

Agenda Report

March 5, 2012

TO: Honorable Mayor and City Council

Through: Municipal Services Committee (February 28, 2012)

FROM: Water and Power Department

SUBJECT: ADOPT THE 2012 UPDATE TO THE 2009 INTEGRATED RESOURCE PLAN AND REVISED VOLUNTARY RENEWABLE PORTFOLIO STANDARD AND INITIATE A STUDY OF THE VIABILITY OF ENERGY STORAGE SYSTEMS

RECOMMENDATION

It is recommended that the City Council:

1. Find that the recommended update to the 2009 Integrated Resource Plan and the adoption of the 2012 Renewable Portfolio Standard are exempt from the California Environmental Quality Act ("CEQA") pursuant to State CEQA Guidelines Section 15262 (Feasibility and Planning Studies), and find that a study of energy storage systems is not a "project" pursuant to State CEQA Guidelines Section 15378;
2. Adopt the 2012 Update to the 2009 Integrated Resource Plan ("2012 IRP"), as described herein and in the report, prepared by Pace Global Energy Services, LLC ("Pace"), attached hereto as Exhibit 1;
3. Adopt the revised voluntary 2012 Renewable Portfolio Standard ("RPS"), attached hereto as Exhibit 2; and;
4. Direct the Pasadena Water and Power Department ("PWP") to assess the potential viability and cost-effective energy storage systems, and to determine appropriate targets, if any, to be achieved.

ENVIRONMENTAL ADVISORY COMMISSION RECOMMENDATION

The Environmental Advisory Commission supported staff recommendations at their February 21, 2012 meeting.

EXECUTIVE SUMMARY

On March 16, 2009, the City Council approved an Integrated Resource Plan for power resources ("2009 IRP") which among other objectives committed the City of Pasadena ("City") to a goal of obtaining 40% of its energy from renewable resources by 2020 and reducing its greenhouse gas emission by 40%, also by 2020. Since adopting this plan, the state of California has passed legislation requiring all utilities to achieve a 33% renewable resource goal by 2020; the City has experienced various effects from the national economic decline; electrical demand has declined; renewable resource costs have increased; and the state has adopted a cap and trade program which places added costs on carbon that will affect PWP's energy portfolio costs going forward.

The City Council directed PWP to update the resource plan. PWP retained Pace, the consultant which provided the original 2009 IRP recommendations, to update the analysis and provide an assessment of the cost of achieving the 2009 IRP goals. The Council also asked PWP to assess whether the City of Pasadena's customers were still supportive of the extra costs associated with meeting the aggressive goals of the 2009 IRP.

The analyses performed by Pace utilized revised forecasts for PWP's electrical sales and market prices, reflects progress to date in acquiring renewable resources, and incorporates updated energy conservation goals adopted by the City Council. It incorporates the planning goals and objectives laid out through the extensive 2009 IRP stakeholder process.

Pace analyzed the costs and environmental performance of PWP's "status quo" portfolio, and the costs associated with alternative energy portfolios capable of meeting the state-mandated 33% renewable standard, and the City's 40% goal, which is voluntary on the City's part. The 40% RPS goal by 2020 was considered under two scenarios, one having an intermediate goal of 33% by 2015 as per the 2009 IRP, and another assuming a more linearly progression towards 40% by 2020 without any intermediate goals. Pace developed several portfolios to meet these objectives and tested them against the risks arising from various potential policy and market conditions ranging from extremely green to least cost domestic energy legislative policies. The results of Pace's analysis show:

1. Future rate increases would occur under any portfolio model, including the status quo, due to mandated 33% renewable procurement policies imposed by the state, implementation of the state's cap and trade program, and projected increased market prices for conventional energy resources;
2. To meet the mandatory 33% RPS goal, the energy portion of the customer bill increases by 9% compared to current bills on an average (levelized) basis through 2030, in constant 2011 dollars; and,

3. On a similar basis, Pasadena's 40% renewable goal would increase the energy portion of the customer bill by an additional 3%, for a combined increase of 12%.

Given the relatively moderate increase in the energy portion of the customer bill for exceeding the state-mandated 33% renewable target, PWP recommends that the voluntary 40% RPS goal by 2020 remain unchanged. As indicated above, the 2009 IRP set an intermediate milestone of 33% by 2015, five years before the state's mandate. PWP recommends eliminating this intermediate milestone. This will enable PWP to procure renewable resources at a measured pace and reduce customer rate impacts that are likely to occur from the more aggressive procurement needed to achieve 33% by 2015. The City will still be positioned to exceed state-mandated levels through 2020 and beyond if it chooses. As conditions change in future years, the City will be able to reassess this decision at reasonable intervals, and accelerate the rate of renewable procurement if desired.

The recommended 2012 IRP update is a minor update of the approved 2009 IRP. The revised RPS milestones and target dates set forth in Exhibit 2 are the key difference. The proposed RPS policy also clarifies that the City's decision to exceed 33% renewables is a voluntary policy subject to future review by the City Council, and not subject to state enforcement actions pursuant to the state's 33% mandate. The scope of 2012 IRP update did not include analysis of other recommendations of the 2009 IRP, notably a reduced reliance on existing coal resources and the replacement of the Broadway 3 local power plant with an efficient combined-cycle natural gas generator.

In addition to approving the 2012 IRP and RPS goals, a further recommendation is made to assess the potential viability and cost effectiveness of energy storage systems and incorporate the results of such assessment in future resource plan updates and/or distribution planning studies. The recommendation is based on the requirements of Assembly Bill 2514 enacted by the state legislature in 2010 ("AB-2514"). It requires that utilities start such evaluations by March 1, 2012 and that governing boards such as the City Council set appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems by October 1, 2014. Energy storage is a potential means of managing the variability of renewable resources such as wind and solar, enabling the electric grid to operate more reliably as more renewable resources are added statewide.

BACKGROUND

Integrated resource plans are tools used to establish the policy framework for procurement of resources to meet electric energy demand, considering both supply (generation) and demand (conservation, demand response) resources. PWP typically performs an in-depth Integrated Resource Plan ("IRP") every five years, with less extensive updates performed as conditions warrant. Following two years of extensive analysis, stakeholder meetings, and public input, the City Council approved the 2009 IRP, which was prepared by PWP with the assistance of Pace, on March 16, 2009.

A number of conditions have changed since completing the 2009 IRP. The state has mandated RPS legislation pursuant to Senate Bill X1-2 and adopted a GHG cap and trade program. Increasing demand for renewable resources has driven up their price. The economic downturn has reduced Pasadena's electricity demand and market prices of electricity and fuels have dropped to historic low levels. PWP has secured a number of long-term renewable resources and congress has authorized an extension of PWP's contract for Hoover Hydro for another fifty years.

The 2012 IRP update is limited in scope yet takes a comprehensive long-term look at key assumptions, the City's policies, current and future expected legislative and regulatory conditions, ratepayers' preferences, and economic conditions. Pace's proprietary screening model evaluated costs and environmental performance of various portfolio options under extreme states-of-the-worlds policies and market conditions such as extremely green, least cost, no-nuclear and only-domestic energy legislative policies.

Summary of 2012 IRP Update

The 2012 IRP is an update of the 2009 IRP, and incorporates all of the prior key recommendations with some minor revisions, as summarized in Table I.

Table I
 Comparison of 2009 IRP and 2012 IRP Update Recommendations

Recommendation	2009 IRP	2012 IRP
Renewable Energy: RPS	15% RPS by 2010; 33% by 2015; and 40% by 2020;	40% by 2020; Meet/exceed mandated level (Achieved 15% RPS by 2010)
Renewable Energy: Local Solar	15 MW by 2020; 19 MW by 2024	No change
Renewable Energy: Feed-in-Tariff (qualifying renewable resources located inside the City)	8 MW by 2020; 10 MW by 2023	Delayed as follows: ¹ 5 MW by 2020; 10 MW by 2027
Coal Power Displacement:	Reduce coal purchases by at least 35 MW by 2016;	No change
New Local Gas-Fired Generation:	Replace Broadway power plant with a comparably sized new combined cycle plant by 2014	Expected by 2015
Energy Savings:	Incorporate adopted 2007 Energy Efficiency Goals	Incorporate adopted 2010 Energy Efficiency Goals
Additional Demand Response:	Additional 5 MW by 2012 through incentives and programs	No change
GHG Emissions Reductions:	5% by 2010; 25% by 2015; and, 40% by 2020.	No change
Upgrades of Existing Generation:	Continue to maintain and upgrade Glenarm Units 1 and 2 to extend their lives through 2030	No change

1: Feed-in-tariff goals starting in 2010 could not be achieved due to lack of credible response to PWP request for proposals, and later federal regulatory restrictions. PWP expects realistically goals are achievable starting 2014.

Summary of Key Assumptions and Findings by Pace

The findings of the Pace report include the following:

- Forecast market prices for natural gas, spot market power, and GHG emissions compliance costs are lower than those used for the 2009 IRP analysis.
- Forecast costs for new renewable resources are higher than those used for the 2009 IRP analysis.
- The value of PWP’s GHG allowance allocation substantially offsets expected GHG reduction compliance costs.
- The cost increases for all portfolios examined in the 2012 IRP update are less than the cost increases determined in the 2009 IRP.
- Increasing RPS targets leads to higher portfolio costs. Every 1% increase in RPS percentage by 2020 is associated with an increase of \$0.002/kWh in portfolio costs on a levelized basis.
- Likewise, increasing energy efficiency and demand response deployment beyond levels in the adopted 2010 Energy Efficiency and Demand Response goals leads to higher portfolio costs.
- Higher renewable percentages can help mitigate risks associated with higher than expected natural gas and CO2 compliance costs, but result in a more sizeable premium over the status quo if a low natural gas/CO2 price environment persists.

Cost and Bill Impacts

Table II summarizes the estimated portfolio cost impacts during the next twenty years from the Pace report:

Table II
 Estimated levelized PWP portfolio cost impacts (in Nominal \$2011)

Time Period	33% RPS vs. Status Quo	40% RPS (linearly increasing) vs. Status Quo	33% in 2015/ 40% in 2020 vs. Status Quo
2013-2017	4.3%	7%	8.1%
2013-2022	7%	9.8%	10.6%
2013-2030	4.7%	7.3%	7.7%

Status Quo scenario represents that going forward PWP would not make any incremental changes to its existing portfolio, in other words it is a ‘do-nothing’ option. Table II shows cost impacts of 33% and 40% RPS portfolios in comparison to Status quo. Status Quo option is ruled out as it will violate legislative requirements and expose PWP to high amount of penalties. Energy portfolio procurement costs are passed through to PWP’s retail customers in the Electric Energy Charge component of the bill. Any energy procurement cost increases are spread to all customers on an equal dollar

per kWh basis, thus, all customers see bill increases in the Electric Energy Charge proportion of their bill in direct proportion to their energy consumption.

The rate and bill impact comparisons provided in this report do not include the impact of future increases to the transmission, distribution and Public Benefit Charge rates that likely will be implemented over time. The energy cost portion of customer bills can vary from less than 50% for the smaller residential customers to over 80% for large commercial customers.

The estimated impacts on the average residential customer bill during the next ten years are shown in Table III:

Table III
 Estimated Monthly Bill for Average Residential Customer Using 500kWh/month

Monthly Electricity Bill (Current monthly Bill is \$84)	2013-2017	2013-2022
33% RPS	\$85	\$86
40% RPS	\$86	\$87

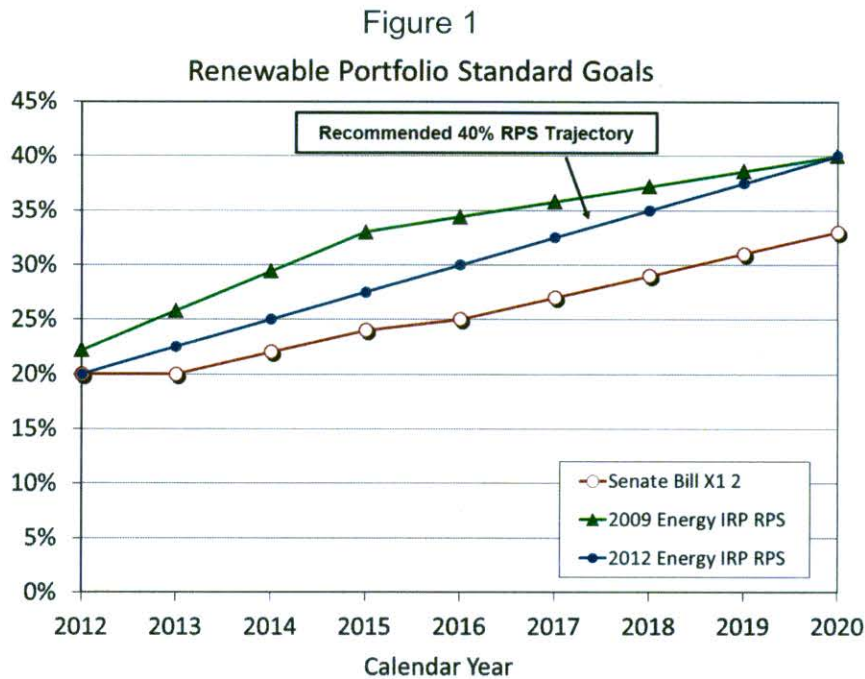
Note: Amounts rounded to the nearest dollar as levelized Nominal 2011 \$

Customer Surveys

PWP surveyed 872 residential and 96 business customers to evaluate rate payers' level of willingness to pay for renewable energy over the state's mandate. The results indicated 52% of residential and 71% of business customers were not willing to pay any more while the rest were willing to pay 5 to 25% additional amounts. The consumer's decline in willingness to pay for going extra green compared to a similar survey conducted in 2008 can be attributed to the current economic conditions. It should be noted that the questions in these surveys were not identical but carried the same intent. While a majority of surveys were done in person at public places, utility bill inserts and web based survey methods were also used. Additional survey details and results may be found in Exhibit 1.

Recommended RPS

The recommended portfolio of resources to achieve 40% RPS by 2020 on a linear path as shown in Figure 1 provides a sustainable balance between environmental benefits, reliability, and cost of electricity to PWP's electric rate payers under a wide variety of market, regulatory, and economic conditions. It is consistent with the City of Pasadena's objective to be a leader in environmental stewardship. In particular, it would help meet, or exceed, its United Nations Urban Environmental Accords ("Urban Accords") goals related to energy efficiency, renewable energy use, and greenhouse gas emissions.



Energy Storage

Renewable resources can be unpredictable, produce energy when it is not needed, and vary considerably from moment to moment as weather conditions change. Energy storage is a potential means to manage excess generation and smooth out such “intermittent” resources, enabling the electric grid to operate efficiently and reliably even as more and more renewable resources are added to the grid and aging thermal power plants are retired.

Consistent with state policies to encourage distributed and renewable resources, the legislature enacted AB-2514 to require that electric utilities evaluate energy storage resources to facilitate the goals of reliability and efficiency. The law requires that utilities commence evaluations by March 1, 2012, and that governing boards such as the City Council determine appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems by October 1, 2014. Similar to statutory requirements for energy efficiency targets, the Council must reevaluate energy storage targets every three years. PWP must report to the California Energy Committee (“CEC”) the targets, if any, and policies adopted by Council and any changes made. Staff’s recommendation is intended to ensure compliance with AB-2514.

Uncertainties/Risks

As with any the long-term plan, there are many assumptions with varying degrees of uncertainty and associated risk. While several key pieces of legislation that establish more clear environmental policy directive have been enacted, many of the regulatory details with respect to renewable procurement and GHG emissions reduction remain unresolved. Future changes in requirements and legislative initiatives will likely require flexibility in PWP’s implementation of the 2012 IRP.

The availability and connectivity of renewable resources will be a challenge to implementing the 2012 IRP goals. Sellers' access to financing, ability to meet commissioning dates or project completion, inordinate delays in projects under development due to lack of financing, permitting, inexperienced developers, cost overruns, and inadequate transmission still cause problems.

While environmental stewardship remains a strong goal for the City and much of PWP's customer base, this sentiment can change over time. PWP's customers currently express a somewhat diminished willingness to pay a premium for additional renewable resources, a trend that could continue or reverse in the future.

Meeting the 2012 IRP goals will require substantial long-term commitments. As technologies and demand for renewable resources evolve, their cost may increase or decrease in the future, putting past commitments at risk of being uneconomic.

CITY COUNCIL POLICY CONSIDERATION

The 2012 IRP is consistent with the City's Urban Environmental Accords Goals with respect to increasing renewable energy and reducing greenhouse gas emissions, the General Plan Energy Element, the City Council's Strategic Planning Goals, and furthers the goals set in the 2009 IRP. Implementation of the 2012 IRP will help the City meet the following Urban Accords goals:

- A. Action 1- Renewable Energy: Adopt and implement a policy to increase the use of renewable energy to meet 10% of the City's peak load by 2012;
- B. Action 2- Energy Efficiency: Adopt and implement a policy to reduce the City's peak load by 10% by 2012 through energy efficiency, shifting the timing of energy demands, and conservation measures; and
- C. Action 3- Climate Change: Adopt a Citywide GHG reduction plan that reduces the jurisdiction's emissions by 25% by 2030.

ENVIRONMENTAL ANALYSIS

On March 11, 2009, the City Council found that the adoption of the 2009 IRP and RPS were exempt from review pursuant to State CEQA Guidelines Sections 15262 and 15271. CEQA exempts from its application those projects that involve "only feasibility or planning studies for possible future actions, which the agency, board or commission has not approved, adopted, or funded..." and, which do not have a legally binding effect on later activities. (State CEQA Guidelines §15262). To fall under this exemption, however, the lead agency is required to consider environmental factors.

Like the 2009 documents, the 2012 IRP and RPS are guidance documents, which do not commit the City to undertaking any particular project. Furthermore, they do not serve as legally binding plans with which subsequent activities must be consistent or adhere.

The 2012 IRP is drafted, in part, with environmental factors under consideration. One of the primary goals of the IRP and RPS is to reduce the environmental impact of the City's overall energy portfolio, particularly with regard to greenhouse gases. Further, any specific construction project undertaken pursuant to the 2012 IRP and RPS will be subject to full CEQA review at the appropriate time.

This action also directs staff to begin the study of energy storage systems. Such a study is not a "project" as defined in State CEQA Guidelines Section 15378 because the study itself does not have any potential for resulting in any direct or indirect environmental effect. Any recommended actions or policies that may come out of the study will be subject to the appropriate environmental review at a later time.

FISCAL IMPACT:

Approval of the 2012 IRP and revised RPS will have no immediate fiscal impact. The 2012 IRP recommendations will, however, establish the policy guidance and framework to evaluate power resource and program choices with potential substantial cost implications for PWP and its electric ratepayers. Over a 20 year period, Pace estimates that implementation of the recommended 40% RPS goal would result in a 11.7% increase in PWP's portfolio cost average levelized energy in 2011 nominal dollars.

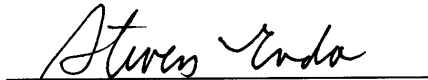
The increase in PWP's energy cost is passed to the customers through power cost adjustment charge.

Respectfully submitted,



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Exhibit 1: 2012 Integrated Resource Plan Update prepared by Pace Global Energy Services
Exhibit 2: Revised Renewable Portfolio Standard Policy