh saved as shown in the far right hand column. Table 5 includes a 5year sustainability fund contribution which serves to further reduce airport costs as well as general fund co-gen project costs. Overall net program general fund savings is estimated at $1 million as shown in Table 5. **Table 5 is the recommended program.**

Third Party Review:

At the time City Council approved the CEA, they also directed staff to move forward with a Third Party peer review of the ECM's, cost estimates and energy savings, Staff hired Newcomb Anderson McCormick (NAM) who completed their report in summer 2012. The report concluded that the cost estimates were reasonable and the energy savings were also reasonable and in some cases conservative. They also independently justified the recommendation to decommission the Sunrise Plant. Further, the study recommended that the final agreement include validation of the savings in the form of short term billing analysis for select meters. The executive summary of the report is attached.

FISCAL IMPACT:

The estimated costs for the various components of the project are as follows:

Financing Cost Components

Component	Lighting	Water	Sunrise Plant	Muni Plant	Total
Equipment	$3,416,306	$1,022,752	$3,678,876	$9,389,909	$17,507,842
Rebates	(82,407)		(18,114)	(24,181)	(124,702)
Buydown	(40,000)	(40,000)	(340,000)	(20,000)	(440,000)
	3,293,899	982,752	3,320,762	9,345,728	16,943,140
Costs of Issuance	31,653	10,321	34,875	98,151	175,000
Capitalized Interest	226,913	73,990	250,016	703,628	1,254,457
Total Amount Financed	$3,552,465	$1,067,063	$3,605,653	$10,147,507	$18,372,687

There were two proposals for financing the energy upgrade project. The first was from Green Campus Partners, and the second was from Crews and Associates.

The Green Campus Partners proposal was for 20 years (18 operating years plus 2 years for implementation of the program). The Crew and Associates proposal was for 22 years. The extra 2 years of financing do not provide enough cashflow to make a difference in the overall financing costs and we are recommending that the City choose the Green Campus Partners proposal.

The cashflows included with this memo are based on the term, interest rates (3.91%) and costs based on the Green Campus Partners 20 year program. Because the final payment on the financing is scheduled for July 1, 2033, which can be recovered in the operating year 2033/34, we have effectively made the Green Campus Partners proposal payable over 21 years.

The City's financial consultant has reviewed the proposal from Green Campus Partners and found it to be the most responsive to the City's needs Financing over a 20 year period, (2 years of construction and 18 years of debt service) results in the following allocated dept service.

Allocated Debt Service

	Lighting	Water	Sunrise Plant	Muni Plant	Total
2014	$	$	$	$	$
2015	280,000	-	-	-	280,000
2016	182,644	59,557	201,242	566,362	1,009,807
2017	189,020	61,636	208,267	586,131	1,045,054
2018	195,649	63,798	215,571	606,688	1,081,705

2019	202,516	66,037	223,138	627,983	1,119,675
2020	209,660	68,367	231,008	650,134	1,159,169
2021	217,046	70,775	239,147	673,039	1,200,008
2022	224,549	73,222	247,413	696,304	1,241,487
2023	232,383	75,776	256,045	720,596	1,284,800
2024	240,430	78,400	264,911	745,548	1,329,290
2025	248,834	81,141	274,172	771,611	1,375,758
2026	257,742	84,045	283,986	799,231	1,425,005
2027	267,297	87,161	294,515	828,862	1,477,835
2028	277,185	90,386	305,410	859,524	1,532,505
2029	287,490	93,746	316,764	891,478	1,589,478
2030	298,228	97,247	328,595	924,775	1,648,844
2031	309,415	100,895	340,921	959,466	1,710,697
2032	312,070	104,696	353,763	995,606	1,775,134
2033	333,210	108,655	367,139	1,033,252	1,842,256
2034	345,855	112,778	381,071	1,072,462	1,912,166
	$5,120,223	$1,578,320	$5,330,077	$15,009,053	$27,040,672

Pursuant to the City's requirement that the energy and O&M savings pay for the project capital cost, the following Tables, validated by NAM illustrate that savings are projected to cover costs.

O&M Savings

	Lighting	Water	Sunrise Plant	Muni Plant	Total
2014	$ -	$ -	$ -	$ -	$ -
2015	66,080	-	$ -	$ -	66,080
2016	52,610	-	54,722	26,660	133,992
2017	53,392	-	55,639	25,649	134,681
2018	54,195	-	56,579	24,618	135,392
2019	54,986	-	57,514	23,498	135,997
2020	55,799	-	58,473	22,361	136,633
2021	72,078	-	66,301	154,701	293,080
2022	72,954	-	67,107	156,582	296,643
2023	73,865	-	67,944	158,537	300,346
2024	74,649		68,666	160,220	303,534
2025	75,469	-	69,420	161,981	306,870
2026	76,489	-	70,358	164,168	311,015
2027	77,869	-	71,628	167,132	316,630
2028	79,451	-	73,083	170,527	323,061
2029	81,073	-	74,575	174,008	329,656
2030	82,736	-	76,105	177,577	336,418
2031	84,441	-	77,673	181,238	343,352
2032	86,190	-	79,282	184,991	350,463
2033	87,984	-	80,932	188,840	357,756

2034	89,823	-	82,623	192,788	365,234
	$1,452,132	$ -	$1,308,623	$2,516,078	$5,276,832

Energy Cost Savings in $Dollars

	Lighting	Water	Sunrise Plant	Muni Plant	Total
2014	$ -	$ -	$ -	$ -	$ -
2015	284,892	121,222	$ -	$ -	406,115
2016	284,892	121,222	68,537	308,069	782,721
2017	296,288	124,071	71,279	320,392	814,030
2018	308,139	131,114	74,130	333,208	846,591
2019	320,465	136,359	77,095	346,536	880,455
2020	333,284	141,813	80,179	360,398	915,674
2021	346,615	174486	83386	374814	952,301
2022	360,480	153,385	86,722	389,806	990,393
2023	374,899	159,521	90,190	405,399	1,030,009
2024	389,895	165,902	93,798	421,614	1,071,209
2025	405,491	172,538	97,550	438,479	1,114,057
2026	421,710	179,439	101,452	456,018	1,158,619
2027	438,579	186,617	105,510	474,259	1,204,965
2028	456,122	194,081	109,730	493,229	1,253,163
2029	474,367	201,844	114,120	512,958	1,303,289
2030	493,341	209,918	118,684	533,476	1,355,420
2031	513,075	218,315	123,432	554,816	1,409,637
2032	533,598	227,048	128,369	577,008	1,466,023
2033	554,942	236,129	133,504	600,089	1,524,664
2034	577,139	245,575	138,844	624,092	1,585,650
	$8,168,213	$3,475,600	$1,896,512	$8,524,660	$22,064,985

As an integral part of the financing mentioned previously there is a proposed allocation between funds shown in Table 5 that serves to reduce costs to the City General Fund.

- One half of the Co-gen Muni capital cost is charged to the airport as they use half of the energy generated by the plant.
- There is a $700,000 contribution from the sustainability fund used for the first 5 years of the program to pay for the Energy Resource Manager from CES.

Financial Summary

- Estimated capital cost of ECM's -$17.5 Million
- Average annual debt service cost (20yrs 3.91%) $1.35 Million
- Average annual utility savings over 20 yr period $1.37 Million
- The average reduced post project utility expense plus debt service is expected to equal the current average annual utility expense paid by the city in recent years
- The guaranteed savings is in energy, pursuant to the proposed agreement and council direction:
  - 3.6 Million kwh energy saved per year (18%)

- 260,000 Therms saved per year (18%)
- 108 Million gallons of water saved/year (14%)

The program's annual greenhouse gas emission reductions amount to removing 535 passenger vehicles off Palm Springs roadways each year.

The results expected from these projects and updating of City equipment puts the City on the sustainable track that Council has identified for Palm Springs' Future.

SUBMITTED:

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Approved by:

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Attachments:
1. Table 1-5
2. NAM Third Party Peer Review-Executive Summary
3. Co-Gen Unscheduled Repairs
4. December 14, 2011 Staff Report

Attachments to this Staff Report Starts with Page No. 101.

CITY OF PALM SPRINGS

Third Party Peer Review of Energy Conservation Measures, Construction Cost Estimates, and Energy Savings

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July 13, 2012

Newcomb | Anderson | McCormick
ENERGY ENGINEERING AND CONSULTING

SECTION 1:

EXECUTIVE SUMMARY

This report was produced by Newcomb Anderson McCormick (NAM) for the City of Palm Springs. The City of Palm Springs contracted with NAM to provide a third-party peer review of a proposed contract with Chevron Energy Solutions (CES) and provide a review of:

- Energy conservation measures
- Construction cost estimates
- The energy savings associated with these projects
- The financial savings resulting from their implementation

Additionally, through initial discussions with City Staff and the City Council Subcommittee, specific areas of concern and project needs were noted, including:

- The need for the project to address ailing cogeneration systems at the Municipal and Sunrise Plants, which are at the end of their useful lives
- Concerns about the retirement of the Sunrise cogeneration plant
- Concerns over the realization of energy savings from this project, and risk management to protect the City's financial interests, as a loan will be obtained for the work.

Key Findings

- CEA determined to be comprehensive and to adequately address the City's needs
- Guaranteed savings and costs reviewed yield:
  - 3,610,112 kWh saved
  - 250,409 therms/yr saved
  - 144,604 ccf water saved
  - $790,972/yr energy cost savings
  - $18,060,112 Program Cost
  - 22.5 year Simple Payback Period
- Projects have longer payback periods than typically associated with efficiency measures but the scope includes physical renewal measures.
- Projected energy savings found to be reasonable and persistent
- Additional maintenance and non-energy benefits discussed, but not directly claimed in CEA, provide improved economics
- M&V approach generally appropriate, but detailed M&V plans should be developed for approval prior to construction
- Ongoing annual service payments are reasonable

The results of our assessment are presented in the following report. NAM's analysis and recommendations are based on our review of Chevron's Comprehensive Energy Analysis and supporting energy calculations, cost estimates and models provided by Chevron Energy Services, all of which are provided as Appendices to this report.

The Comprehensive Energy Analysis (CEA) identifies twelve individual measures addressing a range of projects including lighting, mechanical, utility sub-metering, water conservation and solar. The proposed suite of measures represents a comprehensive approach, and is in line with the expectations of a proposed program of this nature. Overall, the energy savings for the measures were reviewed and found to be either reasonable, or conservative as presented. Only energy and water savings have been accounted for, with maintenance savings and other non-energy benefits not being claimed in the Executive Summary table (Table 1.1 of the CES CEA), thereby making the overall approach conservative.

The costs were also found to be reasonable, and in line with industry standards for a project delivered through an ESCO guaranteed savings contract. Hard construction costs account for approximately 70% of the total costs. Individual measures were found to be supported with subcontractor quotes obtained by Chevron. It was

determined that CES exercised reasonable diligence to obtain multiple quotes, and obtain the best value solutions for the City. The remaining 30% of the cost constitute program soft costs, which were found to be in line with expectations based on NAM's experience with similar projects. In addition to the $18M project cost, CES also provided details regarding the ongoing annual service payments for review. The ongoing annual costs are approximately 5% on top of the construction cost, and are reasonable.

The reviewed savings and costs from the Comprehensive Energy Analysis are presented below in Table 1.1, and details of each individual measure are discussed in this report. It should be noted that after presentation of the draft report to the City, further detailed review of the financial Pro Forma was requested. Subsequent changes were made to the program, and the updated economics are discussed later in this section.

Table 1.1: Measure Summary (From Comprehensive Energy Analysis)

ECM	ECM Description	Annual Electric Savings (kWh/yr)	Annual Gas Savings (therms/yr)	Annual Water Savings (ccf/yr)	Annual Utility Savings ($/yr)	Construction Cost ($)	Gross Simple Payback (yrs)[2,3]	Program Cost ($)[1]	Estimated Incentive ($)	Net Project Cost ($)	Net Simple Payback (yrs)[3]
L1	Lighting Upgrades - Interior and Exterior Citywide	805,302			$ 120,804				(see subtotal)		
L1-A	Lighting Upgrades - Interior and Exterior Muni	1,251,068			$ 141,204				(see subtotal)		
L1-B	Lighting Upgrades - Interior and Exterior Sunrise	254,972			$ 22,883				(see subtotal)		
L2	Palm Canyon Lighting Control & Remote Monitoring				$ -						
Subtotal	Lighting	2,311,342	-	-	$ 284,891	$ 2,388,763	8.4	$ 3,421,448	$ 79,408	$ 3,342,040	11.7
M1-A	Central Plant Cogeneration Upgrade - Muni	2,809,681	(86,337)		$ 273,347	$ 5,574,549	20.4	$ 7,984,478		$ 7,984,478	29.2
M2-A	Energy Management Control System - Muni	475,968			$ 53,721	$ 817,009	15.2	$ 1,170,209	$ 24,181	$ 1,146,028	21.3
M1-B	Central Plant Upgrade (No Cogen) - Sunrise	(2,128,856)	344,081		$ 34,374	$ 2,075,622	60.4	$ 2,972,933	$ 18,114	$ 2,954,819	86.0
M2-B	Energy Management Control System - Sunrise	168,951			$ 15,163	$ 338,366	22.3	$ 484,644		$ 484,644	32.0
U1	Utility Sub-Metering & Monotoring System				$ -	$ 255,802	n/a	$ 366,388		$ 366,388	n/a
W1	Irrigation/Water Management			144,604	$ 121,222	$ 713,998	5.9	$ 1,022,666		$ 1,022,666	8.4
PV-1A	Solar Photovoltaic - 103kW at Convention Center	155,442			$ 42,817	$ 444,978	10.4	$ 637,346	$ 111,124	$ 526,222	12.3
Total		3,792,528	257,744	144,604	$ 825,535	$ 12,609,086	15.3	$ 18,060,112	$ 232,827	$ 17,827,285	21.6

Notes:

1. Program soft costs were not provided for review by measure, so soft costs are prorated according the construction costs.
2. Simple Payback Period calculations account only for energy savings. Other benefits are not claimed in the CEA.
3. Gross Simple Payback Period accounts for hard construction costs, while net Simple Payback takes program costs and incentives into account.

The total project economics presented here are not specifically shown in the CEA, and were assembled by combining the savings presented in the CEA Executive Summary with the project costs provided independently through the review. Consistent with CES' approach in the energy analysis, these economics do not include the non-energy benefits.

As a result of these figures being obtained from different sources, this is the first time that a project simple payback has been represented to NAM's knowledge. It is worth noting that the simple payback period is longer

than typical for a guaranteed savings contract, and there are two unique circumstances leading to this. First, the proposed mix of projects is heavier on infrastructure related measures than normal. While there are moderate energy savings associated with the central plant and energy management system measures, the payback for these measures are expected to be longer as they are more capital intensive and incorporate more physical renewal, replacing items that are at the end of their lives, which the City will likely have to replace anyway in the next few years. These measures provide additional operational benefits, and provide the infrastructure for long term energy savings, and it is recognized that CES addressed the needs of the City in selecting these measures. The second unique factor is that CES has built in a layer of conservatism by omitting the non-energy benefits from the savings estimates presented in the CEA.

Newcomb Anderson McCormick also performed a review of the Measurement and Verification (M&V) plans, the contract terms with respect to energy savings and risk to the city, and the technical aspects of the individual project. While the overall proposal is reasonable, there are a few minor items that were noted as areas of concern. The following is a summary of the key findings, which are discussed in further detail in this report.

1. The energy savings and implementation cost estimates for both the Municipal and Sunrise Central plant appear reasonable. However, current and future trends in both absolute and relative prices of electricity and natural gas may have significant impacts on the overall ongoing cost savings which should be considered by the City.
2. The smaller load served by the Sunrise Plant was found to justify the decision to decommission the cogeneration system and replace it with a traditional central plant. The fixed costs associated with operating a cogeneration plant outweigh the potential savings due to the size of the plant.
3. The effects of maintenance costs and savings associated with the central plant projects are as significant as the associated energy considerations. While not directly addressed in the CEA, the maintenance cost savings greatly improve the projects' economic benefits. At the same time, maintenance costs should be considered while the City decides whether to keep cogenerating at the Municipal Plant.
4. The scope for the EMS upgrade should be clarified with regards to the Airport to reconcile an apparent conflict between Attachment D and Attachment C of the CEA. The impact of this is minimal on energy savings, but should be clarified.
5. The incentives estimates appear to be reasonable and are appropriate as presented. It was noted that incentives claimed for the lighting measure are based on the Express rebates available from Southern California Edison (SCE). Higher incentives may be available through Customized Incentives offered through the Partnership with SCE, which the City may want to consider.
6. The M&V approaches are reasonable as proposed (with caveats listed below for the irrigation controls and the Sunrise Central Plant), but detailed M&V plans should be provided to the City for review and approval prior to start of construction.
7. Greenhouse Gas (GHG) legislation (State Assembly Bill AB32) was initially anticipated to affect the future operation of the City's cogeneration systems. However, through further investigation at the City's request, it was determined that the City of Palm Springs is not a "Regulated Entity" and it appears that the impacts of AB32 will be minimal.
8. The Irrigation Controls measure is proposed as a stipulated savings measure. The savings are based on a rule of thumb claim, and were not substantiated with solid engineering calculations. While the 30% savings estimate is not unreasonable, it is recommended that some validation of the savings be required in the form of short term billing analysis for a select number of meters. The savings should be evident immediately, and Chevron has agreed in principal to discuss this with the City.
9. Chevron is proposing that a stipulated savings M&V approach be used for the Sunrise Plant project. This

approach at first appears reasonable since the estimated savings are relatively small. However, the overall energy quantities under consideration are large, which include the total electricity use and natural gas use at the plant. Since a significant portion of the savings derives from "fuel switching", relatively minor changes in these overall quantities can have large effects on the savings. For this reason, NAM recommends that an International Performance Measurement and Verification Protocol (IPMVP) Option C M&V approach be used for this measure.

10. The review of the contract terms relative to the energy savings and performance guarantees revealed several articles or provisions that relate to construction management control mechanisms, mechanisms for calculation of savings and risk to the City relative to the strength of the savings guarantee. NAM recommends these be addressed prior to contract execution.

Upon presentation of the draft report to the City of Palm Springs, the City requested additional review of the financial Pro Forma as presented by Chevron Energy Services based on the CEA. The City subsequently requested that the solar measure be removed from the scope of work, and that the program pricing and Pro Forma be revised accordingly.

NAM reviewed the Pro Forma provided by CES. As noted above, the CEA is conservative in that it omits non-energy related savings. The Pro Forma analysis, however, does take the credit for non-energy operations and maintenance savings obtained from the project. Another major component of the Pro Forma analysis not included in the CEA are avoided cost escalation factors, which led to projections of higher savings in later years of the project life. Yet another factor included in the Pro Forma are costs associated with project financing. A detailed discussion of CES's assumptions supporting the Pro Forma is presented in Section 3.4.

The assumptions put forth by CES within the Pro Forma analysis are not unreasonable, and are adequately explained. However, unlike the energy savings associated with the project, the non-energy operations and maintenance savings will not be guaranteed and will not be measured and verified. Since the non-energy savings are treated differently, NAM has generated a "worst-case" scenario, alternative Pro Forma analysis, that can be used to evaluate the uncertainty of possible outcomes. The "worst-case" version altered some of the Pro Forma assumptions regarding operations and maintenance savings to reflect a more conservative outlook.

Once the final version of the Pro Forma Analysis was submitted to NAM, Measure PV-1A "Solar Photovoltaic - 103kW at Convention Center" had been removed from the proposed Project. The following Table shows the overall Project reflecting the removal of that measure.

Table 1.2: Measure Summary (from Pro Forma)

ECM	ECM Description	Annual Electric Savings (kWh/yr)	Annual Gas Savings (therms/yr)	Annual Water Savings (ccf/yr)	Annual Utility Savings ($/yr)	Construction Cost ($)	Gross Simple Payback (yrs)[2,3]	Program Cost ($)[1]	Estimated Incentive ($)	Net Project Cost ($)	Net Simple Payback (yrs)[3]
L1	Lighting Upgrades - Interior and Exterior Citywide	805,302			$ 120,804				(see subtotal)		
L1-A	Lighting Upgrades - Interior and Exterior Muni	1,251,068			$ 141,204				(see subtotal)		
L1-B	Lighting Upgrades - Interior and Exterior Sunrise	254,972			$ 22,883				(see subtotal)		
L2	Palm Canyon Lighting Control & Remote Monitoring				$ -						
Subtotal, Lighting		2,311,342	-	-	$ 284,891	$ 2,388,763	8.4	$ 3,438,155	$ 79,408	$ 3,358,747	11.8
M1-A	Central Plant Cogeneration Upgrade - Muni	2,809,681	(86,337)		$ 273,347	$ 5,574,549	20.4	$ 8,023,466		$ 8,023,466	29.4
M2-A	Energy Management Control System - Muni	475,968			$ 53,721	$ 817,009	15.2	$ 1,175,924	$ 24,181	$ 1,151,743	21.4
M1-B	Central Plant Upgrade (No Cogen) - Sunrise	(2,128,856)	344,081		$ 34,374	$ 2,075,622	60.4	$ 2,987,450	$ 18,114	$ 2,969,336	86.4
M2-B	Energy Management Control System - Sunrise	168,951			$ 15,163	$ 338,366	22.3	$ 487,011		$ 487,011	32.1
U1	Utility Sub-Metering & Monotoring System				$ -	$ 255,802	n/a	$ 368,177		$ 368,177	n/a
W1	Irrigation/Water Management			144,604	$ 121,222	$ 713,998	5.9	$ 1,027,660		$ 1,027,660	8.5
PV-1A	Solar Photovoltaic - 103kW at Convention Center	Measure removed from project at this time									
Total		3,637,086	257,744	144,604	$ 782,718	$ 12,164,109	15.5	$ 17,507,842	$ 121,703	$ 17,386,139	22.2

Notes:

1. Program soft costs were not provided for review by measure, so soft costs are prorated according the construction costs.
2. Simple Payback Period calculations account only for energy savings. Other benefits are not claimed in the CEA.
3. Gross Simple Payback Period accounts for hard construction costs, while net Simple Payback takes program costs and incentives into account.

City Council Staff Report

Date: December 14, 2011 UNFINISHED BUSINESS

Subject: CITYWIDE ENERGY MANAGEMENT PROJECT

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

On May 18, 2011, staff presented to Council a recommended list of energy conservation measures ("ECMs") to be included in the overall Citywide energy management project. At that time, Council deferred action on confirming the list of ECMs. Subsequently, on July 20, 2011, staff presented the Comprehensive Energy Analysis ("CEA") of all City facilities completed by Chevron Energy Solutions ("CES"), a subsidiary of Chevron USA, Inc. CES is the City's energy services company (or "ESCO") for this project.

Staff is providing an update of the recommended list of ECMs and requesting Council direction on a scope of the overall energy management project with which staff can continue to pursue with CES.

Staff will return early next year to Council for your consideration of a performance contract which will clearly define all of the project costs, project financing, utility savings and guarantees. The performance contract recommended for Council approval will have been thoroughly reviewed by an independent third party consultant retained by the City to confirm the reasonableness of project costs, verify CES's baseline utility costs and assumptions, verify CES's estimated utility savings, and validate the ability of the project to be self-funded through the utility savings resulting from implementation of the project.

RECOMMENDATION:

1) Direct staff to move forward with Chevron Energy Solutions on the recommended list of Energy Conservation Measures to be included in the scope of the overall Citywide energy management project; and
2) Approve the Comprehensive Energy Audit ("CEA") submitted by Chevron Energy Solutions dated July 20, 2011; and
3) Direct staff to move forward with an independent third party review of the Citywide energy management project.

STAFF ANALYSIS:

For a detailed history and prior staff analysis of the energy management project, please refer to copies of the July 21, 2010; May 18, 2011; and July 20, 2011, staff reports included as Attachments to this report.

The energy management project may be grouped into three distinct categories related to:

1) Lighting system and irrigation control retrofits
2) Utility system (Co-Gen) mechanical improvements
3) Solar Photovoltaic Systems

Category 1: Lighting System & Irrigation Control Retrofits

With regard to Category 1, CES has identified and recommended that the City pursue retrofit and upgrade of approximately 14,000 interior and exterior light fixtures Citywide. Lighting retrofit projects are the most common and least expensive ECM to implement. Implementing this ECM is estimated to result in the following:

Energy Reduction: **2,088,358 kWh**
Energy Savings: **$264,687 Annually**
Cost: **$2.7 Million**

Related to Category 1, CES has also identified and recommended that the City pursue implementation of a centralized irrigation control system with a centrally located weather station for its parks and other landscaped areas. Currently, there are 75 water meters providing irrigation to the City's parks and landscaped areas – accounting for over 500 million gallons of consumed water per year (73% of the City's total water consumption). This total excludes any reclaimed water consumption at the City's golf courses. Installation of smart controllers that automatically update the watering schedule will allow for changes in water needs as dictated by the actual weather conditions throughout the year. Controllers will be fined-turned to the actual conditions of the City. In addition to smart controllers, existing irrigation heads will be fitted with proper nozzles, and inoperative irrigation heads will be replaced to provide uniformity of irrigation throughout the City. Implementing this ECM is estimated to result in the following:

Energy Reduction: **108,163,785 gallons of water**
Energy Savings: **$121,222 Annually**
Cost: **$975,000**

These two ECM's related to Category 1 are the easiest to implement, and it is staff's recommendation that Council approve these ECMs as part of the Citywide energy management project.

Category 2: Utility System (Co-Gen) Mechanical Improvements

With regard to Category 2, it is necessary to separately consider the two different Co-Generation Plants operated by the City, as the stories related to these two co-generation plants are very different.

Municipal Plant

The Municipal Plant behind City Hall provides electricity, and heating/cooling to the Airport, Fire Station No. 2, City Hall, and the Police Station. Approximately 280,000 square feet of floor space is dependent upon the Municipal Plant for utility service. During the 2009/2010 fiscal year, the total power load on the Municipal Plant was 10.9 Million kWh. Also, with the Airport, Fire Station No. 2, and Police Station buildings connected to the Municipal Plant, there is a sizeable amount of energy demand on a 24-hour/day – 7-days/week ("24/7") cycle. Given the high electric consumption and 24/7 operation of the facilities served by the Municipal Plant, the analysis continues to recommend that maintaining a co-generation operation for the Municipal Plant is the most cost effective solution. This recommendation is primarily based on the following factors:

1. The direct cost to generate power through co-generation at the Municipal Plant is less expensive than purchasing electricity from SCE directly ($0.12 per kWh vs. $0.08 per kWh)[1]
2. Co-generation provides not only electricity for the City's facilities, but through its internal mechanical process, provides thermal energy (heating and cooling). Abandoning co-generation would require the City to spend $4.9 Million for all new boilers and chillers to supply heating/cooling at each of the City's facilities which would increase the City's energy consumption in order to operate this new equipment.
3. All of the City's facilities provided with electricity by the Municipal Plant are connected to a system owned by the City – not SCE. In order to abandon co-generation and connect directly to SCE's grid, SCE would require installation of separate electric meters at each City building. This would require extension of underground electrical infrastructure by SCE to each point of connection at the buildings, at an estimated cost of $4 Million.

[1] Utility costs are from the 2009/2010 fiscal year (the baseline year) during which the City's cost to purchase natural gas averaged $6.57 per Dekatherm. The City just recently entered a one-year contract to purchase natural gas at a rate of $4.72 per Dekatherm – the lowest rate in 10 years. At this rate the City's cost to generate power through co-generation is further reduced to $0.06 per kWh – approximately half the cost to purchase electricity directly from SCE.

In reviewing a 20 year life-cycle analysis for the Municipal Plant, it has been determined that upgrading the Municipal Plant with a new generator engine to continue self-generating power is the most cost-effective solution. Specifically, the life-cycle analysis for upgrading the Municipal Plant with a new co-generation system shows:

• Annual Utility Savings	$329,430
• Annual O&M Savings	$132,796
• Total Annual Savings	$462,226
• 20 Year Savings	$13.04 Million
• Capital Cost of New Plant	-$8.6 Million
• Net Benefit	$4.4 Million
• Measurement & Verification	$167,211 average annual cost first 5 years

As a result of CES's analysis, it is recommended that the City upgrade the existing Municipal Plant by replacing the existing 650 kW engine set with a single 1,135 kW natural gas burning (lean-burn) engine with a 450 ton cooling/4,606 MBtu double effect absorption chiller, and two new 2 Million Btu boilers (combined 3.4 Million Btu output) to supplement heating/cooling of the City's facilities. The size of the engine recommended (1,135 kW) best follows the City's electrical load pattern, allowing the engine to operate at its most efficient capacity. A lean-burn engine is also 25% more efficient than the existing engine set the City operates today. These recommendations will allow the City to provide up to 850 tons of instantaneous cooling load and an 8 Million Btu heating load at minimum operating cost.

While the Municipal Plant upgrade will address the "supply side" of the City's energy conservation effort, it is equally important to address the "demand side" of the equation. Therefore, in addition to the Category 1 lighting system retrofits, it is critical that the City implement an energy management controls system to integrate the City's facilities with the Municipal Plant operation. Currently, the City's facilities all have individual controls for lighting and heating/cooling ("HVAC") systems – many of which are very outdated and operate on a 24/7 basis even if the space is not continuously used. To realize the greatest energy efficiencies, a full retrofit to replace existing controls with electric controls as part of a centralized energy management system ("EMS") ensures the City's facilities and the Municipal Plant operate in unison, with capabilities to remote access the operation of the various lighting and HVAC systems, and to implement the most efficient use of these systems based on actual use of the room or building.

Based on these facts, it is staff's recommendation that Council approve this ECM as part of the Citywide energy management project.

Implementing this ECM is estimated to result in the following:

Annual Electric Energy Savings:	**3,326,220 kWh**
Annual Gas Energy Savings:	**(93,672) Therms (Increased cost)**[2]
Total Energy Savings:	**$329,430 Annually**
Cost:	**$8.6 Million**

It should be noted that the City's Airport is a significant user of energy generated by the Municipal Plant. For the 2009/2010 fiscal year (the baseline year for the Comprehensive Energy Audit), the Airport consumed over 50% of the total energy produced by the Municipal Plant. Included with the Municipal Plant improvements is a new automated utility metering system which will give the City capability to provide real-time power demand and energy use by the Airport. Through the City's Internal Service Fund, the Airport is billed for its energy consumption, which offsets a significant portion of the costs incurred in generating power at the Municipal Plant.

Sunrise Plant

The Sunrise Plant at Sunrise Park provides electricity, and heating/cooling to the Leisure Center, Library, Pavilion, Palm Springs Stadium, and Swim Center. Approximately 70,000 square feet of floor space is dependent upon the Sunrise Plant for utility service. During the 2009/2010 fiscal year, the total power load on the Sunrise Plant was 2.7 Million kWh. Unlike the Municipal Plant, at the Sunrise Plant there is very little energy demand on a 24-hour/7-day a week cycle. Given the modest electric consumption and primarily 7 AM to 7PM energy use, the analysis recommends as the most cost effective solution that the City retire the co-generation operation at the Sunrise Plant and modify the plant to operate as an electric plant (distributing electricity provided by SCE as done today when the co-generation engine is not operating) modified with new heating/cooling equipment. This recommendation is primarily based on the following factors:

1. The co-generation engines *must* operate on a 24/7 cycle to run at their most efficient peak capacity; given the fact that most of the facilities do not generate an electric load on a 24/7 cycle, excess electricity has historically been generated by the Sunrise Plant which is sold to SCE. Although the direct cost to generate power through co-generation at the Sunrise Plant is less expensive than purchasing electricity from SCE directly ($0.16 per kWh vs. $0.09 per kWh), excess power is

[2] This ECM results in an increase of natural gas used due to the fact that the proposed engine will be operating more consistently throughout the year (assumed 11 months of every year), as opposed to the current engine set which is prone to mechanical problems and operates inconsistently and was often not operating 5 months every year. This shows the energy shift, away from purchasing electricity from SCE at higher rates when the engines are not operating, to purchasing more natural gas to self-generate electricity at lower rates.

sold to SCE at the rate of $0.04 per kWh. Based on these rates, the City should not operate the Sunrise Plant whereby it generates excess power to be sold to SCE.

2. The average baseline electric load on the Sunrise Plant is approximately 350 kW, a total load that is on the lower end of a plant to be operated by a generator engine. The limited size ranges of today's generating equipment would require the City to invest in a new generator engine with a capacity that exceeds the baseline electric load.

In reviewing a 20 year life-cycle analysis for the Sunrise Plant, it has been determined that the significant capital cost and on-going operation and maintenance costs of a new generator engine exceed the benefits of self-generating power. Specifically, the life-cycle analysis for replacing the Sunrise Plant with a new co-generation system shows:

• Annual Utility Savings	$74,899
• Annual O&M Savings	$60,193
• Total Annual Savings	$135,092
• 20 Year Savings	$3.7 Million
• Capital Cost of New Plant	-$5.1 Million
• Net Cost	-$1.4 Million

Due to the smaller size and load requirements of the Sunrise Plant, it is recommended that the City upgrade the existing Sunrise Plant by removing the existing 650 kW engine and abandon co-generation and simply operate a central plant taking power purchased directly from SCE and distributing it via the existing City-owned electrical infrastructure throughout Sunrise Park. Additionally, to maintain the City's ability to provide heating/cooling to the City's facilities within Sunrise Park, it is recommended that a modern, high efficiency 250 ton electric chiller and two new 2 Million Btu boilers be installed at the Sunrise Plant. The new equipment will take advantage of the existing Thermal Energy Storage ("TES") system. Traditional TES is a load shifting strategy that involves making and storing chilled water at night (when the lowest electric rates apply), and then utilizing the chilled water as the main cooling source during the day. It is a very effective way of reducing demand capacity of the electric system by reducing chiller loads during peak periods.

While the Sunrise Plant upgrade will address the "supply side" of the City's energy conservation effort, it is equally important to address the "demand side" of the equation. Therefore, in addition to the Category 1 lighting system retrofits, it is critical that the City implement an energy management controls system to integrate the City's facilities with the Sunrise Plant operation. Currently, the City's facilities all have individual controls for lighting and heating/cooling ("HVAC") systems – many of which are very outdated and operate on a 24/7 basis even if the space is not continuously used. To realize the greatest energy efficiencies, a full retrofit to replace existing controls with electric controls as part of a centralized energy management system ("EMS") ensures the City's facilities and the Sunrise Plant operate in unison, with capabilities to remote access the

operation of the various lighting and HVAC systems, and to implement the most efficient use of these systems based on actual use of the room or building.

Based on these facts, it is staff's recommendation that Council approve this ECM as part of the Citywide energy management project.

Implementing this ECM is estimated to result in the following:

Annual Electric Energy Savings:	**(1,959,905) kWh (Increased cost)**[3]
Annual Gas Energy Savings:	**344,081 Therms**
Total Energy Savings:	**$32,816 Annually**
Cost:	**$3.4 Million**

Category 3: Solar Photovoltaic Systems

With regard to Category 3, there were two solar photovoltaic systems previously proposed to Council:

1. 103 kW solar system at the Convention Center
2. 439 kW solar system at Sunrise Pavilion Parking Lot

Convention Center

As part of its direction to staff at the May 18, 2011, Council meeting, the Council authorized staff to apply to the California Solar Incentive Program to secure $111,124 in Performance Based Incentives for a solar system at the Convention Center. Staff has applied for and secured this incentive in the event Council proceeds with implementing a solar system application at the Convention Center.

As outlined to Council on May 18, 2011, the proposed 103 kW solar system at the Convention Center would be constructed on the roof of the building, and although unseen by the public a real-time electronic display would be installed at a location inside the Convention Center to showcase generation of solar power at the facility. A solar system installed over the entire roof area of the Convention Center would generate approximately 1,344,000 kWh annually. However, the cost of a solar system of that size is approximately $4.5 Million and would only generate 60% of the 2,220,000 kWh used by the Convention Center in 2010.

[3] This ECM results in an energy shift, away from self-generating electricity through natural gas co-generation to purchasing electricity from SCE. Given the fact that the Sunrise Plant generates too much electricity (at a cost of $0.09 / kWh) with excess sold back to SCE (at a rate of $0.04 / kWh), continuing to operate the Sunrise Plant results in a net overall cost to the City, and it is more economical to abandon co-generation at the Sunrise Plant as recommended.

The size of the system is recommended as it is the smallest system that qualifies for the SCE renewable energy rate reduction, R-Rate (to qualify, at least 15% of the current overall energy demand at the Convention Center must be provided by the solar system). A larger solar system is not being recommended as the capital cost of the solar system is significant.

The capital cost of a 103 kW solar system at the Convention Center is approximately $600,000. Considering this cost separately, if financed over 20 years at 4.75% the annual debt service would be approximately $46,500. The 103 kW solar system can generate 155,442 kWh of power, equivalent to $42,817 in utility savings. Thus, the 103 kW solar system at the Convention Center is very close to a net-neutral cost ECM, in that it can be paid for from savings. However, the 103 kW solar system generates only a small amount of the total energy used at the Convention Center, and will not offset a majority of its total SCE utility charges ($330,000 in 2010).

Based on the fact that this ECM is merely a net-neutral cost, it is Council's choice whether or not to approve this ECM as part of the Citywide energy management project.

Implementing this ECM is estimated to result in the following:

Energy Reduction: **155,422 kWh**
Energy Savings: **$42,817 Annually**
Cost: **$600,000**

Sunrise Pavilion Parking Lot

The proposed 439 kW solar system to be installed at Sunrise Park was proposed on new shade structures within the Pavilion Parking Lot. The shade structures with solar panels would provide covered parking and an opportunity to self-generate solar power. A solar system at Sunrise Park would be beneficial in that it would offset the total power load on the Sunrise Plant, however, the high capital cost of a 439 kW solar system exceeds the utility savings that result.

The capital cost of a 439 kW solar system at the Sunrise Pavilion Parking Lot is approximately $2.7 Million. Considering this cost separately, if financed over 20 years at 4.75% the annual debt service would be approximately $209,500. Although, the 439 kW solar system can generate 661,814 kWh of power, equivalent to $69,613 in utility savings, the 439 kW solar system at the Sunrise Pavilion Parking Lot is not a net-neutral cost ECM, and cannot be paid for from savings. Based on this fact, it is staff's recommendation that Council not include this ECM as part of the Citywide energy management project.

Project Benefits

The benefits of implementing all of the recommended energy conservation measures as a single energy management project include:

- Energy Reduction = 3.6 Million kWh = 18% reduction of total energy used
- Annual Electric Savings = $499,690
- Solar Generation = 155,442 kWh
- Natural Gas Reduction = 250,409 Therms = 18% reduction of total natural gas used
- Annual Gas Savings = $170,060
- Water Savings = 108 Million Gallons = 10% reduction of total water used
- Annual Water Savings = $121,222

Additionally, this program will provide new energy efficient equipment for the City's antiquated energy systems, and replace equipment currently in service that is beyond its useful life.

FISCAL IMPACT:

Implementation of all of the ECMs recommended for approval is estimated at $16,275,000. Using a financing rate of 4.75% over 20 years requires an annual debt payment of approximately $1 Million. As shown on the table on the following page, according to CES's analysis, after implementation of all of the ECMs, approximately $1.2 Million in utility and O&M savings will be realized and will offset the annual debt service required to pay for construction.

This was the underlying factor of this project – that it would be a "paid from savings" project requiring no upfront capital investment.

As the City would incur additional debt to pay for this project (paid from energy and O&M savings), the City will be required to maintain existing budget levels for utility and O&M costs. According to CES's analysis, after the project is implemented the reduced utility costs will result in a surplus of funds from which the debt service is paid. The key issue here is that, although savings are realized, those savings pay for the project. Therefore, moving forward on an annual basis the City will need to maintain its current budget levels for utility costs to ensure the savings are available to pay the debt service. As a condition of a performance based contract with CES, CES will guarantee that these savings occur for a five year period.

The guarantee occurs through a Measurement and Verification program implemented by CES as part of the performance contract. Over the first 5 years of this program at an average cost of $167,211 annually, CES will monitor and verify the lighting system upgrades, the Municipal Plant and energy management control system operation, and

solar photovoltaic system operation to ensure that the efficiencies in energy generated from the new equipment are achieved.

Energy usage, facility operational changes, gas costs and utility rates are dynamic and must be closely monitored to ensure that energy savings guaranteed are achieved. CES's proposal is to guarantee the savings of the installed program. To provide project savings reports, detailed ongoing measurement and evaluation must be completed. CES's Measurement & Verification Program provides constant monitoring of the implemented ECM's to verify savings, and ensure the City's compliance with state requirements for solar incentives. Monitoring of systems will be performed on a daily basis and an Energy Resource Manager provided by CES will be onsite 20 hours per week to verify that installed equipment is operating as guaranteed.

Annually, CES will prepare a report that identifies the actual utility costs incurred and compare them to utility costs that were estimated to occur absent implementation of the energy management project. This will clearly identify if, and to what degree, the estimated utility savings were achieved. In the event utility savings are not achieved, CES guarantees the savings by modifying or replacing installed equipment at their cost as may be necessary to achieve the guaranteed savings. Ultimately, if CES is unable to achieve the guaranteed savings, CES provides the City cash payments equivalent to those savings to make up the difference.

The following table identifies the City's various utility related costs for the 2008/2009 to 2011/2012 fiscal years:

YEAR	Electricity	Gas	Water	Co-Gen O&M	Total
08/09	$1,769,830	$1,421,833	$618,180	$589,849	$4,399,692
09/10	$1,594,605	$838,147	$632,731	$582,167	$3,647,648
10/11	$1,681,721	$693,470	$706,969	$639,157	$3,721,318

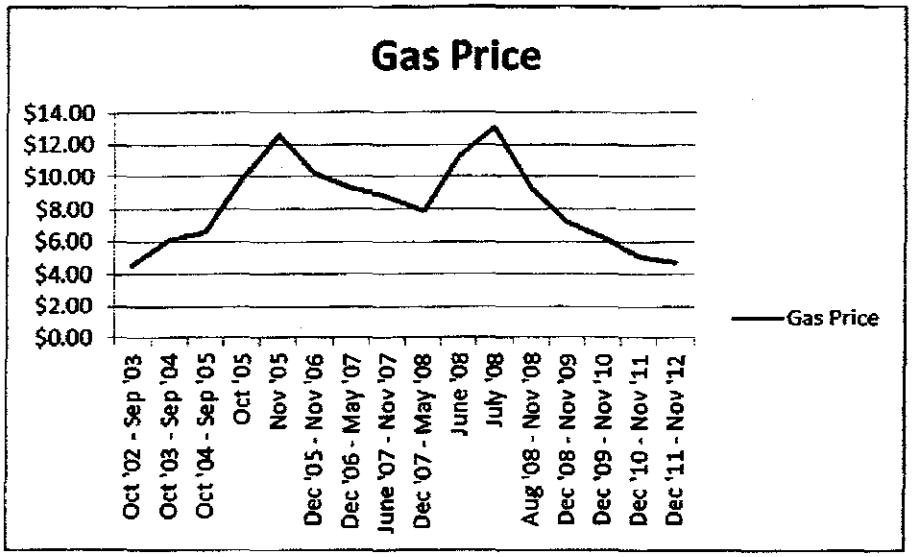
What the above Table identifies is the fact that overall utility costs have decreased since the 2008/09 fiscal year, primarily due to the significant decrease in natural gas prices. Annual electricity costs have fluctuated at an average of $1,682,052 over the three year period, and will continue to escalate in the future as utility rate increases are implemented.

The Comprehensive Energy Analysis used the 2009/10 fiscal year as a baseline model year, and determined (from the SCE and natural gas utility rates in effect at that time) that implementing the recommended package of ECM's will result in the following utility savings:

	Electricity	Gas	Water	Co-Gen O&M	Total
Savings	$499,690	$170,060	$121,222	$361,671	$1,152,643

The total annual savings achieved by implementing this project will be sufficient to pay the debt service on the total capital cost of the project.

The 2009/10 fiscal year was a good representation of the City's operations, considering that in that fiscal year the Municipal Plant's engines operated more consistently than in the 2010/11 and current fiscal year. Although utility savings from the baseline year factored the City's average cost for natural gas of $6.57 per Dekatherm, and the City just entered into a one-year contract on purchase of natural gas at a lower rate of $4.72 per Dekatherm, the 2009/10 fiscal year remains an appropriate baseline year given the historic volatility of the natural gas market. As shown in the Chart below, the natural gas price has varied from a low of $4.56 during the 2002/2003 fiscal year to a high of $13.06 in July 2008.



The following table is specific to the Municipal Plant, and identifies how its costs were distributed by Fund:

YEAR	Airport 415	MVR 510	Facilities 520	Total
08/09	$1,750,832	$97,228	$946,323	$2,794,383
09/10	$1,593,121	$92,158	$776,587	$2,461,866
10/11	$1,546,377	$92,505	$885,858	$2,524,740

As shown in the Table above, the Airport's portion of Municipal Plant costs averages 63% of the total cost to generate power at the Municipal Plant, consistent with its total use of energy. As the single largest user of energy from the Municipal Plant, the improvements to be made to the Municipal Plant will allow the City to more efficiently generate power for the Airport, and significantly reduce the amount of excess power purchased from SCE (at a much higher rate) required to satisfy the Airport's high energy demand, particularly in the summer.

Following Council's approval of the list of ECMs to be included in the scope of the overall Citywide energy management project, staff will work with CES to finalize the guaranteed fixed price to design-build all of the improvements. CES's proposal will subsequently be reviewed by a third party to verify that all of the proposed costs are reasonable with industry standards, that the resulting utility and O&M savings are appropriate, and that the performance contract proposed by CES establishing the financial terms to the City for financing construction and implementation of the project is supported.

After a competitive consultant selection process, staff has retained Newcomb Anderson McCormick, Inc., to provide the third party independent review of this project. Their contract fee, not to exceed $25,000, will be paid from the Sustainability Fund (account 138-1270-43200).

Following the independent third-party review of the financial terms of the CES's performance contract, if the baseline assumptions and estimated savings are verified, staff will schedule Council approval of the performance based guaranteed fixed price contract with CES (estimated by April 2012).

This project will be financed directly between the City and a financial institution of the City's choosing; CES, or its parent corporation Chevron, Inc., will not finance this project. CES recovers its costs for the engineering phase through the construction contract, and as the General Contractor will include an appropriate overhead margin on its administration. The overhead margin and all other terms and conditions of CES's performance contract will be reviewed by the independent third-party consultant. The performance contract's terms and conditions will be outlined in a future staff report to Council at the time it is scheduled for approval.

The action taken at this time does not commit the City to constructing any of the measures recommended for approval; it merely confirms for CES the scope of the energy management project from which they can seek bids and finalize their performance contract for City approval. However, in the event the Council determines not to proceed with the energy management project, pursuant to the terms of the current agreement between the City and CES approved by Council on July 21, 2010, the City is obligated to pay CES a project fee of $250,000 as payment for its costs to develop and complete the Comprehensive Energy Audit ("CEA") filed with the City Council on July 20, 2011, in which the recommended ECMs have been identified. In that case, the reports, analysis and recommendations outlined in the CEA would remain the property of the City for our reference in any future energy management project.

SUBMITTED:

Prepared by:

Marcus L. Fuller
Assistant Director of Public Works

Recommended by:

David J. Barakian
Director of Public Works/City Engineer

Approved by:

Thomas J. Wilson, Asst. City Manager

David H. Ready, City Manager

Attachments:

July 21, 2010; May 18, 2011; and July 20, 2011, staff reports

City Council Staff Report

Date: July 21, 2010 NEW BUSINESS

Subject: APPROVAL OF A PROFESSIONAL SERVICES AGREEMENT WITH CHEVRON ENERGY SOLUTIONS COMPANY, A DIVISION OF CHEVRON U.S.A., INC., FOR THE CITYWIDE ENERGY MANAGEMENT PROJECT, CITY PROJECT NO. 09-05

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

On June 17, 2009, the City Council approved the release of a Request for Statements of Qualifications (SOQ #11-09), for Energy Management Services. In keeping with the City Council's endeavor to implement sustainability measures throughout the City, the City's SOQ solicited qualifications from firms that specialize in analyzing the energy efficiency of buildings and equipment, and to determine a range of solutions to implement that result in energy cost savings which may be used to offset the capital expense of implementing those energy efficiency measures.

Following a competitive, technical two-part qualification process, Chevron Energy Solutions ("CES"), a subsidiary of Chevron USA, Inc., was selected as the most qualified Energy Services Company ("ESCO") for this project.

RECOMMENDATION:

1. Approve Agreement No. _____ with Chevron Energy Solutions, a division of Chevron USA, Inc., for energy management services for the Citywide Energy Management Project (City Project 09-05); and

2. Provide direction on the use of energy savings (maximization of general fund savings versus maximization of energy efficiency measures paid for with energy efficiency savings); and

3. Provide direction on the use of solar photo-voltaic power at the Airport and City Hall parking lots as one available option to generate additional power to meet demand.

STAFF ANALYSIS:

Background

The City of Palm Springs owns, operates, and maintains a variety of facilities throughout the City, ranging from fire stations, libraries, a Convention Center, a police station, an airport, recreation facilities, as well as two co-generation power plants. The cost to operate and maintain all of these various facilities is a substantial burden to the City's General Fund.

The 2010/2011 fiscal year budget set aside significant General Fund revenue for operation and maintenance of the City's various facilities. Departments budget a "Facilities Maintenance Service" fee, which is used to offset operation and maintenance expenses for the City. In the 2010/2011 fiscal year, the City budgeted approximately $3,500,000 for Facilities Maintenance Service fees to offset its operation and maintenance expenses for the year, which covers building maintenance and repairs, co-generation plant special parts and repairs, and utilities (water, gas and electricity).

The 2010/2011 fiscal year budgeted $480,000 for electricity, and $1,470,000 for natural gas for the City's two co-generation plants. Of the $1,470,000 budgeted for natural gas, $1,015,000 is budgeted for the Municipal co-generation plant, and $455,000 is budgeted for the Sunrise co-generation plant.

To address the City's high energy costs, staff previously prepared a Request for Statements of Qualifications (SOQ) which states the following purpose:

> *The City of Palm Springs is requesting statements of qualifications (SOQ's) from qualified energy services companies ("ESCOs") to provide the city with Energy Management Services to provide a Comprehensive Energy Audit (CEA) to develop a set of programs that will be combined as a performance-based single energy project with the intended purpose to save energy, reduce greenhouse gas emissions and cut the City's energy and maintenance and capital equipment expenditures throughout all of the City's facilities, including two co-generation plants.*

The selected ESCO will perform an audit of all of the City's facilities to ensure appropriate HVAC (heating, ventilation and air conditioning) measures are identified (such as upgrading thermostats, installing programmable lighting sensors, etc.), with more important attention given to the co-generation plants to identify cost-effective solutions to improving their performance while decreasing their operating and maintenance costs. Although the purpose of the SOQ was to find the most qualified firm to provide energy management services City-wide, the focus of the ESCO's attention will be given to evaluating the City's co-generation plants, to make them more energy efficient, given they satisfy a majority of the City's energy demands.

Consultant Selection Process

On June 17, 2009, the City Council approved of the release of the SOQ, and authorized the City Manager to appoint an Evaluation Committee to review and recommend the most qualified ESCO responding to the City's solicitation. The Evaluation Committee appointed by the City Manager consisted of:

Jan Anderson, Facilities Maintenance Manager
David Barakian, Director of Public Works/City Engineer
Marcus Fuller, Asst. Dir. of Public Works/Asst. City Engineer
Wil Kleindienst, Architectural Advisory Committee Member
Michele Mician, Manager of Sustainability
Mark Nichols, Sustainability Commissioner
Doug Wylie, Sustainability Commissioner

Although the SOQ was advertised locally in *The Desert Sun*, staff researched listings of ESCOs registered in the state, as well as national registrations, and made efforts to outreach to all recognized ESCOs that could be found. Due to the highly technical nature of this project, with its focus on co-generation technology, staff did not expect or anticipate that small local vendors would respond to the SOQ. However, a local preference criterion was included in the SOQ to give a primary firm an advantage for including local firms as part of their team.

The firms initially responding to the City's SOQ were:

- Ameresco; Upland, CA
- Chevron Energy Solutions; Pasadena, CA
- FPT Group; San Diego, CA
- JCI – Building Efficiency; Milwaukee, WI
- SIEMENS Building Technologies; Cypress, CA
- Veolia Energy; Diamond Bar, CA

The Evaluation Committee reviewed the documents submitted by the 6 firms, and independently evaluated the firms based on the criteria included in the SOQ. The Evaluation Committee met and discussed the qualifications of the firms, and ultimately determined that 5 of the 6 firms warranted further evaluation (FPT Group was disqualified pursuant to the criteria established in the SOQ).

As the solicitation requests services that are highly technical in nature, staff prepared a second step to the evaluation process, where firms were required to respond to a technical exercise to provide the City with an example of the nature, quality and extent of their technical services. Firms were required to prepare a technical memorandum discussing opportunities to address the energy challenges represented by the City's two co-generation plants, as well as water supply demands at Sunrise Park. Instructions

and parameters of the second phase of the solicitation process were provided to the firms.

Four of the five firms that passed the initial evaluation process agreed to proceed to the second step of the evaluation process (Veolia Energy elected not to continue with the solicitation process). The final four firms participating were:

- Ameresco; Upland, CA
- Chevron Energy Solutions; Pasadena, CA
- JCI – Building Efficiency; Milwaukee, WI
- SIEMENS Building Technologies; Cypress, CA

The required technical memoranda were submitted to the City by the March 29, 2010, deadline, and on April 29, 2010, final interviews were conducted with each of the four firms. The Evaluation Committee, after reviewing the technical memoranda and conducting the formal interviews, by a near-unanimous decision, selected Chevron Energy Solutions as the most highly qualified firm for this project.

Why Chevron?

One of the first issues the Evaluation Committee addressed in selecting Chevron Energy Solutions ("CES") is the potentially negative association of Chevron USA (its parent company) with the environment, and how or why CES may be the best firm to address energy efficiency issues for Palm Springs in its efforts to become more sustainable and energy independent. On this issue, CES was best prepared, and offers the following facts for the City's consideration:

- Largest California – based ESCO
- Chevron owns, operates and maintains over 3,100 MW of co-generation plants
- Largest solar provider in California's public sector (over 30 MW installed)
- Fortune 3 company with over 130 years in California backing performance guarantees
- 98.7% success rate in achieving energy management project savings in a current portfolio of $430 million in performance guarantees
- Successful placement of over $1.250 billion in combined project financing for customer performance contracts
- Provides unbiased recommendations – vendor neutral
- Has corporate commitment to Palm Springs' Path to Sustainability

First and foremost, Chevron is an energy company. As a company that uses California's natural resources to produce energy, Chevron bears a special responsibility for California's environment. Their corporate environmental vision and the City's environmental vision are aligned.

Chevron is committed to energy efficiency and conservation, actions that Chevron makes every day. To raise public awareness of the impact even small steps can contribute, Chevron launched the "I will" campaign; a public outreach campaign to highlight awareness for energy efficiency. For more information, visit their website: www.willyoujoinus.com

CES partners with businesses and institutions to help lower their overall energy costs in ways that improve their financial performance. Through energy efficiency, energy management and power system solutions, CES helps customers use less energy, pay less for energy, and ensure reliable, high-quality power for critical operations.

CES also provides the energy efficiency best practices and technical expertise to its parent company, Chevron, at facilities around the world. Because energy costs are Chevron's third largest expense, CES is focused on saving energy, saving the environment and saving money, all from an owner's perspective. On an annual basis, CES saves Chevron nearly $100 Million by implementing energy efficient operations at Chevron's facilities.

The Evaluation Committee was impressed with CES's commitment to energy efficiency, its extensive experience in the public sector on performance based and financially guaranteed energy management projects, and by a near-unanimous decision, the Committee determined CES to be the most qualified firm to provide the City with the required services.

Palm Springs' Journey into Power Generation
A History of the Co-Generation Plants

In May 1985, the City of Palm Springs began to supply its energy needs through the use of two co-generation plants. The larger of the two plants (the "Municipal" co-generation plant) generates electricity, heating and air conditioning for the City's Municipal Complex: a group of government buildings consisting of the City Hall, Police Station, Fire Station No. 2, Airport and Riverside County administration buildings. The smaller of the two plants (the "Sunrise" co-generation plant) generates electricity, heating and air conditioning for the Sunrise Plaza, the City's recreational center consisting of the library, entertainment pavilion, administrative offices and community swimming pool.

Spiraling utility costs forced the City to examine alternative energy sources. Although the City instituted strict energy conservation measures in 1980, the City was paying $1.3 Million in energy costs in 1984, double what was paid in 1978. At the time, many alternative sources of energy were studied: methane recovery, hydro power, geothermal energy, wind resources, solar energy, and co-generation. Of all of these alternative sources of energy studied, the co-generation process was determined to be the best process for the City.

Co-generation is the sequential production of two energy forms, usually steam and electricity, from a single fuel source. In our case, natural gas is used as fuel to run reciprocating engines that turn generators to create electricity. Waste heat (heat created by a running engine) that would normally escape into the air, is recovered from the engines and passed through an absorption chiller to provide cold water for air conditioning. Alternatively, in the winter, waste heat is used to heat water for space heating and hot water needs. Co-generation proved to be the most appropriate alternative energy solution for Palm Springs due to the City's tremendous cooling requirements in the summer.

Facility Facts, Municipal Co-Generation Plant:
- Two 650 kW engine/generator sets
- 360 tons of absorption chilling capacity
- 400,000 gallon thermal energy storage (TES) tank
- 3 miles of underground electrical and thermal distribution lines

Facility Facts, Sunrise Co-Generation Plant:
- One 650 kW engine/generator set
- 130 tons of absorption chilling capacity
- 137,000 gallon thermal energy storage (TES) tank
- 1 mile of underground electrical and thermal distribution lines

The two co-generation plants initially cost $6,292,691 (including planning, engineering, legal fees, etc.). This cost was financed through the City's sale of Certificates of Participation from the City's Public Facilities Corporation, in the amount of $11,820,000 on April 1, 1984. This bond sale also included $2.5 Million for construction of the new police station.[1]

At the time the co-generation plants were constructed, they were intended to accommodate 100% of the City's energy needs at the Municipal complex and Sunrise recreation area. (All other City facilities not connected to the co-generation plants remain dependent on SCE for electricity). The City expected to use only 50%-55% of the electricity generated by the co-generation plants, with excess sold to SCE, anticipating that the co-generation plants would generate $16 Million in excess electricity sales to SCE over 20 years following construction.

For the Sunrise co-generation plant, the City realizes the sale of excess electricity generated year-round. The electrical load on the Sunrise co-generation plant is slightly

[1] The original bonds were scheduled to mature in 2006, but in 1996 the outstanding debt on these bonds was consolidated with other debt being carried on several facilities, extending the maturity date for the bonds to 2026.

less than half its capacity (300 kWh[2] of the 650 kWh generated). From July 1, 2007, to June 30, 2008, the City realized $137,243.14 in electricity sales to SCE from the Sunrise co-generation plant.

For the Municipal co-generation plant, the story is somewhat different. Following the City's expansion of the Airport, the total energy demand on the Municipal co-generation plant significantly increased; (expansion of the Airport was not considered in the original design of the Municipal co-generation plant). The energy demand has increased so much so, that, in the summer months the co-generation plant is unable to generate electricity to meet our energy demands. Whereas the two 650 kW engine/generator sets are capable of generating 1,300 kW of electricity, in the summer the total electrical load is 300 to 400 kW more than the 1,300 kW that can be produced.

This fact requires the City to purchase additional electricity from SCE. The 2010/2011 fiscal year budget allocates over $1,200,000 for electricity from SCE. Of this total, $400,000 is budgeted for additional electricity for the Municipal co-generation plant (due to the inability of the plant to meet the electrical load demand imposed by the Airport); $80,000 is budgeted for electricity for the Sunrise co-generation plant (to allow the plant to go off-line for annual maintenance); $220,000 is budgeted for electricity for traffic signals and street lighting; and the balance is budgeted for electricity at various facilities throughout the City.

Why not abandon the co-gen plants?

The City's investment in the co-generation technology is significant, and staff does not recommend that the City consider abandoning the co-generation plants (particularly considering the fact that the City continues to carry outstanding debt on its initial construction). Furthermore, to abandon the City's generation of power would require significant investment (in excess of several million dollars) to install SCE owned infrastructure to connect all of the municipal facilities to the SCE grid, as SCE would not likely consider the City's electrical distribution grid equal to theirs.

The co-generation plants have tremendous value to the City, and although the Municipal Co-Generation Plant can not currently meet the City's total energy demand (particularly due to the Airport), measures can be taken to improve the efficiency of the plant, to increase its power output, and to eliminate the need to purchase excess electrical power from SCE.

How to address the Municipal Co-Generation Plant's inability to meet the City's total energy demand was one of the specific issues CES was required to address as part of

[2] The unit "kWh" refers to the amount of power, expressed in terms of 1,000 watts (i.e. kilowatts), generated in one hour. Therefore, a 650 kWh engine can generate 650,000 watts of power in one hour.

the second phase of the solicitation process. In CES's technical memorandum, CES estimated that $430,000 may be saved annually through a combination of energy efficiency and conservation measures (new lighting controls, energy efficient lights, new efficient HVAC equipment, energy management system, etc.), and making improvements to the co-generation plant. Specifically, CES's initial recommendations are to replace the existing 650 kWh engines with "lean-burn" engines, or lean combustion reciprocating engines that meet much more strict air quality control requirements. CES estimates that lean-burn engines will produce 25% more power than the existing 650 kWh engines with the same amount of fuel consumption.

Another component to CES's initial strategy to address the City's challenges at the Municipal Co-Generation Plant is to increase the size of the existing Thermal Energy Storage (TES)[3]. Generally, the 400 kW of excess power demand from the Airport is due to the large air conditioning load at the Airport during the summer. By doubling the size of the TES, an additional 700 tons of cooling for four hours a day would help satisfy the shortfall in cooling at the Airport while eliminate the peak load shortfall of 400 kW.

Staff expects CES will be able to assemble a successful energy management project that, with certain mechanical changes to the Municipal Co-Generation Plant, will enable the City to once again meet the energy demand placed upon it by the municipal facilities that rely on it for energy.

Solar Power

One available component of a successful energy management project is photovoltaic power self-generation. It has already been demonstrated that the Municipal Co-Generation Plant's engines do not produce sufficient power to meet peak demand; however, installing new engines to meet the peak demand may not be the most cost effective, or sustainable option. There are opportunities in and around the City Hall and Airport (particularly the parking lots) where solar shade systems and solar roof-mounted systems could be considered as a means to supplement power generated by new engines in the Municipal Co-Generation Plant. CES's initial recommendation indicated in their technical memorandum included self-generation of 750 kW of solar power. CES estimates that, with 750 kW of solar power combined with new lean-burn engines at the Municipal Co-Generation Plant, the City can reduce its natural gas consumption by 45% (a savings of approximately $450,000), and also eliminate the need to purchase excess electricity from SCE (estimated at $400,000 this fiscal year).

A critical decision for City Council to consider is the installation of solar power facilities in and around City Hall and the Airport. The best opportunity for solar power facilities is

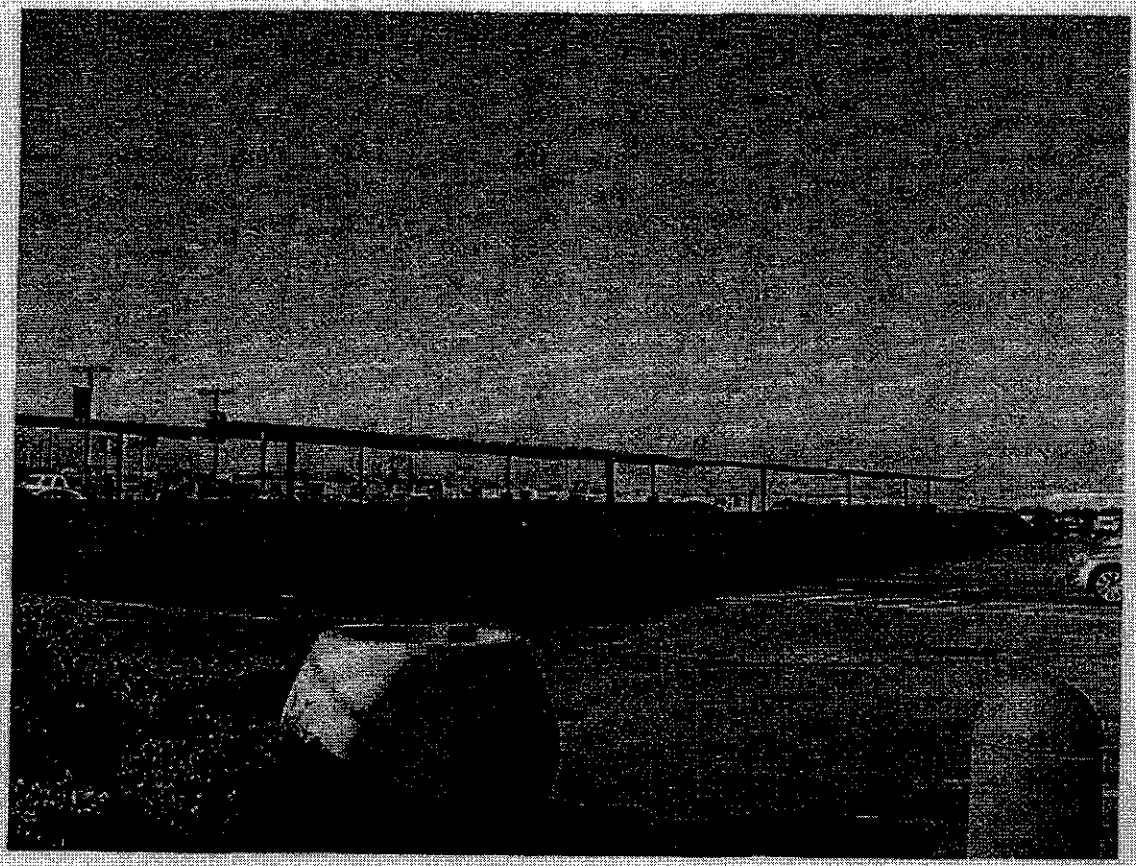
[3] A Thermal Energy Storage (TES) system is a giant underground cold water storage tank; when buildings need cold water for air conditioning, it is taken from the storage tank and circulated through the buildings for cooling, then returned to the storage tank where it is continuously chilled by the absorption chillers within the co-generation plant.

installation on raised steel shade systems (i.e. shade structures) within the City Hall and Airport parking lots. This system provides "free" shade to parked cars, and could provide additional revenue for the Airport for increased fees for covered parking. However, given the historic designation of the City Hall and Airport, further consideration of installing solar power facilities at parking lots around these facilities will only be pursued if the City Council provides staff with general direction on limitations where these structures should or should not be placed.

CES has prepared visual simulations of solar panels with covered parking shade structures that may be installed in and around the City Hall and Airport, seen below:

Photo Simulation 1 (Airport Short-Term Parking Lot)

Photo Simulation 2 (Airport Rental Car Parking Lot)



It is also recommended that CES include analysis of solar power generating facilities at the City's wastewater treatment plant. The 2010/2011 fiscal year budget for the Wastewater Fund budgeted $210,000 for electricity to operate pumps and equipment at the treatment plant. Installation of solar panels in available open space within the wastewater treatment plant may prove to be more cost-effective at generating electrical power than the using methane (bio-gas) naturally produced as a bi-product of the wastewater treatment process.

Ultimately, the final recommendation to include or exclude solar power from the menu of options to include in the energy management project will be based on the overall cost-effectiveness of the entire project.

How will the City pay for this?

The state of California enacted special legislation in Government Code 4217.10 – 4217.18 in 1984, as a result of an energy crisis, as a way to assist local agencies in

expediting and financing energy conservation measures. This statutory procedure eliminates the necessity to separately contract for the design and construction phases of a project, as well as eliminates the public bidding process.

This project will use this legislation to the City's fullest advantage. The legislation encourages public agencies to develop energy conservation, cogeneration and alternative energy supply sources at public facilities in order to implement the policy of the State of California as set forth in Public Resources Code 25008, which states its intent:

> *"...to promote all feasible means of energy and water conservation and all feasible uses of alternative energy and water supply sources."*

The legislation further states:

> *"The provisions of this chapter shall be construed to provide the greatest possible flexibility to public agencies in structuring agreements entered into hereunder so that economic benefits may be maximized and financing and other costs associated with the design and construction of alternative energy projects may be minimized. To this end, public agencies and the entities with whom they contract under this chapter should have great latitude in characterizing components of energy conservation facilities as personal or real property and in granting security interests in leasehold interests and components of the alternative energy facilities to project lenders."*

What this legislation does is allows the City to sole-source an energy conservation project to an individual firm, provided the energy conservation project has the following results:

(1) The anticipated cost to the public agency for thermal or electrical energy or conservation services provided by the energy conservation facility under the contract will be less than the anticipated marginal cost to the public agency of thermal, electrical, or other energy that would have been consumed by the public agency in the absence of those purchases; and

(2) The difference, if any, between the fair rental value for the real property subject to the facility ground lease and the agreed rent, is anticipated to be offset by below-market energy purchases or other benefits provided under the energy service contract.

Many local agencies have used this legislation to implement energy conservation measures at their facilities that otherwise would not be implemented due to fiscal constraints. With the implementation of energy efficiencies, various local agencies have seen reductions in their energy use and costs, and have been able to replace old equipment that has had high operational and maintenance costs. The up front capital costs normally necessary for construction and implementation of energy conservation

projects is financed and offset by the corresponding energy efficiency and conservation savings that result from the project.

Therefore, there will be no out-of-pocket expense for the City to pursue design and construction of the energy management project, which will be financially guaranteed by CES through a performance based contract based on the final energy management project selected by the City that results in energy efficiency savings City wide.

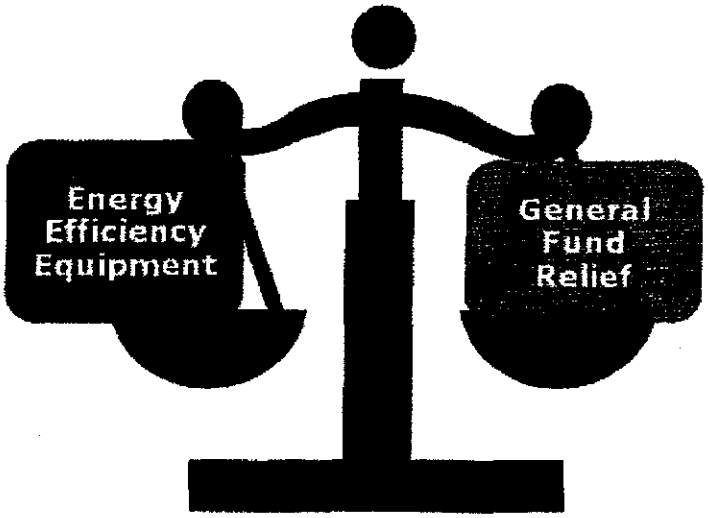
General Fund Savings vs. Energy Efficiency Measures

A critical issue to consider is what the City Council's expectation is for the results or outcome of an energy management project ultimately developed by CES in consultation with staff. Given the City's current economic crisis and on-going budget deficits, staff understands the need to find General Fund savings wherever possible. Thus, this energy management project is vital to ensuring the City is spending its money wisely. Currently, given the inability of the City's Municipal Co-Generation Plant to meet peak power demand, and the outdated HVAC and lighting equipment throughout facilities City-wide, the City is spending money to produce power while spending even more money to buy power. Measures can be implemented to eliminate this practice and to make the City much more efficient in its use of resources, its generation of power, and reduce its overall dependence on electricity and natural gas.

Because the energy management project is self-funded by the energy efficiency and conservation measures implemented, the overall scope and cost of the project is dictated on exactly how much savings is estimated and how those savings are used.

In simpler terms, the City can choose to use all of its energy savings to pay for construction of energy efficiency and conservation measures City-wide, where the City ultimately pays nothing for the benefit of reducing its overall energy use and being much more efficient and sustainable in its practices than it is today. Or, the City can choose to use only as much of its energy savings to implement those energy efficiency and conservation measures determined to be most cost-effective (such as improving the efficiency of the Municipal Co-Generation Plant), while reserving the remaining savings to be used at the City's discretion as pure General Fund realized savings.

The following graphic demonstrates the choice to be made:



CES will be tasked with developing a cost-effective, self-funded energy management project, where all of the costs for design and construction are financed through annual energy savings realized by those measures. The question is: does the City Council want the most energy efficiency measures implemented resulting in less realized General Fund savings for discretionary use, or a project limited to only those energy efficiency measures deemed critical resulting in more realized General Fund savings for discretionary use?

For the most part, there will be certain mechanical and equipment costs which will be necessary (new HVAC equipment, lighting systems, energy management systems, etc.). The most expensive component of the energy management project will likely be related to the new engines for the co-generation plants, and expansion of the Thermal Energy Storage (TES) systems which will provide the greatest energy efficiencies available to the City. The question on this matter, of "it would be nice to have" vs. "we must have" is particularly related to installation of solar power facilities in and around the City Hall and Airport parking lots. Installing solar power on flat-roofs is common, but can lead to complications especially given older roofs prone to leaking, or roof tops that have miscellaneous equipment that can not be removed or relocated without great expense. The easiest method to install solar power facilities in our case would be by constructing shade structures in parking lots, and it is the cost of the shade structures (and related parking lot improvements) that add to the overall cost of the solar power generation system which ultimately must be paid for by the energy savings resulting from the system. It is the capital costs of the shade structures and parking lot improvements related to the solar power generating facilities that would ultimately reduce the overall General Fund savings that might otherwise be available in the absence of any solar power facilities.

CES can provide a range of opportunities, with a variety of solar power generating sizes, in the menu of items to include in the final energy management project. If the City Council ultimately determines that solar power should be a critical element of the overall energy management project, it will be important to choose a system of appropriate size where it is cost effective to construct the system and it generates sufficient power, as opposed to merely constructing a very small system as a token effort to include solar power in the project at a high cost with relatively little solar power generated from it.

What happens from here?

This project will consist of two phases. The first phase of the project begins with the City Council's approval of the agreement with CES. CES will begin to perform full audits of all City facilities to determine power use and demand, facility use, inventory existing HVAC and lighting equipment, and evaluate measures to implement that will reduce energy costs and improve energy efficiency. CES will work collaboratively with City staff to identify appropriate measures to include or exclude, and will identify the most cost-effective measures to implement that result in the shortest pay-back for the City. The result of the first phase will be a proposal for a "Design-Build" project, where CES, acting as the general contractor, assembles a construction project for a fixed-fee on a performance based contract, funded solely from energy savings resulting from the project.

The second phase of this project will begin with the City Council's review and approval of a performance based contract, which if approved, would implement and construct all of the energy efficiency measures recommended by CES in consultation with the City.

What does this cost?

There is no fee associated with the proposed agreement with CES, with the expectation that CES will identify an energy management project that is cost-effective, reflects the scope of work requested by the City, results in significant energy savings which in turn pay for the performance based contract to implement and install the energy efficiency measures. However, in the event CES identifies an energy management project that can be self-funded through energy savings, and the City Council determines not to proceed with the project, the City would be liable for the fixed design fee of $250,000.

A performance based contract is an agreement between CES and the City, under which CES develops and implements facility improvements at no up-front cost to the City. CES assures the City a minimum level of energy savings from energy efficiency measures and helps the City secure financing based on that assurance. Over the contract period the savings from reduced utility bills are used to pay back the capital investment in the equipment, installation, and related financing fees. No City funding is required up front – all project performance and savings risks are shifted to CES, with excess savings to be used at the City's discretion. CES's financial guarantees assures

the City that if energy savings to finance the project are not realized, CES will pay the City the difference, and will take steps to modify or otherwise improve the project (at their cost) to realize the savings they had estimated would be achieved.

Is this the right time to do this?

CES is a highly qualified ESCO providing energy management services to public agencies throughout California, with special expertise on co-generation technology. CES's initial investigation based on the technical exercise performed during the evaluation process revealed that the City's energy management project might be one of the most energy efficient projects CES has developed.

CES's preliminary assessment is that the City's project may result in up to a ***38% reduction in overall energy use***, equivalent to the following significant environmental benefits:

CO_2 Reduction = 6,193 metric tons
Cars Offset Annually = 1,184
Homes Powered Annually = 752
Acres of Trees Saved = 1,321

Every day the City does not implement energy efficiency measures is a day that the City spends excess funds for energy resources that are not required. It is staff's recommendation that the City Council approve the agreement with CES to allow staff to coordinate on the development of the most cost-effective energy management project that can realize the goal of up to a 38% reduction in overall energy use, and ultimately help the City realize the environmental benefits and General Fund savings that would result.

FISCAL IMPACT:

There is a project development fee of $250,000 for this project. However, CES assumes the risk of developing a cost-effective energy management project that is self-funded by the energy savings resulting from its implementation. If CES cannot develop a paid-for project, no matter how much effort undertaken by CES, there is no cost to the City and the project development fee is waived. However, if CES develops a paid-for project for the City, the project development fee is included as part of the overall cost of the energy management project implemented through the performance based contract paid for by the energy savings. In the event CES develops a paid-for project and the City determines not to implement the project, the City would be liable to pay CES its project development fee at that time.

Given the results of CES's preliminary assessment, it is anticipated that an energy management project resulting in significant energy savings will be developed, and as such, the project development fee of $250,000 will be absorbed as part of the energy

management project's overall cost paid for by those savings. Therefore, on the basis that the City Council will remain committed to the policies set forth in the *Palm Springs Path to Sustainability*, and will support implementation of a performance based contract to construct the energy management project, there will be no "up front" cost to the City for the services provided by CES, as they will be offset by energy savings.

SUBMITTED:

Prepared by:

Marcus L. Fuller
Assistant Director of Public Works

Recommended by:

David J. Barakian
Director of Public Works/City Engineer

Approved by:

Thomas J. Wilson, Asst. City Manager

David H. Ready, City Manager

Attachments:

1. Agreement

City Council Staff Report

Date: May 18, 2011 NEW BUSINESS

Subject: CITYWIDE ENERGY MANAGEMENT PROJECT

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

On July 21, 2010, following a competitive, technical two-part qualification process, the City Council awarded Chevron Energy Solutions ("CES"), a subsidiary of Chevron USA, Inc., a professional services agreement for this project. Subsequently, CES has performed energy audits of all of the City's facilities, and completed its recommendations for a Citywide energy management project. On April 19, 2011, the Sustainability Commission reviewed the list of energy conservation measures ("ECMs") to be included in the overall Citywide energy management project, and has recommended the City Council approve the project which implements the most ECMs possible to be paid from savings. Following the Council's concurrence with the Sustainability Commission's recommendation, or an alternative recommendation by Council, staff will coordinate with CES to finalize the scope of the energy management project, confirm construction costs and prepare a performance based guaranteed fixed price contract for future Council review and approval.

RECOMMENDATION:

1) Review and approve the list of Energy Conservation Measures to be included in the scope of the overall Citywide energy management project; and

2) Authorize the City Manager to submit an application and pay applicable fees (estimated at $15,000) to the California Solar Incentive Program as may be necessary to secure as much as $600,000 in Performance Based Incentives and $282,000 in renewable energy credits for the photovoltaic systems (if included in the scope of the overall Citywide energy management project).

STAFF ANALYSIS:

Since the City Council's approval of a contract with CES on July 21, 2010, CES has performed an audit of all City facilities (for a complete list, see Attachment 1), and

completed analysis of various measures that could be implemented by the City to achieve the most energy savings possible. A significant amount of effort has been completed to analyze the City's co-generation plants, interior and exterior lighting systems, heating and cooling systems, and irrigation systems throughout all City facilities. CES has identified a list of measures that were reviewed and recommended for approval by the Sustainability Commission at its April 19, 2011, meeting.

The primary purpose of this project is to evaluate the City's co-generation plants, and to recommend cost effective improvements that enable the plants to run more efficiently, and to reduce the City's overall energy consumption. Other primary goals are:

- Lower electric consumption
- Reduce water consumption
- Lower green house gases
- Reduce natural gas consumption
- Achieve the City's adopted Sustainability Goals
- Develop a "paid from savings" project requiring no capital contribution from the City, and paid for entirely with energy and operation & maintenance ("O&M") savings resulting from implementation of the ECMs.

CES analyzed the City's two co-generation plants to determine what alternatives would best suit the City today, given its current energy demands and utility costs. For each of the co-gen plants, CES analyzed the following alternatives:

- Continue existing co-gen operations – do nothing approach
- Replace existing co-gen engines with new lean-burn engines
- Abandon co-gen operations and purchase all electricity from SCE
- Retire co-gen operations and implement solar generation

Determining which alternative is best for the City requires an understanding of how the co-gen plants operate and provide electricity and heating/cooling to the various buildings they serve. Co-generation is the sequential production of two energy forms, usually steam and electricity, from a single fuel source. In our case, natural gas is used as fuel to run reciprocating engines that turn generators to create electricity. Waste heat (heat created by a running engine) that would normally escape into the air, is recovered from the engines and passed through an absorption chiller to provide cold water for air conditioning. Alternatively, in the winter, waste heat is used to heat water for space heating. Co-generation was originally selected as the most appropriate alternative energy solution for Palm Springs due to the City's tremendous cooling requirements in the summer. Therefore, a co-gen plant can be a very valuable asset, in that it provides not only electricity for the City's facilities, but through its internal mechanical process, provides thermal energy (heating and cooling).

At the Municipal Plant behind City Hall, the co-gen plant distributes power to City Hall, the Police Station, Fire Station No. 2, Airport and Riverside County administration buildings, and the City Yard. The co-gen plant also provides heating/cooling to all of the buildings (except the City Yard) through the use of its absorption chillers and cooling tower. An exhibit showing the existing City-owned utility infrastructure (electrical lines, and hot/cold water lines) connecting the various municipal facilities is included as Attachment 2.

CES' analysis of the Municipal Plant determined that maintaining operation of the co-gen plant is the most economical alternative to providing electricity and heating/cooling to the facilities it serves. The direct cost to generate power through co-generation is less expensive than purchasing electricity from SCE directly ($0.12 per kilowatt hour vs. $0.08 per kilowatt hour)[1]. During the 2009/2010 fiscal year, the total power load on the Municipal Plant was 10.9 Million kilowatt hours. Given that the direct cost to generate power through co-generation is 67% of the cost to purchase electricity from SCE, CES recommends that the City make certain upgrades to the Municipal Plant to take advantage of the lower direct generation cost, and to make the plant significantly more efficient than it is today.

At the Sunrise Plant at Sunrise Park, the co-gen plant distributes power and provides heating/cooling to all of the facilities at Sunrise Park except the Boys and Girls Club and the Senior Center.

However, CES' analysis of the Sunrise Plant determined that maintaining operation of the co-gen plant is not the most economic alternative at Sunrise Park. The overall electrical load on the Sunrise Plant is much lower than the load on the Municipal Plant, and since its construction, the Sunrise Plant has produced more power than necessary for the facilities it serves. The balance of electricity produced is sold as excess electricity to SCE at very low rates. Therefore, the analysis determined that retiring the Sunrise Plant and purchasing electricity from SCE directly is the most economic alternative for Sunrise Park. A 439 kilowatt solar system is proposed to be constructed at the Pavilion Parking lot at Sunrise Park which will supplement the electricity required to be purchased from SCE.

In addition to the recommendations related to the co-gen plants, CES has identified lighting, energy management system ("EMS") control technologies, and building optimization measures at many of the City's facilities. Installation of these cost effective energy efficient technologies is estimated to reduce electric consumption and demand by over 2.7 Million kilowatt hours. Retrofit will include over 14,000 lighting fixtures within various City buildings, at the airport, on the City's palm tree uplights, and downtown decorative street lights. An integrated web-based energy management system is

[1] The direct cost to generate power through co-generation was determined by calculating only the cost to purchase natural gas to generate power, and excludes other overhead and maintenance costs associated with the co-generation plant.

recommended that will allow buildings to integrate and optimize the use of lighting, and heating/air conditioning systems. Water saving measures are recommended that include a new web-based irrigation controls system and improved irrigation coverage for enhanced water performance and efficiency which is estimated to save over 100 Million gallons of water annually.

On April 19, 2011, the Sustainability Commission reviewed the list of ECMs to be included in the overall Citywide energy management project, and has recommended the City Council approve the project which implements the most ECMs possible to be funded through energy savings. The list of ECMs includes:

- Municipal Co-Generation Plant: replace two existing 650 kilowatt rich burn engines with one 1,135 kilowatt lean-burn engine, replace existing chillers, boilers and cooling towers with new efficient equipment
- Sunrise Co-Generation Plant: modify the co-generation operation and replace with a new gas and electric cooling and heating hot water plant
- 439 kilowatt solar system at the Pavilion Parking Lot to provide power to Sunrise Park facilities
- 103 kilowatt solar system at the Convention Center
- Install a new Energy Management System for City facilities connected to the Municipal and Sunrise Plants
- City-wide lighting retrofit and upgrade (approx. 14,000 interior and exterior fixtures)
- Install remote lighting control and monitoring program for Palm Canyon Drive palm tree and decorative lights
- Install a new automated utility metering and monitoring system at the Municipal Plant
- Utilize a CES Energy Resource Manager to manage and monitor the Municipal Plant operation, and monitor implementation of all energy conservation measures to ensure guaranteed energy savings are achieved

Solar System Installations

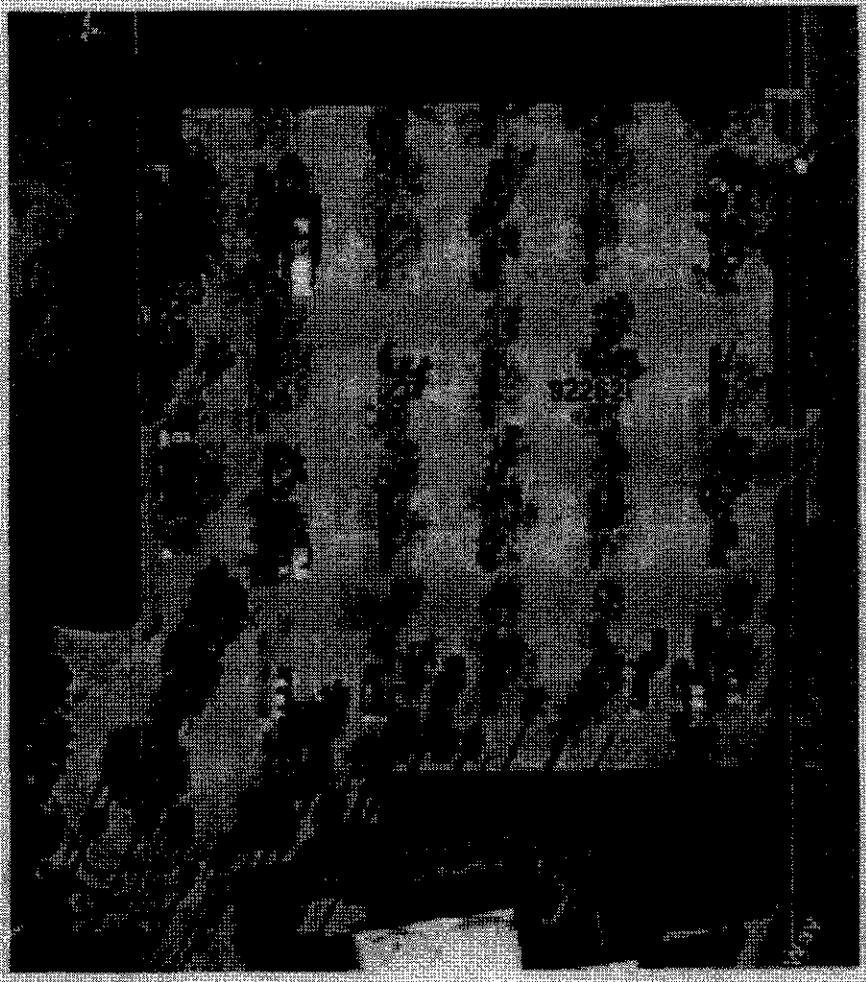
Included with the recommended list of measures are two solar system installations that, if installed separately, would not be covered entirely by energy savings. It is only with the use of energy savings resulting from measures implemented City-wide (i.e. Municipal co-gen upgrade, lighting retrofits and water savings measures) that these solar system installations may be paid from energy savings when bundled together as a single energy management project.

The proposed 439 kilowatt solar system to be installed at Sunrise Park would be constructed on new shade structures within the Pavilion Parking Lot. The shade structures with solar panels will provide covered parking and an opportunity to generate solar power. An example of the proposed solar system installation is shown on the next page:

A photo simulation of Sunrise Pavilion Parking Lot solar system with shade structures is shown here:

The location of the Pavilion Parking Lot is adjacent to Angel's Stadium, and includes mature landscaping and shade trees that would require removal to allow for construction of the shade structures to house the solar panels. The location of the Pavilion Parking Lot is shown on the next page.

Pavilion Parking Lot



Although there is a slight risk of balls from the adjacent field flying into the parking lot, staff consulted with Parks and Recreation staff and determined that the Pavilion Parking lot has a low risk of fly balls, with most landing in the Library Parking Lot. However, installation of a solar system in this area will carry some degree of risk, which would not be covered or guaranteed by CES. Removal and replacement of solar panels damaged by fly balls (or vandalism and theft of panels) would be the responsibility of the City.

Moving forward with the proposed 439 kilowatt solar system at the Sunrise Pavilion Parking Lot represents an approximate $2.7 Million cost to the overall energy management project. Taken separately, installation of this solar system does not pay for itself with energy savings over the 25-year life of the solar panels, as the capital cost to construct the shade structures and install the solar panels far exceeds the energy savings realized. What must also be understood is that the 439 kilowatt solar system will only supplement the average 550 kilowatt power demand from the various City

facilities connected to the Sunrise Plant. The City would continue to purchase electricity from SCE in addition to the power generated by the solar system. Eliminating this solar system from the overall energy management project would free up energy savings for our own use that would otherwise be used to offset the capital cost of the system. However, the Sustainability Commission recommended the City Council approve an energy management project paid from savings that encompasses as much solar (and other renewable energy sources) as possible regardless of the payback or economic cost of the measure itself.

The proposed 103 kilowatt solar system to be installed at the Convention Center would be constructed on the roof of the building, and although unseen by the public a real-time electronic display would be installed at a location inside the Convention Center to showcase generation of solar power at the facility. The size of the system is being recommended as it is the smallest system that qualifies for SCE renewable energy rate reduction, R-Rate (to qualify, at least 15% of the current overall energy demand at the Convention Center must be provided by the solar system). A larger solar system is not being recommended as the capital cost of the solar system is significant.

Moving forward with the proposed 103 kilowatt solar system at the Convention Center represents an approximate $600,000 cost to the overall energy management project. Taken separately, installation of this solar system does not pay for itself with energy savings over the 25-year life of the solar panels, as the capital cost of the system far exceeds the energy savings realized. What must also be understood is that the 103 kilowatt solar system will only supplement the average 560 kilowatt power demand from the Convention Center. The City would continue to purchase electricity from SCE in addition to the power generated by the solar system. Eliminating this solar system from the overall energy management project would free up energy savings for our own use that would otherwise be used to offset the capital cost of the system. However, the Sustainability Commission recommended the City Council approve an energy management project paid from savings that encompasses as much solar (and other renewable energy sources) as possible regardless of the payback or economic cost of the measure itself.

Project Benefits

The benefits of implementing all of the recommended energy conservation measures as a single energy management project include:

- Energy Reduction = 2.7 Million kilowatt hours = 15% reduction of total energy used
- Solar Generation = 817,000 kilowatt hours
- Natural Gas Reduction = 250,000 Therms = 21% reduction of total natural gas used
- Water Savings = 100 Million Gallons = 17% reduction of total water used
- Carbon Footprint Reduction = 611 cars or 3,116 Tons CO_2, or power for 378 homes

- The City is enable to invest and construct significant capital improvements which are paid from resulting energy and Operation & Maintenance savings estimated at $1.2 Million annually;
- New Municipal Co-Generation Plant is fully SCAQMD compliant, meeting all new stringent air quality permitting requirements;
- Remaining debt service on existing co-generation engines (approximately $270,000) is paid off;
- Project will be implemented by CES with a focus on local job creation and local economic stimulus which is estimated at an additional 192 indirect and induced jobs and more than $4 Million in additional economic impact (based on the National Renewable Energy Laboratory studies) – the local business preference program will be followed by CES to the greatest degree possible
- Project directly accomplishes 5 of the City's Sustainability Goals
- Project is an affirmation to the residents of Palm Springs of the City's focus on fiscal and environmental stewardship
- Project diversifies the City's energy generation mix and improves the City's air quality
- Project allows the City to take advantage of over $1 Million in utility incentives and renewable energy credits

FISCAL IMPACT:

Implementation of all of the Energy Conservation Measures recommended for approval (including the two solar systems) is estimated at approximately $20 Million (after crediting the City with incentives and rebates). Using the approximate estimate of $20 Million (assuming financing at 5.25% for 20 years) requires an annual debt payment of approximately $1.2 Million. According to CES' analysis, after implementation of all of the Energy Conservation Measures, $1.2 Million in energy and O&M savings will be realized which offsets the annual debt service required to pay for construction.

This was the underlying factor of this project – that it would be a "paid from savings" project requiring no upfront capital investment.

As the City would incur additional debt to pay for this project (paid from energy and O&M savings), the City will be required to maintain existing budget levels for utility costs. According to CES' analysis, after the project is implemented the reduced energy and water costs will result in a surplus of funds from which the debt service is paid. The key issue here is that, although savings are realized, those savings pay for the project. Therefore, moving forward on an annual basis the City will need to maintain its current budget levels for energy and water costs to ensure the savings are available to pay the debt service. As a condition of a performance based contract with CES, CES will guarantee these savings.

In the current 2010/2011 fiscal year budget, the City budgeted $6,439,908 for utility costs and another $2,478,723 for facilities maintenance (including co-gen plant maintenance) for a total budget of nearly $9 Million. Implementing this project is projected to reduce the City's energy and O&M costs by $1.2 Million or nearly 15% of this total, allowing for the City to appropriately finance construction of this project from those savings.

Following Council's approval of the list of Energy Conservation Measures to be included in the scope of the overall Citywide energy management project, staff will work with CES to finalize the guaranteed fixed price to design-build all of the improvements. CES' proposal will subsequently be reviewed by a third party to confirm that all of the proposed costs are reasonable with industry standards, that the resulting energy and O&M savings are appropriate, and that the proforma proposed by CES establishing the financial terms to the City for financing construction and implementation of the project is supported.

Following the third-party review supporting the financial terms of the CES' proforma, staff will schedule Council approval of the performance based guaranteed fixed price contract with CES (estimated by September 2011).

This project will be financed directly between the City and a financial institution of the City's choosing; CES, or its parent corporation Chevron, Inc., will not finance this project. CES recovers its costs for the engineering phase through the construction contract, and as the General Contractor, will include an appropriate overhead margin on administration of it. The terms and conditions of CES' design-build contract will be detailed in a future staff report to Council at the time the performance contract is scheduled for approval.

The action taken at this time does not commit the City to constructing any of the measures recommended for approval; it merely confirms for CES the scope of the energy management project from which they can seek bids and finalize their design-build contract for City approval. However, in the event the Council determines not to proceed with the energy management project, pursuant to the terms of the current agreement between the City and CES approved by Council on July 21, 2010, the City is obligated to pay CES a project development fee of $250,000 as payment for its costs to perform the energy audits and complete the preliminary engineering with which the recommended Energy Conservation Measures have been identified.

The only financial commitment recommended for approval by the Council at this time is to authorize application to the state for solar incentives (assuming installation of solar systems at Sunrise Park and the Convention Center remain in the scope of the project). Application for these incentives is time-sensitive as the program is administered as a "first-come – first served" basis, and the state can end the program without notice. The application fee for the proposed solar systems is approximately $15,000 which would be

paid from the Sustainability Fund, account 138-1270-50000 (unscheduled capital projects).

SUBMITTED:

Prepared by:

Marcus L. Fuller
Assistant Director of Public Works

Recommended by:

David J. Barakian
Director of Public Works/City Engineer

Approved by:

Thomas J. Wilson, Asst. City Manager

David H. Ready, City Manager

Attachments:

1. List of City Facilities Included in Energy Audit
2. Municipal Co-Gen Plant Utility System Map

ATTACHMENT 1

LIST OF CITY FACILITIES TO BE INCLUDED IN ENERGY AUDIT

Site	Building	address	Year	Size
city hall	admin. Offices/council chambers/annex restroom	3200 Tahquitz canyon way	1956	17,847
city hall	eoc admin offices	3200 Tahquitz canyon way	1965	14,116
City hall	canopies/covered walkways	3200 Tahquitz canyon way	1965	3,647
police station	admin. Offices/dispatch center/housing cells	200 s. civic drive	1985	44,946
library center	library	300 s sunrise way	1975	33,920
plaza theater	theater	128 s. palm canyon	1938	15,100
city hall annex	admin offices	3200 Tahquitz canyon way	1983	12,573
city hall annex	canopies/covered walkways	3200 Tahquitz canyon way	1983	3,666
police station training site	training center classrooms	200 S. civic Drive	1977	4,200
police station training site	indoor firing range/firing range addition	200 s. civic drive	1977	3,453
police station training site	Library office/conference room	200 s. civic drive	1977	1,081
police station training site	carport canopy	200 s. civic drive	1977	940
airport fire station #2	admin. Offices/fire station #2	300 N. El Cielo road	1975	18,109
airport fire station #2	hose drying canopy	300 N. El Cielo road	1977	1,200
airport fire station #2	boiler room	300 N. El Cielo road	1975	300
fire station #1	fire station #1	277 n. indian canyon drive	1957	5,364
fire station #3	fire station #3	590 e. raquel club road	1964	5,807
fire station #4	fire station #4	1300 la verne way	1971	4,608
fire station #5	fire station #5	5800 bolero road	1981	3,764
city yard	shop repair bldg	425 s. civic drive	1961	22,671
city yard	admin offices/shops	425 s. civic drive	1985	19,627
city yard	welding shop	425 s. civic drive	1965	700
city yard	gas pump canopy/cover	425 s. civic drive	1985	850
taxi holding building	office/break room	310 s. el cielo	2000	1,990
downtown parking structure	parking garage	275 s. indian canyon	2002	124,251
train station	restroom/storage	63950 palm springs station roa	1998	1,483
co-generator, muni	generation station	201 north el cielo road	1984	1,914
co-generator, sunrise	generator building	402 south cerritos drive	1984	1,702
wastewater treat plant	administration building (10.9 mgd plant)	4375 mequite avenue	1960	2,412
wastewater treat plant	maintenance / shop building	4375 mequite avenue	1960	3,655
palm springs international airport	airport terminal - zones a, b, c, & d	3400 east tahquitz canyon	1966	104,846
palm springs international airport	sonny bono concourse - zones g & f (gates 4-11)	3400 east tahquitz canyon	1999	78,722
palm springs international airport	east "t" hanger	3400 east tahquitz canyon	1968	10,114
palm springs international airport	west "t" hanger	3400 east tahquitz canyon	1968	10,114
palm springs international airport	temporary holdroom #1 (gate #3)	3400 east tahquitz canyon	1999	3,471
palm springs international airport	temporary holdroom #2 (gate #2)	3400 east tahquitz canyon	1999	3,471

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palm springs international airport	terminal walkways #1 (concourse area)	3400 east tahquitz canyon	1999	10,649
palm springs international airport	vehicle inspection plaza	3400 east tahquitz canyon	2003	2,000
palm springs international airport	vehicle inspection plaza shelter	3400 east tahquitz canyon	1999	9,000
palm springs international airport	covered walkway	3400 east tahquitz canyon	1968	7,348
palm springs international airport	restroom building - (old commuter holdroom)	3400 east tahquitz canyon	1968	480
palm springs international airport	portable office building #1 (north)	3400 east tahquitz canyon	1990	480
palm springs international airport	portable office building #2 (south)	3400 east tahquitz canyon	1990	480
palm springs international airport	portable office building #3 (vsa office)	3400 east tahquitz canyon	2003	960
palm springs international airport	covered baggage and maint shelter	3400 east tahquitz canyon	2003	2,176
welwood murray library	library	100 south palm canyon drive	1941	5,058
tahquitz creek golf course	golf clubhouse/golf cart storage building	1885 golf club drive	1962	12,990
tahquitz creek golf course	golf maintenance building	1885 golf club drive	1958	3,334
tahquitz creek golf course	restroom building #1 - legends course	1885 golf club drive	1994	279
tahquitz creek golf course	restroom building #2 - west side (modular)	1885 golf club drive	1994	52
tahquitz creek golf course	concession/restroom building - legends course	1885 golf club drive	1994	1,068
tahquitz creek golf course	pumphouse #1	1885 golf club drive	1994	620
tahquitz creek golf course	pumphouse #2	1885 golf club drive	1994	609
tahquitz creek golf course	restroom building #4 - east side	1885 golf club drive	1960	304
tahquitz creek golf course	small equipment shelter #1 (maint yard)	1885 golf club drive	1994	1,670
tahquitz creek golf course	large equipment shelter #2 (maint yard)	1885 golf club drive	1994	2,900
tahquitz creek golf course	portable office (supt of golf course)	1885 golf club drive	1980	720
tahquitz creek golf course	equipment shelter #3 (near wwtp)	1885 golf club drive	1994	1,670
stadium park	stadium	1901 east baristo road	1949	15,000
stadium park	concession stand building #1 (third base)	1901 east baristo road	1984	713
stadium park	concession stand building #2 (first base)	1901 east baristo road	1985	713
Stadium Practice Field	angel	2099 East Baristo Road	1949	480
Skate Park and Swim Center	Leisure Center	401 South Pavilion Way	1975	15,155
Skate Park and Swim Center	Pavilion	401 South Pavilion Way	1975	20,200
Skate Park and Swim Center	Swimming Center	401 South Pavilion Way	1979	358
Skate Park and Swim Center	Pool Filter Building	401 South Pavilion Way	1979	1,200
Skate Park and Swim Center	Skate Park	401 South Pavilion Way	2003	30,000
Skate Park and Swim Center	Swimming Pool	401 South Pavilion Way	1979	7,680
James O. Jessie Dessert Highland Unity Cente	Gymnasium	480 Tramview Road	1975	9,546
James O. Jessie Dessert Highland Unity Cente	Clubhouse	480 Tramview Road	1975	2,357
Denmuth Park	Restrooms/ Storage/ Concession Building	Mesquite Avenue	1973	1,767
Denmuth Park	Small Restroom Building @ Playground	Mesquite Avenue	1973	222
Denmuth Park	Original Restroom/ Storage Building w/ Canopy	Mesquite Avenue	1973	1,337
Denmuth Park	Restroom Building @ Field #7	Mesquite Avenue	1990	1,080
Denmuth Park	Blue Restroom Building	Mesquite Avenue	2003	368
Ruth Hardy Park	Restroom Building	700 Tamarisk Road	1965	684

Victoria Park	Restroom Building	2650 Via Miraleste	1965	684
McManus Village	Cornelia House- Historical	211-233 South Palm Canyon I	1952	940
McManus Village	Museum / Gallery- Historical	211-233 South Palm Canyon I	1952	3,310
McManus Village	Museum / Candy Shop- Historical	211-233 South Palm Canyon I	1957	2,685
McManus Village	Ruddy's General Store	211-233 South Palm Canyon I	1987	916
Everybody's Village	Theatre Building	538 North Palm Canyon Dr.	1974	9,820
Everybody's Village	North Wing- Meeting Rooms	538 North Palm Canyon Dr.	1974	2,079
Everybody's Village	South Wing- Meeting Rooms	538 North Palm Canyon Dr.	1974	1,300
Arts Springs Center	Gallery/ South Meeting Room	550 North Palm Canyon Drive	1974	3,023
Arts Springs Center	North Meeting Room	550 North Palm Canyon Drive	1974	2,050
Jaycee Frey Center (Homeless Shelter)	Homeless Shelter	1911 Baristo Road	1964	3,617
Palm Springs Youth Boxing Club	Boxing Club	225 El Cielo Road	1963	2,095
Convention Center (with 2003 & 2005 Addition	Convention Center	277 North Avenue Caballeros	1987	264,479
Mizell Senior Center	Senior Center	400 South Sunrise Way	1991	14,262
YMCA	YMCA	3601 E Mesquite Ave.		21,431

Downtown Decorative Street Lighting

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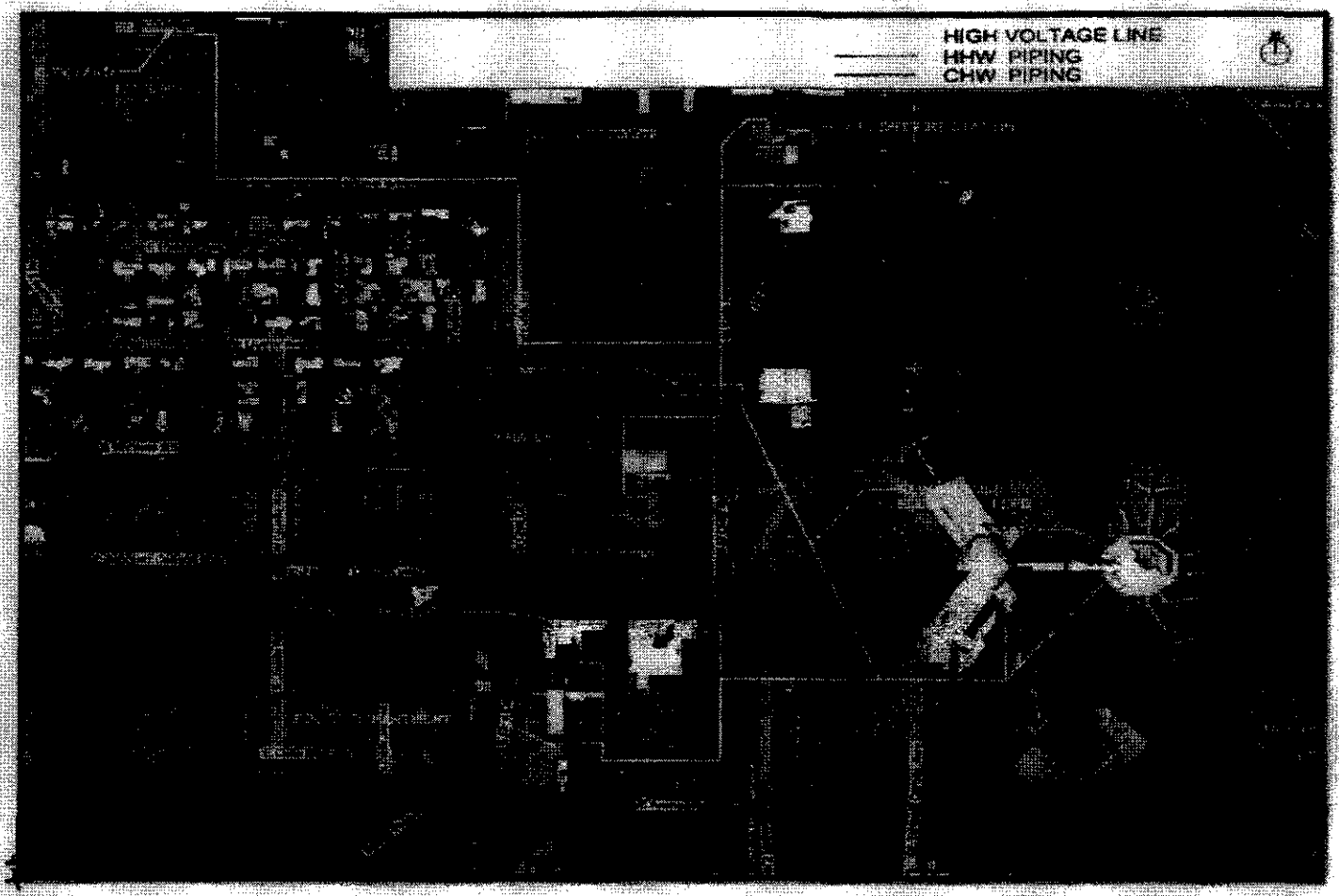
ATTACHMENT 2
MUNICIPAL CO-GEN PLANT UTILITY SYSTEM MAP



Program Options

• Municipal CO-Generation Plant (1135 kW)	Yes	Yes	Yes
• Sunrise Electric Plant	Yes	Yes	No
• 439 kW Solar at Pavilion Parking Lot	Yes	No	No
• 103 kW at Convention Center	Yes	Yes	Yes
• EMS Upgrade for Municipal & Sunrise Plants	Yes	Yes	Yes
• City-Wide Lighting Upgrade	Yes	Yes	Yes
• Palm Canyon Drive Lighting Control & Remote Monitoring	Yes	Yes	No
• City-Wide Irrigation Control and Remote Monitoring	Yes	Yes	Yes
• Automated Utility Metering / Monitoring	Yes	Yes	No
• CES Energy Resource Manager	Yes	Yes	Yes
• Variable Air Volume Upgrade (City Hall, PD, FS#2)	No	Yes	No
Paid Through Savings Annual Cash Flow	YES Neutral	YES $10K - $50K	YES $50K - $125K

ATTACHMENT 3

City Council Staff Report

Date: July 20, 2011 CONSENT CALENDAR

Subject: CITYWIDE ENERGY MANAGEMENT PROJECT

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

Pursuant to its agreement with the City, Chevron Energy Solutions ("CES"), a subsidiary of Chevron USA, Inc., has completed a Comprehensive Energy Analysis ("CEA") of all City facilities. The CEA identified certain energy conservation measures ("ECM"s) and it identifies a proposed scope for an energy efficiency and renewable energy project for the City. The CEA will be referred to by staff and the Council in ultimately determining the final scope of the energy management project undertaken by the City.

RECOMMENDATION:

1) Receive and file the Comprehensive Energy Analysis dated June 30, 2011, prepared by Chevron Energy Solutions Co.; and

2) Schedule a Study Session for September 28, 2011, for a separate discussion with staff and CES to review the list of ECMs proposed as part of the citywide energy management project, and to determine the final scope of the energy management project undertaken by the City.

STAFF ANALYSIS:

On May 18, 2011, the City Council was given a presentation by staff on the Citywide energy management project, including the results of CES' energy audit of all City facilities. At that time, Council deferred giving staff direction on the final scope of the Citywide energy management project, and requested that staff return to Council at a future Study Session to continue a detailed discussion of the project.

Subsequently, pursuant to the terms of the agreement between the City and CES, CES has completed its detailed Comprehensive Energy Audit ("CEA") of all of the City facilities it analyzed, and submitted it to City staff on June 30, 2011, for review and

approval. The terms of the City's agreement with CES require the City to review and agree on a recommended package of Energy Conservation Measures ("ECM"s) within 90 calendar days after submission of the final CEA report to the City. In the event the City does not move forward with the energy management project, the City is required to pay CES a $250,000 fee for preparation of the CEA, otherwise the fee is rolled into and is paid as part of the energy management project. A copy of Exhibit "B" to the City's agreement with CES is included as Attachment 1.

It continues to be staff's recommendation that the City move forward with a bundled project of ECM's that enable the City to leverage energy savings for needed capital investments to the Municipal Co-Gen plant, the Sunrise Co-Gen plant, lighting retrofits Citywide, and other identified measures. The complete list of ECM's previously reviewed and recommended for approval by the Sustainability Commission were presented to Council on May 18, 2011.

The list of ECM's included:

- Municipal Co-Generation Plant: replace two existing 650 kilowatt rich burn engines with one 1,135 kilowatt lean-burn engine, replace existing chillers, boilers and cooling towers with new efficient equipment
- Sunrise Co-Generation Plant: modify the co-generation operation and replace with a new gas and electric cooling and heating hot water plant
- 439 kilowatt solar system at the Pavilion Parking Lot to provide power to Sunrise Park facilities
- 103 kilowatt solar system at the Convention Center
- Install a new Energy Management System for City facilities connected to the Municipal and Sunrise Plants
- City-wide lighting retrofit and upgrade (approx. 14,000 interior and exterior fixtures)
- Install remote lighting control and monitoring program for Palm Canyon Drive palm tree and decorative lights
- Install a new automated utility metering and monitoring system at the Municipal Plant

Given the discussion on the economics of solar photovoltaic systems with Council on May 18, staff will be recommending against including the 439 kilowatt solar system at the Pavilion Parking Lot, which will reduce the overall cost of the energy management project by approximately $2.7 Million. Whether or not to include the 103 kilowatt system proposed at the Convention Center can be further discussed with Council at a future Study Session.

Due to the provisions in the City's agreement with CES, it is important that the City Council schedule a Study Session for September 28, 2011, to ensure that the City provides CES with direction on the scope of the energy management project prior to the 90 day deadline established by the agreement.

FISCAL IMPACT:

In the event the Council determines not to proceed with the energy management project, pursuant to the terms of the current agreement between the City and CES approved by Council on July 21, 2010, the City is obligated to pay CES a project development fee of $250,000 as payment for its costs to perform the energy audits and complete the Comprehensive Energy Audit in which the recommended ECM's have been identified.

SUBMITTED:

Prepared by:

Marcus L. Fuller
Assistant Director of Public Works

Recommended by:

David J. Barakian
Director of Public Works/City Engineer

Approved by:

Thomas J. Wilson, Asst. City Manager for David H. Ready, City Manager

Attachments:
1. Exhibit "B" to Agreement with CES

NOTE: Comprehensive Energy Audit (on file in the Office of the City Clerk)

EXHIBIT "B"

Fee Estimate

Except as provided for below, within 90 calendar days of the City's review and approval of final Comprehensive Energy Analysis (CEA) report as submitted by the Consultant, City shall compensate Consultant for performance of the Energy Audit by payment to Consultant of Two Hundred Fifty Thousand Dollars ($250,000). This fee is for performance of the Scope of Work set forth in Exhibit A.

As set forth in Exhibit A (I)(J-L), the City shall have input and discretion in determining the conclusions, recommendations and ECMs to be incorporated in the final CEA report. As indicated in the Scope of Work set forth in Exhibit A, the City shall be entitled to review the retrofit options proposed in the Energy Audit, and to agree on the Consultant's recommended package of ECMs consistent with the City's investment and infrastructure improvement goals.

A. City shall have no payment obligations at the time of execution of this Agreement, but acknowledges that the fee indicated above shall be incorporated into the total contract amount in the event City and Consultant execute an Energy Services Agreement within ninety (90) calendar days after submission of the final CEA report by Consultant to the City. However, if the parties do not execute an Energy Services Agreement within ninety (90) calendar days after the City review and approval of Consultant's final CEA report to City, then the audit fee set forth above shall be immediately due and payable by City to Consultant. City and Consultant agree to enter into good faith negotiations of an Energy Services Agreement immediately following completion of the Energy Audit.

B. City and/or Consultant reserve the right to terminate the Agreement at any time during the comprehensive audit. If canceled by City, costs incurred by Consultant at the date of termination would be pro-rated based on percentage of completion, and payable by City.

C. Should the Consultant determine any time during the Energy Audit that the projected savings to City will not support a paid-from-savings project, Consultant shall immediately notify City, and the audit shall be terminated by Consultant. In this event, this Agreement shall terminate and the City shall have no obligation to pay any amount to the Consultant. For purposes of this Agreement, a "paid-from-savings project" shall mean an energy service contract as identified in Section 4217.12 of the California Government Code.

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