



**REVISED SPECIAL MEETING AGENDA
RENEWABLE ENERGY COUNCIL**
Monday, May 23, 2016 at 7:00 p.m.
Fire Emergency Operations Center
817 Mound Avenue, South Pasadena, CA 91030



Council Chair: William Kelly
Councilmembers: Andrew Eaton, William Glauz, Kim Hughes,
Alexander Kung, Charles Li, Carl Marziali, Daniel Snowden-Ifft and Daryl Trinh
City Council Liaisons: Mayor Pro Tem Michael Cacciotti, Councilmember Richard Schneider
Staff Liaison: Christopher Castruita, Management Analyst

PUBLIC COMMENTS AND SUGGESTIONS

Time reserved for those in attendance who wish to address the Council. All attendees should be aware that the Council may not discuss details or vote on non-agenda items. Your concerns may be referred to staff or placed on a future agenda. Note: public input will also be taken during all agenda items.

BUSINESS ITEMS

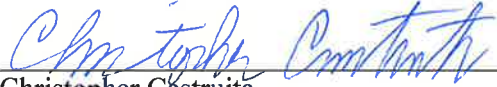
- 1) Roll Call (2 minutes)
- 2) Approval of March Meeting Minutes (5 minutes)
- 3) Technical subcommittee presentation and consideration of forwarding the city council the subcommittee's memo outlining its analysis of the potential for solar energy systems at city facilities. (45 minutes)
- 4) Discussion and action on any financial committee recommendations. (15 minutes)
- 5) Discussion and consideration of draft Renewable Energy Council report and recommendations to the City Council. (30 minutes)
- 6) Next meeting date and discussion of future role of the council. (15 minutes)
- 7) Other Business (5 minutes)
- 8) Council Communications (2 minutes)
- 9) Staff Liaison Communications (2 minutes)
- 10) Next Meeting Date (2 minutes)
- 11) Items for a Future Agenda (2 minutes)
- 12) Adjournment (1 minute)

AFFIDAVIT OF POSTING AGENDA

I, Christopher Castruita, Management Analyst of the City of South Pasadena, certify that a copy of the meeting agenda of May 23, 2016 was posted on or near the door of the meeting room, City Hall Bulletin Board, and on the City's website, www.southpasadenaca.gov at 7:00 PM on May 20, 2016.

I declare under the penalty of perjury that the foregoing is true and correct.

Date: May 20, 2016



Christopher Castruita
Management Analyst

**SPECIAL MEETING MINUTES
RENEWABLE ENERGY COUNCIL
March 28, 2016**

1. **Roll Call** - The meeting was called to order at 7:02 p.m. Present were Chair William Kelly and Council Members Andrew Eaton, William Glauz, Kim Hughes, Alexander Kung, Charles Li, Carl Marziali, and Daniel Snowden-Ifft. Absent was Council Member Daryl Trinh. Staff Liaison Christopher Castruita was present. City Council Member Richard Schneider attended.
2. **Minutes** – Minutes from February 29, 2016 meeting were approved (Snowden-Ifft, Glauz, 8-0).
3. **Review the Technical Subcommittee presentation on its latest analyses of the potential for solar for city facilities, including potential switching of rate schedules, discussion of site visits and informational estimates for Wilson Reservoir, discussion of site visits and informational estimates for City Hall, and discussion of the net metering tariff schedule and possible use of Southern California Edison’s RES-BCT tariff schedule instead.**– Council members Eaton, Glauz, and Snowden-Ifft presented an updated analysis, including information on the site visits and unofficial quotes received from solar developers for both the City Hall and Wilson Reservoir, the Energy Conservation Assistance Act loan program through State of California, and the differences between and potential of using the RES-BCT tariff schedule and the Community Solar program. They then took questions from the REC.

Chair Kelly moved that the Technical Subcommittee prepare a presentation to the City Council that reviews the preliminary analysis for installing solar facilities at City Hall and Wilson Reservoir, and the opportunity to move to a more favorable rate structure with the installation of solar facilities. Staff Liaison Castruita requested a clarification on the motion, asking if the presentation should take place during the next available Council meeting, as opposed to a specific Council meeting or by a particular date, given that the Council meeting schedule is very busy during budget season making it hard to add items. The motion was approved (Kelly, Hughes, 8-0).

4. **Develop Questions for the Renewable Energy Council Staff Liaison to discuss with Southern California Edison representative** – Staff liaison Castruita described his work thus far with Southern California Edison staff members, including obtaining information on the City’s electricity usage. He explained that it would be difficult to have technical representatives attend an upcoming meeting both due to the time of day the REC meets and because it is against company policy to have technical employees attend public meetings on behalf of the organization. He recommended that the Renewable Energy Council develop a set of questions which he could then pose to Southern California Edison representatives and forward the responses. Technical subcommittee to draft list of questions for Staff liaison Castruita to pose to Southern California Edison representatives prior to the next Renewable Energy Council meeting.

- 5. Discussion and possible action on early committee recommendations to the city related to renewable and clean energy projects, including seeking an updated energy audit, receiving brief bi-monthly status reports on Los Angeles County's efforts to develop a community choice aggregation program, and including a solar module in this year's Clean Air Car Show** – Chair Kelly presented a set of preliminary recommendations for the Renewable Energy Council to make to the City Council, which the Renewable Energy Council then discussed further. Technical subcommittee and Public Affairs subcommittee to work on a presentation or panel to be held at the Clean Air car show tentatively schedule to be held in the summer. The motion to include recommendations for the City Council to obtain an updated energy audit and receive bi-monthly status reports on Los Angeles County's efforts to develop a community choice aggregation program within the presentation to the City Council was approved (Hughes, Kung, 8-0).
- 6. Discussion of next steps for Finance and Public Affairs Subcommittees** – The Renewable Energy Council discussed how the Finance subcommittee could further the analysis of the technical subcommittee by comparing the option to fund the construction of solar facilities directly out of General Fund reserves versus obtaining a low-interest loan through the state's Energy Conservation Assistance Act loan program. In addition, the Public Affairs subcommittee to draft template letters to solar vendors seeking participation at the Clean Air Car Show exhibition booths.
- 7. Other Business** – The Renewable Energy Council discussed the timeline for completing their report to Council, and whether additional work would be required after they have submitted their report.
- 8. Chair and Council Communications** – n/a
- 9. Staff Liaison Communications** – Staff liaison Castruita thanked the Renewable Energy Council members who attended the Community Forum on budget and priorities. He also stated that he was happy to see the Renewable Energy Council focus their discussion on the specifics of their recommendation to the City Council.
- 10. Next Meeting Date** – Staff Liaison Castruita to send out an online poll in order to determine what date the meeting will be held. Due to Staff Liaison Castruita taking personal time, the next meeting will be scheduled on either a Monday or Thursday in mid-to-late May 2016.
- 11. Items for a Future Agenda** – Chair Kelly requested that Renewable Energy Councilmembers send a request to place an item on a future agenda to Staff Liaison Castruita, who could discuss with Chair Kelly and make a determination as to whether to place it on an upcoming agenda.
- 12. Adjournment** – The meeting adjourned at 8:57 p.m.

William Kelly, Chair

Date



**City of South Pasadena
Management Services Department**

Memo

Date: May 20, 2016
To: Renewable Energy Council
From: Christopher Castruita, Staff Liaison, Renewable Energy Council *CC*
Re: May 23, 2016 Renewable Energy Council Agenda Item No. 3
Materials

Attached for your review is a draft memo prepared by the Renewable Energy Council Technical Subcommittee (Andy Eaton, Bill Glauz, Daniel Snowden-Ifft). The memo is currently in draft form for inclusion in the report to the City Council. Please review the memo in advance of our meeting this Monday, May 23, in order to provide comment upon and potentially approve the memo for inclusion in the Renewable Energy Council's final report.

Further materials for the report are currently being developed by the Public Affairs Subcommittee, and will be available at an upcoming Renewable Energy Council meeting. In addition, draft materials for the report from the Finance subcommittee comparing various financing options for the construction and maintenance of renewable energy facilities are expected to be distributed at our May 23 meeting.

Should you have any initial questions on the draft memo, please feel free to contact me directly at (626) 403-7237 or ccastruita@southpasadenaca.gov.

Solar in South Pasadena: First Steps

EXECUTIVE SUMMARY

The South Pasadena Renewable Energy Council (REC) strongly recommends that City Council direct staff to develop and issue a request for proposals (RFP) for two solar projects on City properties at Wilson Reservoir and City Hall. These projects will produce enough renewable energy to reduce the City's overall electrical use by 10% and reduce the City's electric bill by at least \$70,000 annually. In addition, by taking advantage of available funding through the State of California's Energy Conservation Assistance Act (ECAA) these two projects can provide net positive cash flow to the City in year 1, even after the loan payments. That's because the state financing program offers 20-year loans for municipal renewable energy projects with a 1% interest rate. However, because funding through the ECAA program is limited and SCE caps the number of solar projects allowed under the tariff time is of the essence in moving forward. Members of REC are willing to help structure an RFP and evaluate proposals in order to help advance these projects.

Introduction

The Renewal Energy Council (REC) was established by the City Council in order to explore renewable energy options for City properties as a way of decreasing fossil fuel use and saving energy costs.

The REC is putting together a comprehensive long-term plan (Roadmap) for increasing renewable energy usage in the City overall, including concepts such as community solar, which will be presented in a separate document in the near future. But in the course of the committee's meetings it became clear that there were some near term opportunities to install solar at several locations in the City as a way to begin the journey.

With the assistance of City staff and SCE, the REC obtained extensive data for energy usage and payments for all 108 City electrical meters. Figure 1 below summarizes both energy and bill information in 11 sites/categories.

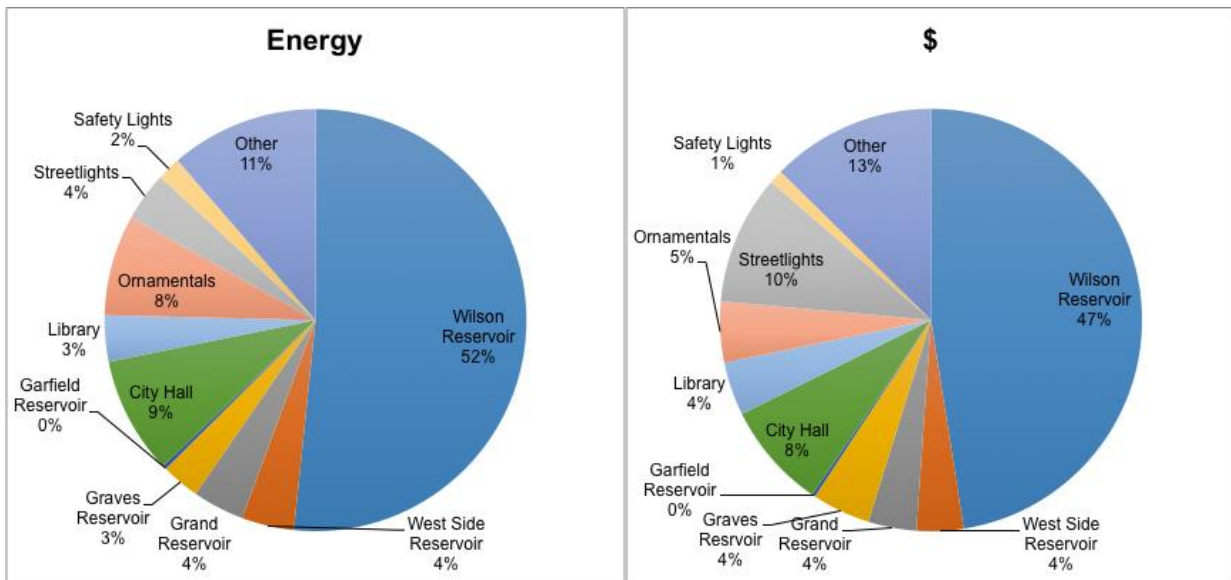


Figure 1: 2105 electrical energy and bill data for the City of South Pasadena. The left chart shows percentage energy usage while the right shows percentage billing information.

It is clear that the water department is the biggest user of electricity with a 63% share of usage and 59% share of bills, and most of that is associated with pumping water from the Wilson Reservoir. The reason for the high electrical usage at Wilson is that the City gets most of its water from groundwater that is pumped from the City's Wilson Reservoir, in San Gabriel, several miles uphill to the City's Water Distribution System. Thus, significantly offsetting energy usage and costs in South Pasadena means looking at offsetting energy usage and costs for water pumping, especially at the Wilson Reservoir Pumping site.

At 9% usage and 8% bills City Hall is the 2nd major user of electricity in the City (excluding lighting) and has the additional benefit of being highly visible. Because of the dispersed nature of the lighting it is not possible to provide a solar offset for this energy. See the Roadmap for future ideas to offset this usage.

We thus looked at both of these facilities as potential "low-hanging-fruit" to determine if it was cost effective to implement solar installations in South Pasadena. This proposal considers the near term installation of solar on Wilson Reservoir and the public parking spaces opposite City Hall.

Benefits of South Pasadena City Solar Installations

The City of South Pasadena consumes about 6,200,000 kWh of electricity annually. This is for City operations only and does not include electricity use for private homes and businesses. This electricity costs the City nearly \$1,000,000 annually.

The two solar installations being recommended by the REC, Wilson Reservoir and City Hall, at approximately 370 kW combined power output, will produce about 620,000 kWh annually, lowering the City's electricity needs by about 10%. This will reduce greenhouse gas emissions

by 260 metric tons per year, equivalent to eliminating 56 cars from the road [1]. This will also reduce the City's electric bill by at least \$70,000 in the first year of operation, as discussed below.

The development of these two solar projects and potentially additional solar projects in the future will be a visible and significant display of the City's commitment to supporting renewable energy development, reducing carbon emissions and promoting a sustainable environment for future generations, while at the same time paying for themselves, as discussed below.

Financing

The financing of any renewable energy project is a crucial consideration. The REC considered multiple options for financing solar in South Pasadena. A full discussion of these options will be presented in the Roadmap. For these two projects we suggest financing through the State of California's Energy Conservation Assistance Act (ECAA) [2] as the best, short-term, option for the City. This program provides 20 year, 1% loans, for cities, counties, colleges and universities and public care institutions/public hospitals to pay for renewable energy projects. Though the applicants are limited, the funds are as well and it is first come/first served basis for the loan applications. There is thus some time pressure to act on this.

The advantages of obtaining a long-term, low-interest loan are two-fold. First, loan payments are fixed whereas electricity prices are expected to increase between 2 and 4.4% in the coming decades [3]. Second, if the loan payments are low enough, a positive cash flow can be obtained in the first year and payback periods can be short.

Figure 2 shows the predicted financial picture for the combined projects. Details of these predictions can be found in Appendices A and B at the end of this memo. These details are important and were analyzed thoroughly by the REC. The financial model for these projects includes:

- 1) Averages of the installed price estimates and energy production from solar energy development companies who visited the sites;
- 2) ECAA financing conditions mentioned above. The impacts of this beneficial financing are shown in Figure 2 with a net positive cash flow in year 1 and a significantly more positive cash flow at year 20, when the loan is completely repaid;
- 3) Electric rate increases of 4.4% until 2022 followed by 2% thereafter based on current utility research [3];
- 4) Degradation of the solar panels over time, estimated at 0.5% per year [4];
- 5) Maintenance, especially inverter replacement based on estimates from the installers;
- 6) Optimization of SCE's electric rate structure, which has a capacity limitation that translates to a need to move forward quickly before the capacity limit is reached;
- 7) Future pumping operations at Wilson Reservoir when Garfield Reservoir comes online in 2017, that significantly affect predicted future savings. The REC deliberately chose the most conservative assumption for future operations;

8) Pricing both projects separately. This is also conservative, as doing both projects at the same time would yield additional savings.

For each year out to year 42, the REC estimated the net savings to the City. The net savings is equal to the savings on electric bills less loan payments and maintenance for the solar projects. Figure 2 shows the cumulative net savings for the City.

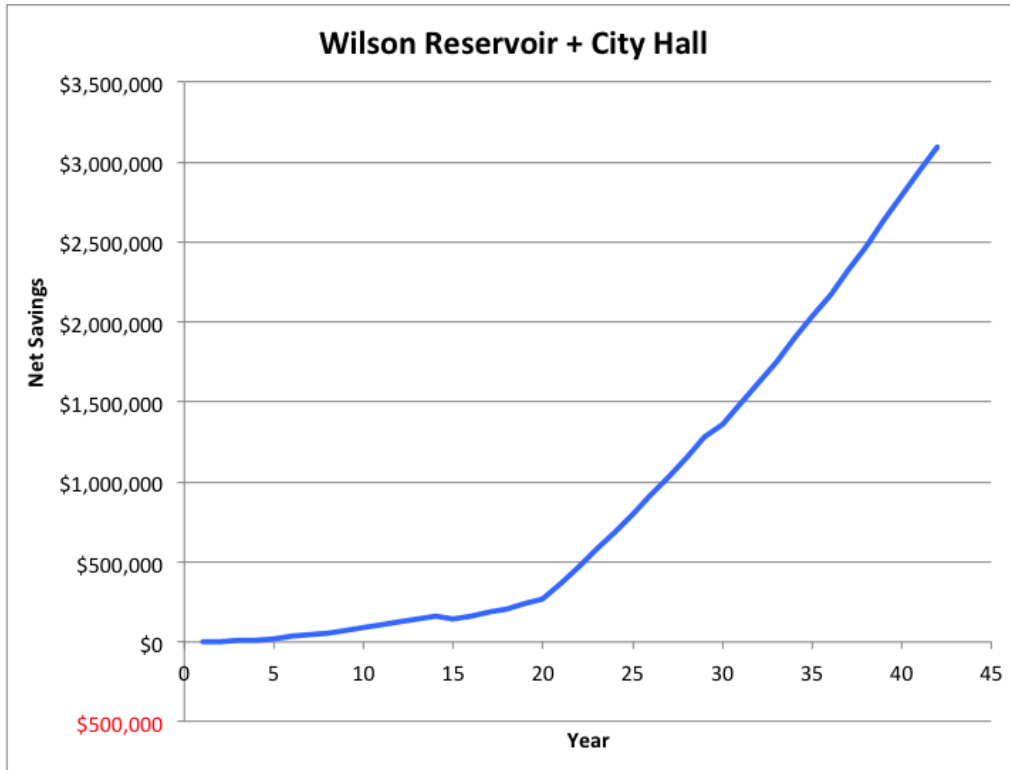


Figure 2: This plot shows the cumulative net monetary effect on the City of installing solar arrays on the Wilson Reservoir and City Hall under the ECAA financing scheme.

The loan payments are smaller than the savings starting after year 1. However ECAA doesn't require payment for the first year. *Remarkably this proposal predicts a net positive cash flow in the first year of operation and thereafter.* Furthermore, as detailed above and in the appendixes, we believe this estimate is conservative.

Conclusion

In the strongest possible terms the REC recommends moving forward quickly with these two projects. Combined they will provide the City of South Pasadena with a 10% clean energy offset. One of them would be highly visible demonstrating the City's commitment to a sustainable future. Moreover, the financial model we have developed suggests that the installations can be completed for minimal (staff time only but members of the REC are willing to help) costs. The larger effect of acting on this proposal, though, is to show the community and beyond, the benefit of the responsible deployment of renewable energy at the City scale.

References

- [1] <https://www.sce.com/wps/portal/home/about-us/environment/energy-conservation/!ut/p/b1/pV>

- [2] <http://www.energy.ca.gov/contracts/PON-13-401/>

- [3] The Future of Electricity Prices in California: Understanding Market Drivers and Forecasting Prices to 2040, Jonathan Cook, Ph.D.

- [4] From “Best Practices in PV System Operations and Maintenance”, NREL, Version 1.0, March 2015. Available at <http://www.nrel.gov/docs/fy15osti/63235.pdf>.

Appendix A – Proposed Wilson Reservoir Solar Project Details

The South Pasadena REC surveyed numerous City facilities to identify the best sites for solar development. The survey included looking at electricity use as well as space available to install solar panels. The City's water supply system consisting of large covered reservoirs and pumps is ideal for solar energy development. The City's largest electricity use is for water pumping and the largest single site for use of electricity is the City's Wilson Reservoir and groundwater pumping site in the nearby City of San Gabriel. This facility was recently rebuilt with a state of the art covered reservoir over 12,000 square feet in size. Most of this reservoir is also free of shading obstructions. The REC made some preliminary estimates to install solar that made it apparent that this site should be investigated further.



Figure 3: Wilson Reservoir Site in the City of San Gabriel



Figure 4: Site Visit to Wilson Reservoir. Note the new concrete roof structure.



Figure 5: Aerial View of Wilson Reservoir. Note there is some shading on the right.

Based on the preliminary estimates, the REC decided to pursue preliminary bids from several solar contractors. On March 9, 2016, three solar contractors toured the Wilson Reservoir site, along with the South Pasadena City hall complex and two of the contractors provided informal solar project proposals. These proposals estimated a solar project size of 140 kW DC that would produce over 220,000 kWh annually. The cost of this project would range from about \$350,000 to \$375,000, less than \$2.70/ installed DC watt.

The current pumping operation at Wilson Reservoir utilizes a significant amount of electricity in the high peak electrical demand period between noon and 6 PM on weekdays, to meet the City's water demands. With the way the pumps at Wilson are operated today, a 140 kW

solar project at the site could reduce the electric bill at Wilson by about \$32,000 annually, or about 14 cents/kWh generated. However, most of this benefit would be derived through changing the electric rate to a renewable rate that would virtually eliminate electric demand charges which are a major component of the site's current electric bill.

However, the current pumping operation is required to closely follow water demand as the City's largest water storage facility, Garfield Reservoir, is currently being reconstructed and is out of service. Once Garfield is back in service in 2017, Wilson's pumping operations will likely be modified to significantly reduce high electric demand on weekday afternoons. With this modified operation, the electric bill at Wilson could be reduced by about \$60,000 annually, even before solar is installed. With this modified future pumping operation, the benefits of solar are reduced to about \$17,000 annually, or about 8 cents/kWh generated, which is still beneficial. As can be seen in Figure 6 the net is slightly negative up until year 10. However we wish to emphasize that the model used in this prediction was conservative at every turn. What is shown in Figure 6 is a conservative savings scenario.

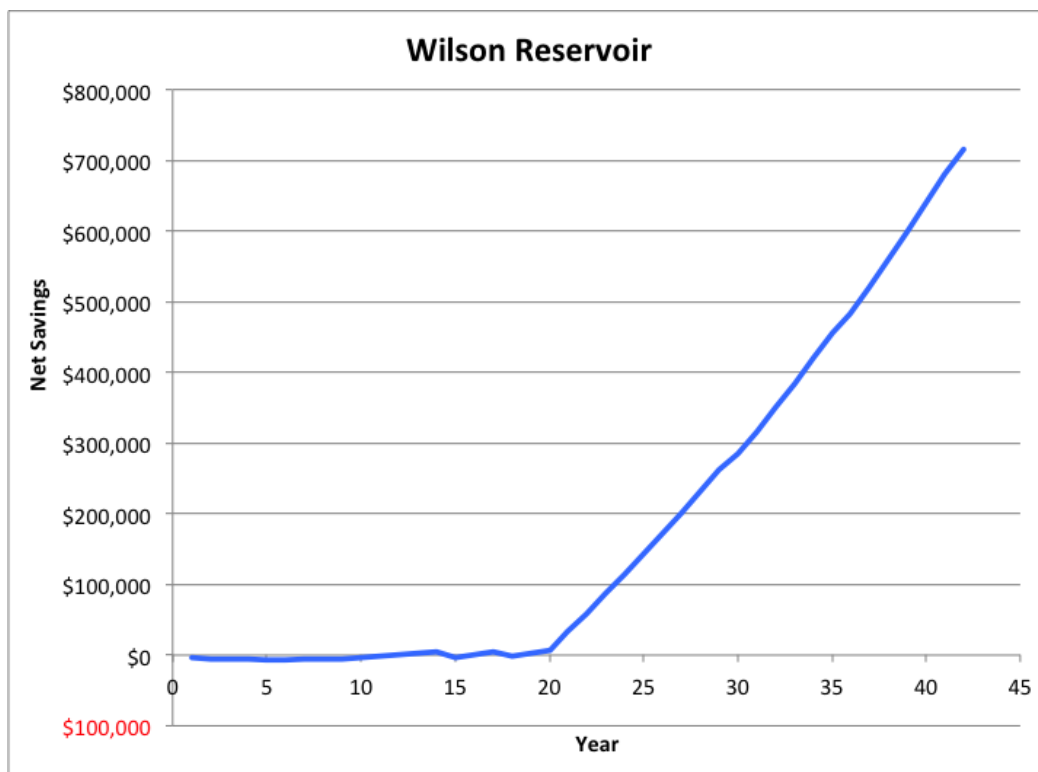


Figure 6: The cumulative net monetary effect on the City based on ECAA financing for the Wilson Reservoir solar installation.

Finally while it might appear that the net savings are more favorable for City Hall than for Wilson on the basis of Figures 6 and 9, see below, this is an apples-to-oranges comparison as the savings for Wilson were computed under more conservative assumptions.

Appendix B - Proposed City Hall Parking Lot Solar Project Details

City Hall is also a major user of energy (9% of City usage overall) and there are parking lots with plenty of unshaded areas both behind and adjacent to City Hall as shown in Figure 7.



Figure 7: City Hall showing parking lots. The northeast parking lot is public parking. The one to the north is parking for City Hall.

In March, 2016 three solar companies performed site visits in order to prepare informal proposals for solar installations on the City Hall parking lots. In addition to potential energy savings, such systems provide shade for vehicles and are easily visible to residents and others. We also asked firms to investigate solar arrays on top of City Hall, but determined that the roof was not conducive to a solar installation.

Informal proposals were received from two of the firms, with cost estimates of \$3.70-\$3.86/watt. The two firms had slightly different sized installations (Figure 8), so overall cost varied from \$780k to \$965k



Figure 8: Proposed solar installations for City Hall parking lots.

In either case the energy savings are substantial, on the order of \$0.12 - \$0.13/kWh and accounting for a 71% offset of City Hall usage, with a savings of \$45k - \$53k in electricity costs in year 1. Figure 9 shows the potential increase in the general fund over time if solar is installed on the City Hall parking lots. This plot shows positive net impact from year 1 even with conservative assumptions.

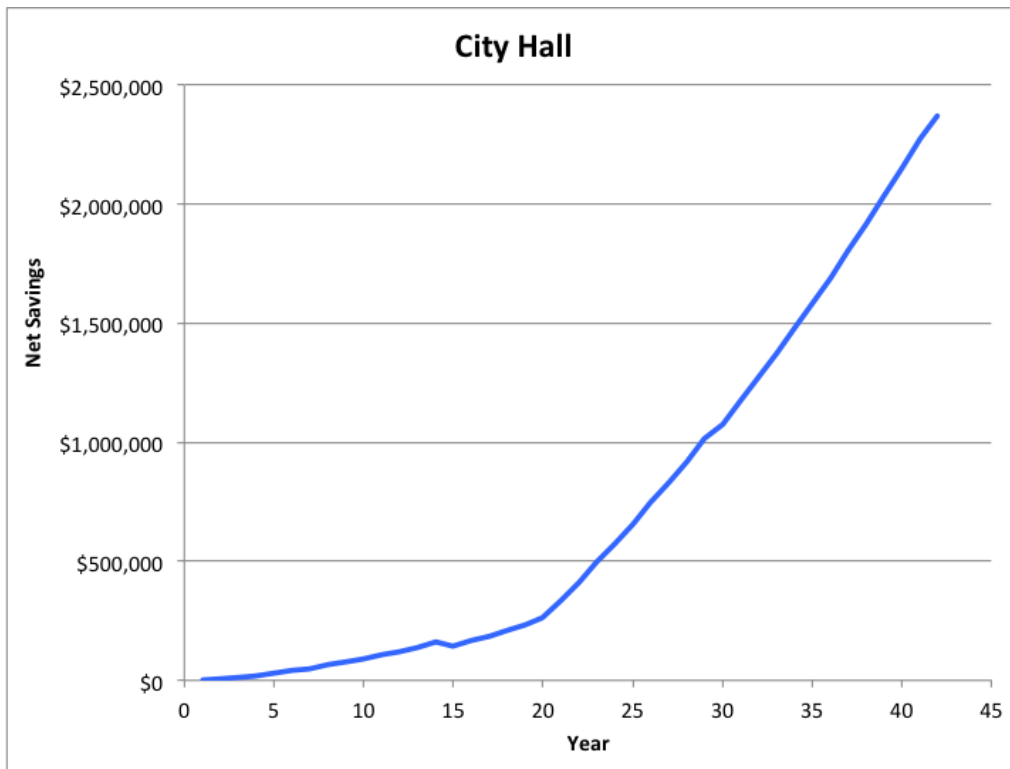


Figure 9: The cumulative net monetary effect on the City based on ECAA financing for the City Hall solar installation.