

# Agenda Report

March 21, 2011

**TO:** Honorable Mayor and City Council

**THROUGH:** Municipal Services Committee (February 22, 2011)

**FROM:** Water and Power

**SUBJECT: RENEWABLE ENERGY PROCUREMENT STATUS, REQUIREMENTS, AND ESTIMATED RATE IMPACTS**

## **RECOMMENDATION:**

This report is for information only.

## **EXECUTIVE SUMMARY:**

This report provides an update on the City of Pasadena's (City) progress towards meeting renewable energy procurement goals set forth in the 2009 Power Integrated Resource Plan (IRP) and describes the actual cost impacts for calendar year 2010. It compares future renewable energy goals in the IRP with state regulations and estimates their future rate impacts. It describes some of the IRP implementation challenges as well as changing conditions that have occurred since it was adopted.

The 2009 Power IRP was adopted by the City Council in March 2009. It established a 20-year road map for Pasadena Water and Power (PWP) to increase its renewable energy supply to meet 40% of retail sales by 2020 and reduce greenhouse gas (GHG) emissions by 40% of 2008 levels by 2020. PWP has achieved the IRP's renewable energy goal of 15% by the year 2010, using mostly renewable energy contracts, with a small shortfall made up by purchasing certified Renewable Energy Credits (RECs). PWP will continue to implement this strategy through 2012, while continuously monitoring evolving regulations and markets. PWP will apprise the Council of any significant milestones or changed conditions as they occur, and will review the IRP policy and strategies with the Council on an annual basis.

During 2010, the California Air Resources Board (CARB) adopted two key regulations to reduce greenhouse gas (GHG) emissions: (i) Renewable Electricity Standard (RES), and (ii) Cap and Trade. The city's IRP goals are marginally higher than the state regulations until 2012 and considerably higher in later years.

To date, implementation of the IRP has not resulted in significant cost or rate increases. Barring unexpected increases in energy costs or legislative requirements, no rate increases are currently anticipated to be necessary through June 2012. However, continually increasing costs for renewable energy and GHG emission reductions requirements are expected to result in higher rates in later years. In order to meet the IRP goals and the state's mandatory requirements in the near term, PWP plans to:

- 1) Continue efforts to achieve the IRP's renewable energy target for 22% by 2012;
- 2) Meet compliance obligations using a combination of mechanisms allowed by CARB, the California Energy Commission (CEC), and state legislation. These include procurement of renewable electric energy or fuel, RECs, and GHG allowances and offsets; and
- 3) Sell any GHG allowances in excess of our Cap and Trade compliance obligation.

PWP will provide an analysis of cost impacts and propose a compliance plan for future years during its annual IRP update to the Environmental Advisory Commission (EAC), the Municipal Services Committee (MSC) and the City Council later this year when regulatory requirements are expected to be more definitive.

**BACKGROUND:**

On March 16, 2009, the City Council adopted the 2009 Power IRP which provided a 20-year road map for PWP to increase renewable energy content to 40% of retail sales by 2020 and to reduce GHG emissions by 40% of 2008 levels by 2020. As shown in Table I, 15% of Pasadena's energy came from renewable resources in calendar year 2010, consistent with IRP goals.

**Table I: 2010 Renewable Resource Mix**

Retail Sales and Renewable Sources	RES Supply & Demand (Excludes Sales to Green Power Customers)		Sales to 100% Green Power Customers	
	MWh	% of Retail Sales	MWh	% of Retail Sales
Retail Sales	1,130,204		13,923	
Long Term Contracts	100,311	8.9%	2,089	15.0%
Short Term Contracts	64,307	5.7%		0.0%
CEC Certified RECS <sup>1</sup>	5,000	0.4%		0.0%
Green-e Certified RECS <sup>2</sup>			11,835	85.0%
<b>Total Renewable Resources</b>	<b>169,618</b>	<b>15.0%</b>	<b>13,923</b>	<b>100.0%</b>

<sup>1</sup> CEC Certified RECS qualify for compliance with California RES regulations

<sup>2</sup> Green-e is a national independent consumer protection program for the sale of renewable energy in the retail market. Green-e verifies that renewable energy was generated and delivered to retail customers.

Table II shows the actual cost of renewable energy resources procured by PWP in 2010 compared to an equivalent amount of non-renewable energy at average market prices for 2010.

**Table II: Calendar Year 2010 Actual Renewable Resource Costs**

Renewable Energy Resources	Energy (MWh)	Cost (\$000)	Estimated Market Value of Non-Renewable Energy* (\$)
Minnesota Methane Landfill	55,433	3,858	1,958
Ameresco Landfill Gas Gen	5,353	349	190
Ormat Geothermal	17,957	1,242	634
Milford Wind	7,108	605	251
PPM Iberdrola Wind	14,460	774	511
<b>Long Term Resources</b>	<b>100,311</b>	<b>6,827</b>	<b>3,543</b>
Short Term Landfill Gas	35,336	2,747	1,248
Short Term Wind	28,971	1,861	1,023
Certified RECS	5,000	38	0
<b>Total Renewables</b>	<b>169,618</b>	<b>11,472</b>	<b>5,814</b>
<b>Additional cost of renewable energy (compared to market value of non-renewable energy) (\$000)</b>			<b>\$ 5,658 (97% Premium)</b>

*\*The average spot market price for non-renewable energy was \$35 per MWh in 2010, compared to expected prices of \$50-60 per MWh.*

Thus far, implementation of the IRP has not resulted in any rate increases. Table II shows that renewable resources cost approximately \$5.7 million more than an equivalent amount of spot market energy would have cost in 2010. This premium is a result of relatively low spot market prices for energy in calendar year 2010. For reference, the delivered cost of energy from coal fired Intermountain Power Project was approximately 55% higher than the equivalent amount of non-renewable spot market energy. These lower spot market energy prices have enabled PWP to maintain overall energy procurement costs in line with budget expectations, thus avoiding unplanned increases in energy rates. However, electricity rates are expected to increase in the future due to continually increasing cost of renewable energy, transmission, distribution and public benefit charge, and climate change regulations.

### **RECENT REGULATORY DEVELOPMENTS**

During 2010, the CARB adopted two key regulations affecting PWP: (i) the Renewable Electricity Standard<sup>3</sup>; and, (ii) a Cap and Trade program to be implemented beginning

<sup>3</sup> The renewable energy content of the total power sold to retail customers in a calendar year is referred to as Renewable Portfolio Standard (RPS) in the IRP and RES by regulatory agencies. Both RPS and RES terms are interchangeably used in this report.

January 1, 2012. Under the Cap and Trade regulation for the electric sector, each electric utility such as PWP will be allocated annual GHG allowances (an allowance is defined as one metric ton of GHG emissions). Allocations will decline over time to meet the program's overall reduction objectives. The utilities expect information regarding allowance allocations later this year. These regulations will be further modified during the next few months before they become effective by the end of the year.

The compliance periods for the IRP and the regulations being imposed by state agencies are both based on calendar years. IRP goals are marginally higher than state regulations until 2012 and considerably higher in later years. A comparison of IRP and CARB RES renewable energy goals is shown in Table III.

**Table III: Comparison of IRP RPS and CARB RES**

Calendar Year	IRP RPS	CARB RES
2010	15	None
2011	19	None
2012	22	<b>20</b>
2013	26	<b>20</b>
2014	29	<b>20</b>
2015	<b>33</b>	<b>24</b>
2016	34	<b>24</b>
2017	36	<b>24</b>
2018	37	<b>28</b>
2019	39	<b>28</b>
2020 and annually thereafter	<b>40</b>	<b>33</b>

*Note: Bold numbers under IRP RPS show milestones stated in IRP, non-bold numbers are "soft" interim targets.*

**ALTERNATIVE PORTFOLIOS:**

Three alternative future energy supply portfolios have been modeled to estimate the rate impact of achieving differing levels of renewable resources:

- (A) **Current Portfolio** - Consists of expected energy from PWP's existing and authorized contractual resources, including renewable resources. Non-renewable spot market energy would be used to supply any additional energy needed. This portfolio does not meet legislative and regulatory requirements. Potential penalties for non-compliance are not known and have not been included.
- (B) **CARB RES Portfolio** - Modifies the Current Portfolio by securing sufficient additional renewable resources in order to comply with the CARB RES requirements. Once the CARB RES requirement has been met, non-renewable spot market energy would be used to supply any additional energy needed.

- (C) **IRP RPS Portfolio** - Modifies the Current Portfolio by securing sufficient additional renewable resources in order to comply with Pasadena's IRP RPS goals. Once the IRP RPS target has been met, non-renewable spot market energy would be used to supply any additional energy needed.

Figure 1 depicts the estimated rate impact associated with the varying levels of renewable resource procurement in each of these three portfolios. The "rate impact" represents the additional cost to procure all of the renewable energy (including existing commitments) in each portfolio in lieu of procuring non-renewable energy at forecast spot market prices. These comparisons do not reflect potential rate impacts due to non-renewable energy and fuel costs. Also, potential changes in transmission, distribution, or public benefit charge rates are not included.

**Figure 1: Increased Cost for Renewable Resources ( $\text{¢}/\text{kWh}$ )**

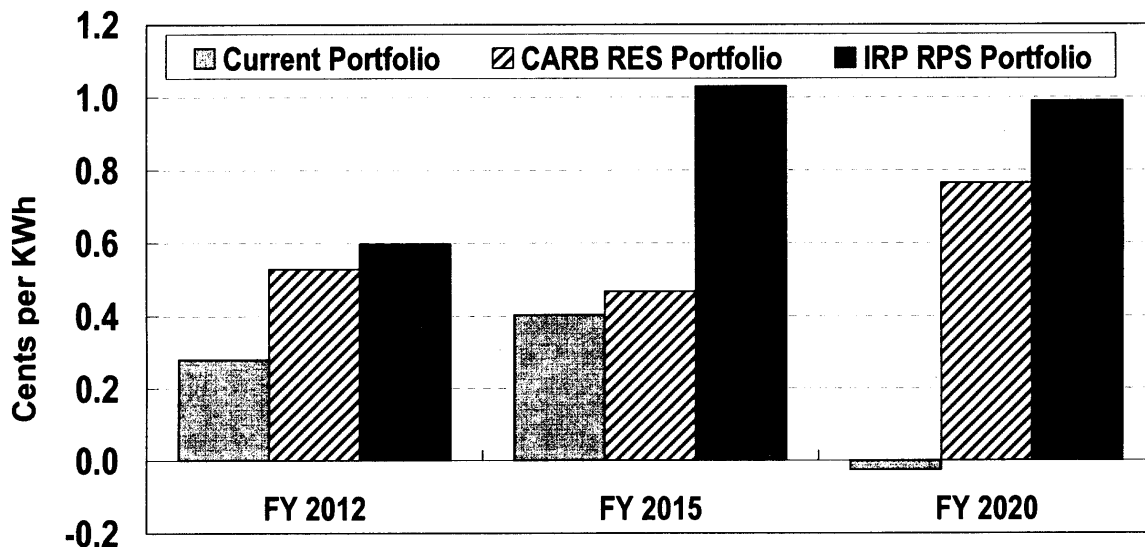


Figure 1 conveys the following key points with respect to renewable energy costs:

- The energy from PWP's current portfolio of renewable resources is expected to cost less than other resources by FY2020, due to escalating market costs for energy;
- The additional costs to meet IRP RPS goals versus the CARB RES requirement are relatively moderate in FY2012 and FY2020; and
- Meeting Pasadena's IRP RPS goals could cost PWP ratepayers an additional 0.5¢/kWh in the intervening years when the IRP goals are substantially higher. Therefore, the rate impacts associated with exceeding CARB RES goals should be carefully considered when securing additional resources to meet the higher goals.

Note that these estimated rate impacts are based on currently available market and regulatory information, and certain assumptions regarding future regulatory compliance, energy and fuel costs and PWP's retail electric sales. Given regulatory and market uncertainties, near term projections (up to the next 2 years) have a higher probability of

holding good than those for later years, although regulatory and market conditions can change quickly and affect the results.

**FUTURE ELECTRIC RATES:**

While implementation of the IRP has not yet resulted in significant cost or rate increases a number of factors will contribute to increasing electric rates in the future. In addition to increased procurement of renewable resources, the underlying cost of energy and natural gas are expected to increase and PWP will likely incur new costs associated with GHG emissions reductions. Furthermore, investment in transmission and distribution infrastructure and customer incentive programs will all contribute to higher average electric rates over time. Ultimately, IRP implementation will put additional upward pressures on the energy charge and public benefits charge rate formulas as PWP acquires additional long-term renewable resources and solar incentive payment obligations accumulate. Table IV lists each component of PWP’s electric rates and summarizes the key factors driving upward rate pressure in the coming years.

**Table IV: Electric Rate Pressures**

Rate Component	Current Avg. Rate	Rate Pressures
PBC	0.58¢	<ul style="list-style-type: none"> <li>• Solar and Energy Efficiency Programs</li> </ul>
Energy	8.53¢	<ul style="list-style-type: none"> <li>• Renewable Resource Acquisition</li> <li>• Feed-in Tariff</li> <li>• Fuel and Spot Market Energy Costs</li> <li>• GHG Mitigation, Credits/Tax</li> </ul>
Transmission	0.82¢	<ul style="list-style-type: none"> <li>• CAISO Transmission Rate</li> </ul>
Distribution	4.28¢	<ul style="list-style-type: none"> <li>• Infrastructure Replacement</li> <li>• Smart Grid</li> </ul>
Total	14.21¢	

**REVIEW OF 2009 IRP ASSUMPTIONS:**

Some of the key assumptions used in the IRP to develop a 20-year road map for the energy policy have not materialized. Spot market energy and natural gas fuel prices have been lower than IRP assumptions. Due to the economic downturn, PWP’s retail sales are about 4% lower than IRP projections. The renewable energy resources are not as readily available as anticipated by the IRP. Due to anticipated GHG costs associated with coal power, potential purchasers are reluctant to buy the Intermountain Power Project’s coal power on a long-term basis. The IRP assumed all renewable energy would be exempted from the GHG obligation; however, depending upon resource type, location, method of delivery, and the date of the contract, some renewable resources are not GHG-free under the CARB regulations.

**CHALLENGES:**

Renewable energy procurement challenges continue. They include unavailability of operational or “shovel-ready” projects, a limited supply of viable future projects with

appropriate transmission access, constricted financing, increasing costs and operational issues related to intermittent wind and solar resources. Most contracts currently under negotiation are not expected to be developed for at least two to three years.

PWP delivers energy from in-state and out-of-state renewable resources to Pasadena through the California Independent System Operator (CAISO), which is an independent non-profit organization managing most of California's transmission system. Currently, the CAISO does not allow wind and solar energy generated outside California to be imported directly. While PWP has worked out alternative arrangements to bring energy from its out-of-state wind resource to Pasadena, these arrangements are costly and may result in added GHG emissions costs or disqualification of the energy from meeting the CARB RES.

Changes in PWP's electric sales will impact renewable energy needs and can lead to additional rate pressures. PWP's electric sales have recently declined by about 4% due to the economy and success in energy efficiency programs. The potential deployment of customer-owned distributed generation resources or revitalization of retail competition could further reduce PWP's electric sales, resulting in upward pressure on rates to recover fixed costs. Conversely, unexpected increases in retail sales would increase renewable procurement requirements at a potentially very high cost.

#### ***UNCERTAINTIES:***

Continually evolving state and federal legislative and environmental regulations create the biggest uncertainty in PWP's long-term energy plan. In California, the implementation of RES and Cap and Trade programs pursuant to Assembly Bill 32 (Global Warming Solutions Act of 2006) is currently facing a legal challenge, and federal climate initiatives are on hold. The CARB is just now issuing its GHG allowance allocation methodology under their proposed Cap and Trade program which will be implemented effective January 1, 2012. The uncertainty of the amount of free GHG allowances that CARB would allocate to PWP for each year starting 2012 creates a challenge to developing a cost effective long-term compliance strategy. Recently proposed California legislation (Senate Bill 1X 2, formerly SB 23) establishing the 33% by 2020 renewable standard as state law, if enacted, includes delivery requirements that would considerably change the existing RES regulation.

#### ***IMPLEMENTATION STRATEGY:***

Through a mix of long-term renewable resource contracts and short-term procurement, PWP will continue to pursue meeting the IRP RPS goals in the near term. This strategy should result in exceeding CARB RES requirements, thus providing a safety margin in the event that PWP's electric demand increases unexpectedly or certain renewable resources do not perform as expected. Also, this strategy should result in lower potential exposure to RES or GHG compliance costs or penalties. The long-term resources provide greater certainty and rate stability, but are currently scarce and have a higher cost premium. Short-term renewable resources, including RECs, provide flexibility to meet marginal needs and unexpected conditions. They are currently available and cost-effective, but subject to substantial cost volatility as markets and regulatory requirements evolve. PWP may dispose of any renewable energy or GHG

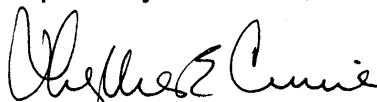
allowances in excess of compliance goals in order to minimize rate impact on Pasadena rate payers.

PWP will continue to provide annual IRP updates to the EAC, MSC and the City Council, while continuously monitoring market conditions and regulatory requirements that may warrant policy or strategy changes.

**FISCAL IMPACT:**

No rate increase is proposed at this time. Energy supply costs are expected to increase in future years due to increased costs for renewable energy procurement and compliance with GHG emission reduction regulations and legislation; however, exact amounts and the timing can not be estimated at this time due to market and regulatory uncertainties. PWP's investment in aging distribution infrastructure, CAISO transmission cost increases, and incentive costs for solar and energy efficiency will apply additional pressures to increase electric rates over time.

Respectfully submitted,



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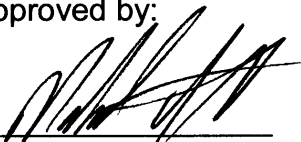
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