



## CITY COUNCIL STAFF REPORT

DATE: June 4, 2014

NEW BUSINESS

SUBJECT: SOLAR FEASIBILITY – PRESENTATION AND DISCUSSION

FROM: David H. Ready, City Manager

BY: Special Projects Coordinator

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### SUMMARY

The City Council will receive a presentation from Newcomb/Andersen/McCormick regarding solar alternatives for City facilities for consideration by the City Council.

### RECOMMENDATION:

Direct staff as appropriate.

### STAFF ANALYSIS:

The City hired Newcomb/Andersen/McCormick (NAM) to take a second look at the feasibility of installing Photo Voltaic (PV) Solar on many of the City facilities. More specifically NAM was to review the option of taking advantage of a seldom utilized SCE program (RES-BCT) that would allow the City to build a large PV array and have the power distributed to other facilities via bill credit and debit. (Copy of the report on file in the office of the City Clerk)

The California solar regulatory environment is constantly in a state of flux and as such the report goes into great detail on the current environment and programs that exist that the City could avail itself of. The one program that was of specific interest to the City was the RES-BCT self-generation bill-credit transfer program. This tariff program on the surface looks quite promising until one realizes that the credit transfer portion of the tariff only allows for offset of the "generation component charges" it does not allow for demand charges to be offset, thus the financial benefit is greatly reduced and in the instance of the City's facilities it does not pencil out. Any project that the City were to undertake will qualify for the California Solar Initiative Incentive Program, which is more thoroughly described in the study document. The most promising current SCE tariff

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program is the Net Energy Metering (NEM) program which gives credit to customers for excess energy that is produced.

The study document details how NAM goes about conducting a feasibility study, including all the parameters and assumptions that they utilize; all being very conservative. NAM reviewed numerous City sites for possible solar installations and narrowed down the possibilities to eleven (11) specific sites. Each site was modeled and evaluated based on three approaches to financing for the projects: 1) Cash Purchase, 2) Power Purchase Agreement (PPA) (Third Party Financing), or 3) Simple Loan (Bond Financing).

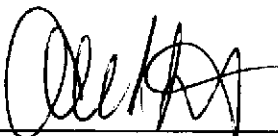
The study recommends that the City consider bidding all eleven sites under both a financing and PPA approach in an attempt to drive down the overall price with competition. Staff believes that the study provides an excellent base for a decision making process to follow and the data provided will be invaluable in developing and evaluating any future RFP process that might occur.

The decision making process must include discussions of such items as roof mounted vs carport mounted systems; what a carport might look like; what about the need to remove trees; as well as discussions on the use of currently owned City acreage for a ground mounted system. Once these policy type decisions are made the list of sites can be narrowed and an RFP process can be developed.

The study clearly indicates that a ground mounted system at the Animal Shelter would be a good investment as would the possibility of a ground mounted system for the Wastewater Treatment Plant if acreage could be utilized for this purpose. The Convention Center parking lot with carports is also a good possibility, however, the location of the permanent parking for the Convention Center is in a state of flux currently. The other sites, as stand-alone sites, are not as viable.

FISCAL IMPACT:

The NAM report reveals that the best results are achieved if the City were able to purchase the systems with cash. The analysis reveals that the 25 year net benefit of the financing and the PPA approaches are essentially the same.



Allen Smoot, Special Projects Coordinator



David H. Ready, City Manager



# City of Palm Springs

## Solar Feasibility Analysis Results

# Agenda

- Background
- Analysis Methodology & Assumptions
- Results
- Next Steps



# Background

- Investigation of solar across 11 sites
  - ❖ Downtown Parking Structure
  - ❖ Fire Station #1
  - ❖ Jaycee Frey
  - ❖ Demuth Community Center
  - ❖ Sunrise Plaza
  - ❖ Animal Shelter
  - ❖ Demuth Park
  - ❖ Fire Station #2
  - ❖ Tahquitz Creek Golf Course
  - ❖ Convention Center
  - ❖ Wastewater Treatment Plant
- Procurement Strategies: PPA vs. Direct Purchase
- Interconnection Strategies: NEM, NEMA, or RES-BCT

## Analysis Methodology

- Review of energy use across City facilities
- Use of aerial imagery to determine best locations for solar arrays
- Review of current and developing legal, regulatory, and program rules
- Development of three scenarios for analysis
- Estimation of energy project costs and savings over the project lifecycle
- Project Management and contingency incorporated into costs

# Critical Financial Analysis Assumptions

- *The price of energy purchased from SCE and annual escalation rate:*  
The analysis considers an annual escalation rate of 4.5%.
- *The amount of energy consumed and the profile of that consumption:*  
The models assume the load pattern observed so far is a good indication of future load patterns.
- *The cost of the solar system:*  
Considering recent procurement experience at other public institutions, we use conservative estimate for system cost assumptions:
  - \$4.00 per Watt dc, which includes O&M, inverter replacement, and performance guarantees
  - \$0.125 per kilo-Watt hour, for Power Purchase Agreements
  - \$3.25 per Watt dc, for centralized installations

## Results

- Of the 11 sites investigated:
  - Solar at two sites were estimated to create bill savings of over \$7 million over a 25 year timeline for each site (Convention Center & Waste Water Plant)
  - Solar at two sites were estimated to create bill savings of over \$2 million over a 25 year timeline for each site (Animal Shelter & Sunrise Plaza)
  - Solar at four of the sites produce marginal benefits with conservative cost estimates
- Net Benefit for entire portfolio is over \$2 million over a 25 year timeline
  - Net Benefit includes all costs: Construction, Performance Guarantee, Operation & Maintenance, Project Management, Simple Financing, etc.



## Recommendation

- Distributed NEM provides the highest value to the City
  - Both PPA and Purchase scenarios are viable
- RES-BCT scenario less viable
- Determine City's aesthetic requirement
  - Carports in parking lots
  - Visible roof systems
- Move forward with competitive bids
  - Capture both PPA and Purchase pricing
  - Ensure Performance Guarantee, Warranties, and Operation & Maintenance of system are in place

## Next Steps

- Develop and issue an RFP to the vendor community
  - Provide site details
  - Outline contractual obligations
  - Produce refined system layouts
  - Finalize system costs
  - Identify the best value solar vendor
- Secure project financing if proceeding with direct purchase scenario
- Contract Negotiations
- Construction Period Services

# Questions?

Parking Lot  
Tracking Solar  
System



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**NAM**  
Newcomb|Anderson|McCormick

# Photos

Playground Fix  
Tilt Solar System



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# Photos

Field Fix Tilt  
Solar System



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# Photos

Parking Garage  
Fix Tilt Solar  
System



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# Photos

Parking Garage  
Fix Tilt Solar  
System



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# Photos

Parking Lot Non-traditional Fix Tilt Solar System



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# Photos

Parking Lot Non-traditional Fix Tilt Solar System



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## Reference: Likely Benefits

Site	System Type	25 Yr Utility Bill Savings	Total Costs	CSI Incentive	25 Yr Net Benefit
Downtown Parking Structure	Shade Structure	\$616,388	(\$528,484)	\$56,000	\$143,903
Demuth Park	Shade Structure	\$265,197	(\$276,126)	\$24,889	\$13,960
Fire Station 1*	Shade Structure	\$306,465	(\$404,327)	\$36,444	(\$61,418)
Fire Station 4	Ground Mount and/or Roof Mount	\$298,155	(\$296,266)	\$35,555	\$37,445
Jaycee Frey	Roof Mount	\$68,808	(\$68,008)	\$5,333	\$6,134
Tahquitz Creek Golf Course*	Shade Structure and/or Roof Mount	\$516,748	(\$631,145)	\$56,889	(\$57,508)
Demuth Community Center*	Roof Mount and/or Shade Structure	\$334,692	(\$394,266)	\$41,778	(\$17,796)
Animal Shelter	Ground Mount	\$2,317,801	(\$2,109,271)	\$271,110	\$479,639
Convention Center - Roof	Roof Mount	\$3,668,511	(\$3,790,868)	\$426,665	\$304,307
Convention Center - Carport	Shade Structure	\$3,976,734	(\$4,320,150)	\$457,776	\$114,359
Sunrise Plaza	Roof and/or Shade Structure	\$2,653,287	(\$2,724,686)	\$306,665	\$235,266
Wastewater Treatment Plant - Fixed	Ground Mount	\$8,274,607	(\$8,471,663)	\$1,157,231	\$960,175
	TOTAL	\$23,297,393	(\$24,015,260)	\$2,876,334	\$2,158,467
	<b>Selective TOTAL*</b>	<b>\$22,139,487</b>	<b>(\$22,585,522)</b>	<b>\$2,741,223</b>	<b>\$2,295,189</b>
*Marginal sites removed					

## Reference: System Information

Site	System Type	Potential System Size (kW DC)	Year One Estimated Energy Usage (kWh)	Year One Estimate Solar Generation (kWh)	Percent Offset
Downtown Parking Structure	Shade Structure	63	133,495	100,230	75%
Demuth Park	Shade Structure	28	59,795	44,547	74%
Fire Station 1	Shade Structure	41	86,475	65,229	75%
Fire Station 4	Ground Mount and/or Roof Mount	40	83,581	63,638	76%
Jaycee Frey	Roof Mount	6	12,603	9,546	76%
Tahquitz Creek Golf Course	Shade Structure and/or Roof Mount	64	134,898	101,821	75%
Demuth Community Center	Roof Mount and/or Shade Structure	47	112,452	74,775	66%
Animal Shelter	Ground Mount	305	646,102	485,239	75%
Convention Center (Roof)	Roof Mount	480	1,113,998	763,656	69%
Convention Center (Lot)	Shade Structure	515	1,091,374	819,339	75%
Sunrise Plaza	Roof and/or Shade Structure	345	2,773,670	2,071,242	75%
Wastewater Treatment Plant	Ground Mount	1225	2,773,670	2,068,234	75%

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## Reference: Scenario Comparison

Scenario	Total Life Cycle Cost	25 Year Net Benefit	25 Year NPV	Payback Period
NEM Purchase	(\$13,739,918)	\$12,433,809	\$4,705,714	14
NEM Simple Loan	(\$24,015,260)	\$2,158,467	\$1,358,369	Term
NEM PPA	(\$21,119,024)	\$2,178,369	\$947,544	16
RES-BCT Purchase	(\$13,882,239)	\$6,062,458	\$644,636	18
RES-BCT Simple Loan	(\$24,092,413)	(\$4,147,716)	(\$2,681,478)	Term
RES-BCT PPA	(\$23,843,507)	(\$7,441,354)	(\$5,496,615)	-

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