



WENDY GREUEL  
CONTROLLER

April 7, 2011

Honorable Antonio R. Villaraigosa, Mayor  
Honorable Carmen Trutanich, City Attorney  
Honorable Members of the City Council  
of the City of Los Angeles

For our City to truly be “world class”, we must increase our use of clean renewable energy sources, including power derived from wind, solar, and geothermal sources and, ultimately, reduce our reliance on fossil fuels. Increasing the Department’s portfolio of renewable energy would help to reduce pollution, while reducing the rates of asthma and other diseases in our community. For many years, the DWP has had a policy of trying to generate 20% of their energy from renewable sources by 2010 and 33% by 2020.

The attached audit analyzed the Department’s efforts in managing its renewable energy portfolio through 2010 and examined whether it is well positioned to meet future renewable energy requirements. The audit found that DWP has recently begun to improve the linkage between the RPS plans and its financial plans. However, the audit also revealed serious cause for concern, specifically, the absence of a comprehensive financial plan for the renewable program.

While the DWP’s unaudited numbers state that they achieved the goal of 20% renewable energy by 2010, it appears that this was likely due more to luck than to strong planning and policies. Our auditors estimate that the DWP only achieved a 20% renewable energy portfolio due to abnormally cool temperatures and higher than expected wind at Department owned wind farms. If temperatures and wind rates had been at expected levels, the Department would have only achieved a 18% renewable energy portfolio.

It appears that the Department’s “plan” for achieving the 20% goal was accomplished by incurring renewable energy costs with little discussion on the impact to the ratepayers. The Department’s percentage of renewable energy that is owned by the Department – and therefore the costs associated with it are more stable - went from 79% in 2004-05 to 23% in 2009-10. Additionally, the Department’s recent actions of suspending

spending on new renewables until a clear funding source could be identified put their ability to achieve future renewable goals in jeopardy.

While these findings are disappointing, I want this audit to be used as a roadmap for how the Department can move forward to achieve the longer term goal of sustainably – and cost effectively – going green.


What is of great concern, however, is whether the mandated goals set for 2020 can be achieved. With looming requirements coming from the implementation of AB 32 and the Governor's Executive Order requiring 33% renewable energy by 2020, if we do not increase our renewable portfolio to that level, we will likely face penalties from the State that could be significantly more costly than the purchase of a wind farm or solar panel.

If we choose to delay investment in renewable energy now, we will be forced to purchase more renewable energy on the open market as the 2020 deadline draws near. With other utilities in the same situation, it is very likely that the cost of purchasing power on the open market will rise dramatically as 2020 draws closer. This would force the DWP to increase rates exponentially. Therefore it would be wise for the Department to make the necessary investments now and increase its renewable energy portfolio sooner rather than later. This can only be done, however, if the DWP has a well defined financial plan and funding in support of its operational program to achieve the city's renewable energy goals. In short, the question is not can we afford to go green, but how can we afford not to?

To truly become the greenest big City in America, the DWP must commit to moving beyond achieving short term political goals, and toward creating a transparent and fiscally sustainable process for increasing the Department's renewable energy portfolio. Renewable energy is more than a worthwhile investment, it is an essential one. Ratepayers deserve to know whether promises made to them by city leadership to deliver 33% renewable energy by 2020 are actually going to happen and how they will be achieved.

We have come a long way in Southern California from smoggy days forcing people to stay inside, and clearly, this audit shows that we still have a long way to go. We have two distinct options yet only one clear choice; we can collectively move forward to continue creating an environment and air quality that we can be proud to pass on to future generations, or we can fall prey to cynicism and go back to the smog days of our past.

Sincerely,



WENDY GREUEL  
City Controller



WENDY GREUEL  
CONTROLLER

April 7, 2011

Ronald O. Nichols, General Manager  
Department of Water and Power  
111 N. Hope St., Room 1550  
Los Angeles, CA 90012

Dear Mr. Nichols:

Enclosed is a report entitled "Performance Audit of the Renewable Portfolio Standard Program of the City of Los Angeles Department of Water and Power." A draft of this report was provided to your Department on February 22, 2011. Comments provided by your Department at the March 9, 2011 exit conference were evaluated and considered prior to finalizing this report.

Please review the final report and advise the Controller's Office by May 9, 2011 on planned actions you will take to implement the recommendations. If you have any questions or comments, please contact me at (213) 978-7392.

Sincerely,

A handwritten signature in black ink, appearing to read 'Farid Saffar'.

FARID SAFFAR, CPA  
Director of Auditing

Enclosure

cc: Reverend Jeff Carr, Chief of Staff, Office of the Mayor  
Miguel A. Santana, City Administrative Officer  
June Lagmay, City Clerk  
Gerry F. Miller, Chief Legislative Analyst  
Thomas S. Sayles, President, Board of Water and Power Commissioners  
Independent City Auditors



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April 7, 2011

Wendy Greuel  
City Controller  
City of Los Angeles  
200 North Main Street, Room 300  
Los Angeles, CA 90012  
Dear Ms. Greuel:

NorthStar Consulting Group, Inc. is pleased to present this Performance Audit of the City of Los Angeles Department of Water and Power's (DWP) Renewable Portfolio Standard (RPS) program, performed for the Controller's Office. The primary objective of this audit was to determine whether DWP has efficient and effective processes for implementing the City's RPS to increase the use of wind, solar, geothermal, biomass and small hydroelectric power and meet the goal of achieving 20 percent of the City's electricity needs from clean, renewable sources in 2010 and for the future.

Thank you for providing our firm with the opportunity to conduct this audit for the City of Los Angeles. Pursuant to your request, we are available to present the report to the City Council or other responsible City officials.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas A. Bennett", is written over a light blue horizontal line.

Douglas A. Bennett  
Managing Director

**PERFORMANCE AUDIT OF THE RENEWABLE  
PORTFOLIO STANDARD PROGRAM OF  
THE CITY OF LOS ANGELES DEPARTMENT OF  
WATER AND POWER**

Submitted to the:  
The City of Los Angeles Office of the Controller

200 N. Main Street, Suite 300  
Los Angeles, CA 90012

**April 7, 2011**



**NORTHSTAR CONSULTING GROUP**

MANAGEMENT CONSULTANTS

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## EXECUTIVE SUMMARY

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NorthStar has completed its performance audit of the City of Los Angeles Department of Water and Power's (DWP) Renewable Portfolio Standard (RPS) program, performed for the Controller's Office. The primary objective of this audit is to determine whether DWP has efficient and effective processes for implementing the City's RPS to increase the use of wind, solar, geothermal, biomass and small hydroelectric power and meet the goal of achieving 20 percent of the City's electricity needs from clean, renewable sources in 2010 and for the future.

The audit was performed in accordance with Generally Accepted Government Auditing Standards (GAGAS) and included a review of DWP's activities leading up to and through 2010. Fieldwork was conducted from April through August 2010. NorthStar also performed a benchmark survey as part of the engagement.

### Background

In June 2004, in response to evolving state requirements, the City Council adopted an RPS Framework and requested that DWP achieve 20 percent of energy from renewable sources by 2017 and incorporate RPS requirements into all future system planning. In January 2005, the City Council approved a resolution adopting an interim goal of 13 percent renewables by 2010. In 2005 the City Council and the Mayor recommended accelerating the RPS goal to 20 percent renewables by 2010. In December 2005, the Board of Water and Power Commissioners recommended that DWP accelerate the goal to 20 percent renewables by 2010. On December 13, 2005, DWP management presented a master plan to meet the RPS goal of 20 percent by 2010.

In response to State and City requirements, DWP and the City developed an RPS policy designed to meet State RPS targets and ensure delivery of renewable energy to the Los Angeles basin. In June 2005, the City Council approved DWP's initial RPS policy. The policy:

- Included a goal of increasing DWP's supply of electricity from renewable resources until a target of 20 percent is achieved in 2017, with an interim goal of 13 percent by 2010.
- Defined eligible technologies.
- Required an integrated resource planning process that would not compromise service reliability, competitive rates, or environmental leadership.

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- Established a competitive bid procurement process using least-cost, best-fit criteria.
- Set forth reporting requirements.

The policy has been updated over time to reflect changes in State regulations. In 2008, DWP amended its RPS policy to address the City's goal of 35 percent renewables by 2020.

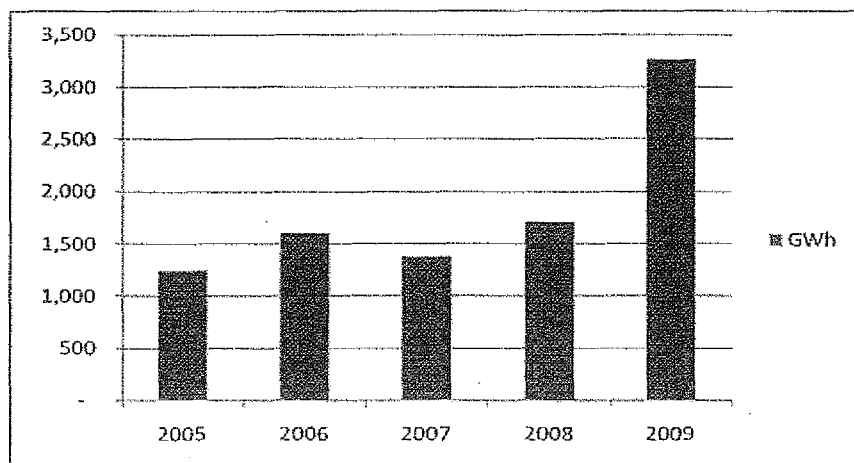
### Summary of Audit Results

In response to City requirements and in accordance with its policy, DWP integrated RPS requirements into its system planning process, increased the amount of renewable generation in its supply portfolio, and, leading up to 2010, was on track to achieve the 20 percent renewables target for 2010.

Prior to April 2010, when DWP's renewable plan changed in response to cost recovery uncertainties, DWP had a projected 18 percent of its RPS requirement under contract. The remaining 2010 requirements would be met through short-term purchases, additional landfill gas contracts, and wind projects currently in negotiation. Based on its then current 2010 load forecast of 23,368 GWh, DWP would require about 4,560 GWh in renewables to achieve the 20 percent target. As of March 2010, DWP had planned to achieve 4,623 GWh of renewable generation in 2010.

DWP has been successful in bringing renewable projects on-line (both DWP-owned and projects under contract) and the amount of renewable resources providing power to the Los Angeles Basin has increased since the RPS was implemented, as shown below.

DWP Reported Renewable Generation



DWP's renewable resources were procured in accordance with a least-cost, best-fit criterion which considered price, resource type, technical feasibility,



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financial stability of the developer, location (both in terms of the location of available resource and its ability to interconnect with DWP's existing, fairly extensive transmission network), and other factors. The majority of the resources were procured through a competitive bid process. DWP also developed a number of innovative contract structures to take advantage of Federal and State tax credits available under the American Recovery and Reinvestment Act (ARRA), which reduced costs.

In April 2010, however, DWP's strategy changed. In response to cost recovery uncertainty, DWP suspended spending on new renewables until a clear funding source could be identified. Three projects either planned or in the negotiation process were deferred as a result of this policy change. Currently, spending on renewables is limited to the amount included in the approved budget.

At the completion of our audit fieldwork in August 2010, DWP projected that it was likely to achieve 18 percent renewables in 2010. In November 2010, DWP projected that it would achieve the 20 percent renewable generation target in 2010 based on the higher than expected wind and hydro performance, low load, and additional short-term renewable purchases in the third quarter of 2010 to meet load requirements. Actual results will vary based on end-of-year wind and aqueduct resource output and total energy sales. As a result of the timing of the reconciliation process, final, audited RPS results for 2010 will not be available until mid- to late-2011. However, absent a renewed focus on the procurement of renewable resources the relative proportion of renewables will decline in future years as existing contracts expire.

While DWP has done a good job on the supply side, deficiencies existed in the integration of supply planning and financial planning and in DWP's approach to the recovery of RPS costs. Renewables can be more expensive than traditional generation resources such as coal or nuclear power plants, and existing utility rates will be inadequate in supporting high levels of renewables.

DWP did not develop an appropriate plan to address the long-term recovery of costs associated with its renewable energy program. Although DWP anticipated the possible need for a renewables surcharge as part of its rates, it did not adopt one. Instead DWP included renewable costs in its Energy Cost Adjustment Factor (ECAF). Since there is a cap on ECAF rate increases, this did not guarantee recovery of renewable costs.

### **Key Findings**

- **DWP's renewable strategy changed in response to cost recovery uncertainties. Achievement of future requirements (i.e., 33 percent by 2020) is also at risk. DWP is pursuing a revised ECAF mechanism but has not explored cost saving initiatives specifically targeted at funding additional renewables.**

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In response to the uncertainty of ECAF funding, in April 2010 DWP suspended short-term wholesale procurement of renewable energy and additional landfill gas procurements, and made approval of renewable projects subject to identification of a clear funding source. At the completion of our audit fieldwork in August 2010, DWP projected that it was likely to achieve 18 percent renewables in 2010. As of November 2010, DWP projected that it may achieve the 20 percent renewable generation target in 2010 based on the higher than expected wind and hydro performance, low load, and additional short-term renewable purchases in the third quarter of 2010 to meet load requirements. Presently there is no assurance that the 20 percent (if achieved) will be sustained even through 2011. Absent a renewed pursuit of RPS goals, renewable production will decline in future years as current contracts expire.

DWP must face the implementation of AB 32 and the inclusion of municipal utilities under Executive Order S-21-09 requiring 33 percent renewable energy in 2020. As the cost of renewable resources is likely to increase as 2020 gets closer, it may be more affordable to secure renewable resources sooner rather than later. Potential regulatory non-compliance due to RPS funding uncertainty presents additional risks.

- **DWP did not develop a well-defined financial plan in support of its operational plans to achieve its RPS goals. The 2007 IRP and financial plans were not adequately integrated and DWP did not develop a comprehensive financial plan for the RPS program.**

The 2007 IRP served as the planning document for RPS implementation and outlines DWP's plans to achieve the 20 percent renewable goal in 2010. The 2007 IRP did not present the overall cost impact of meeting the RPS goals. Activities included in the IRP were incorporated in subsequent budgets but a comprehensive financial plan tied to the IRP does not exist. DWP has recently begun to improve the linkage between its RPS plans and its financial plans. The 2010 Draft IRP includes the estimated rate impact of each of the proposed resource scenarios. DWP plans to develop a detailed rate analysis and a financial plan to support the scenario selected in the final 2010 IRP.

- **As DWP does not separately report overall RPS program costs, it has not adequately communicated the overall, aggregate cost of meeting RPS requirements.**

DWP has a comprehensive Master List of in-service and planned RPS energy sources which provides a forecast of its RPS goal achievement, but does not have a corresponding single, comprehensive renewable energy program budget and financial plan. DWP currently has an established process to track and report its RPS power supply plans and goal achievement; however, it lacks a corresponding process to track and report the budgeted and actual costs of achieving these RPS goals. Without analyzing total cost of the renewable energy

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program, DWP is unable to truly determine, and thus communicate the overall costs of meeting the RPS goals.

- **DWP and its Board approved power purchase contracts without adequately assessing the impact on the ECAF and customer rates. The Board received project cost information as part of the project approval packages, but not information on the effect on the ECAF.**

In 2006, the City Council requested that DWP provide an ECAF impact assessment when presenting renewable energy projects to the Board. Until the fall of 2009, the DWP Board Approval Letters for Power Purchase Agreements simply describe the funding source as: "Funding is budgeted in Power Revenue Fund's Fuel and Purchased Power Budget." There is no discussion regarding the funding impact on the projected ECAF over/under-collection. In 2009, the Board took steps to require an additional financial assessment for large contracts; however, this still does not address the ECAF impact as requested by the City Council. Without an analysis showing the projected impact of a proposed project/contract costs on the ECAF over/under-collection, the Board does not have the requisite information regarding the impact on DWP finances to make an informed decision.

- **DWP did not develop an appropriate plan to address the long-term recovery of costs associated with its renewable energy program, given the cap on ECAF rate increases.**

Although DWP anticipated the potential need for a renewable resources surcharge, it elected to include RPS costs for recovery in its existing, frozen ECAF and did not establish a separate surcharge which would have increased the transparency of RPS program costs. DWP's RPS cost recovery plan was simply to obtain cost recovery through the ECAF. As demonstrated by DWP's suspension of RPS activities when it did not receive adequate ECAF rate increases, this was not an effective long-term RPS cost recovery strategy given the cap on the ECAF.

- **As currently structured, the ECAF does not provide for transparency of RPS costs.**

The current structure of the ECAF and the manner in which costs are recorded precludes easy identification and isolation of the RPS costs. It is currently not possible to isolate the actual RPS costs in the ECAF account as the Purchased Power line is a single line item from the General Ledger which includes both renewable and non-renewable power.

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**Review of Report**

A draft report was provided to DWP on February 22, 2011. We discussed the contents of the report with DWP management at an exit conference held on March 9, and considered their comments in finalizing our report. We would like to thank the DWP management and staff for their cooperation and assistance during the audit.

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**Controller's Accountability Plan**

<b>Recommendation</b>	<b>Page</b>	<b>Mayor Action Req'd</b>	<b>Council Action Required</b>	<b>Dept. Action Required</b>
DWP and the City should: 1. Develop an approach to meeting future RPS targets (i.e., 33 percent by 2020) that complies with applicable regulations and addresses long-term cost recovery issues, in order to prevent deterioration in RPS performance relative to requirements. In developing its approach DWP and the City should: a) Establish specific RPS goals for 2020 to ensure certainty in planning and ensure intermediate RPS goals align with current legislative requirements. b) Evaluate the use and relative economic advantage of tradable RECs and non-certified renewables, to the extent allowed by regulation, as a means of complying with City requirements at a lower cost. c) Determine whether renewable project ownership targets are in the long-term best interest of the City and DWP ratepayers.	35	X	X	Financial Services Organization, Power Supply, DWP Board
DWP should: 2. Establish resource cost benchmarks to be included in resource planning decisions.	35			Power Supply
3. Continue recent efforts to improve the link between the RPS plan and the financial plan to support the execution of the financial plan.	41			Financial Services Organization, Power Supply
4. Develop an integrated financial planning process linking the RPS and the IRP planning process with traditional financial planning requirements to ensure short and long-term solvency of the RPS programs.	41			Financial Services Organization, Power Supply
5. Review the cost of its renewable energy program on a routine basis, and compare actual costs to budget to take steps to address significant variances.	41			Financial Services Organization, Power Supply
6. Manage its efforts to achieve the RPS goals as a comprehensive program and assign an RPS program manager with responsibility for renewable energy RPS goal achievement and associated costs.	41			Power Supply
7. Assess the financial impact of funding its renewable energy projects, including the projected impact on the ECAF balance or	41			Financial Services Org., Power Supply

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<b>Recommendation</b>	<b>Page</b>	<b>Mayor Action Req'd</b>	<b>Council Action Required</b>	<b>Dept. Action Required</b>
other rate mechanism, as part of its renewable project development and approval process.				
8. Include an ECAF or other rate mechanism impact analysis in Board packages for approval of projects over \$5 million.	41			Financial Services Organization, Power Supply
DWP and the City should: 9. Develop a cost recovery mechanism that addresses RPS costs on both a short-term and long-term basis and provides complete transparency of the costs of achieving its RPS goals.	47	X	X	Financial Services Organization, Power Supply, DWP Board
DWP should: 10. Ensure it has the accounting structures in place to isolate and capture all identifiable and incremental RPS costs for recovery. All major categories of costs should be captured.	47			Financial Services Organization, Power Supply

## INTRODUCTION AND BACKGROUND

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A Renewable Portfolio Standard (RPS) is a regulation that requires the increased production of energy from renewable energy sources, such as wind, solar, biomass, and geothermal. The California RPS was established for the purposes of increasing the diversity, reliability, public health and environmental benefits of the energy mix. According to the State Legislature, increased reliance on renewable energy resources may promote stable electricity prices, protect public health, improve environmental quality, stimulate sustainable economic development, create new employment opportunities, and reduce reliance on imported fuels. The development of renewable energy resources may also ameliorate air quality problems throughout the state and improve public health by reducing the burning of fossil fuels and the associated environmental impacts.<sup>1</sup>

Utilities planning and implementing RPS investments face a number of significant challenges, such as:

- Predetermined RPS targets
- Aggressive implementation schedules
- High transition costs
- Cost uncertainty of key commodities, and
- Technological change.

Any one of these factors can, by itself, cause problems for utility planners and policy makers. The fact that they often coexist creates a challenging environment.

- Solar and wind are intermittent resources. They are not available at all times and cannot be dispatched in the way that other resources such as coal plants or geothermal resources can.
- A utility's system may require significant modifications to accommodate fluctuating output from wind and solar plants.
- A utility may already have sufficient generation resources to meet near-term load requirements, thus resulting in excess generation or the need to divest existing resources.
- Certain renewable resources may not coincide with a utility's peak. DWP is a summer peaking utility - customer demand is the highest during the summer. Individual wind resources, which comprise a large portion of DWP's renewable resource portfolio, may or may not coincide with

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<sup>1</sup> SB 1078

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customer peak, depending on the location of the wind farm and its generation profile.

- Levels of hydro generation may be affected by drought or rain conditions. Wind and solar production similarly vary depending on weather.
- In general, renewable resources are more expensive than traditional resources. Many utilities are currently struggling with the cost implications of these programs. **Exhibit 1** provides a comparison of the cost of traditional technologies and renewable resources based on information prepared by DWP:

**Exhibit 1  
Resource Cost Comparison – Renewables versus Traditional Generation  
Unaudited**

<b>Technology</b>	<b>2010 Energy Mix (percent of total)</b>	<b>2010 Energy Cost Cents/Kilowatt Hour (KWh)</b>
<b>Non-Renewable</b>		
Coal	39	4.4
Natural Gas	26	4.9
Nuclear	10	5.7
Large Hydro	5	2.3
<b>Renewables:</b>		
Small Hydro	6	7.3
Wind	9	9.6
Solar	<1	20.7
Geothermal	<1	9.0
Biomass and Waste	4	5.9

Source: California State Senate Committee Briefing – DWP RPS Status Report 2-1-2011

**California State Regulation**

California's RPS is one of the most ambitious renewable energy standards in the country. **Exhibit 2** provides the RPS requirements in selected other states.

**Exhibit 2  
RPS Requirements**

<b>Utility</b>	<b>2010 RPS Requirement</b>	<b>Final Requirement</b>
Arizona	2 ½ percent	15 percent in 2025
Austin Energy	10 ½ percent	30 percent by 2020
California	20 percent	33 percent by 2020
New Mexico	6 percent	20 percent in 2020
Nevada	12 percent	25 percent in 2025
Salt River Project	5 percent	15 percent in 2025
SMUD	20 percent plus 3 percent demand side management (DSM)	33 percent in 2020 plus 3 percent DSM
Washington	3.0 percent by 2012	15 percent in 2020
Texas	2000 MW by 2009	10,000 MW by 2025

Source: NorthStar Benchmark Survey conducted as part of this audit.



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In 2002, the California Legislature approved SB 1078 requiring investor-owned utilities (IOUs) such as Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) to develop an RPS to provide 20 percent of their energy from renewable resources by 2017. SB 1078 does not apply directly to publicly-owned municipal utilities such as DWP; however, it does require these utilities to develop their own RPS. In 2003, the State Energy Action Plan accelerated the 20 percent deadline to 2010, and in 2006, SB 107 codified the accelerated deadline into law.

In September 2009, the Governor's Executive Order S-21-09 increased the RPS requirement to 33 percent by 2020, and made the requirement apply to all utilities, including publicly-owned municipal utilities. Under the 2009 Executive Order, technologies eligible for the RPS include photovoltaics; solar thermal electric; wind; certain biomass resources; geothermal electric; certain hydroelectric facilities; ocean wave, thermal and tidal energy; fuel cells using renewable fuels; landfill gas; and municipal solid waste conversion.

The California Public Utilities Commission (CPUC) and the California Energy Commission jointly implement the State's RPS program. The CPUC's responsibilities include:

- Determining annual procurement targets and enforcing IOU compliance.
- Reviewing and approving each IOU's renewable energy procurement plan.
- Reviewing IOU contracts for RPS-eligible energy.
- Establishing the standard terms and conditions used by the IOUs in their contracts for eligible renewable energy.
- Calculating market price referents (MPRs) for non-renewable energy that serve as benchmarks for the price of renewable energy.

Established in Public Utilities Code § 399.15(c), the MPR represents the market price of electricity. It may be used as a benchmark to assess the above-market costs of RPS contracts, and can serve to contain the total cost of the RPS program. Public Utilities Code § 399.15(c) requires that the CPUC establish the MPR through a methodology that considers in part:

- The long-term ownership, operating, and fixed-price fuel costs associated with fixed-price electricity from new generating facilities, and
- The value of different products, including baseload, peaking, and as-available generation.

The CPUC adopts the MPR each year for California's RPS solicitations. The CPUC's Energy Division staff compare the price of each RPS contract to the MPR; prices at or below the MPR may be accepted as per se reasonable by the CPUC. RPS contracts priced above the MPR may face a stronger burden of proof in justifying the reasonableness of their contract price. **Exhibit 3** provides

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the MPRs established by the CPUC during the period 2004-2009. MPRs vary based on project/contract start date.

**Exhibit 3  
CPUC Renewable MPRs**

<b>Year Adopted</b>	<b>Baseload MPR (cents/kWh)</b>
2004	6.05
2005	8.18 - 8.33 (for 2006 projects)
2006	8.08 - 8.46 (for 2007 projects)
2007	9.27 - 9.52 (for 2008 projects)
2008	10.04 - 11.48 (for 2009 projects)
2009	8.45 - 10.02 (for 2010 projects)

Source: CPUC website.

Under the requirements of SB 1078, the California Energy Commission (CEC) is responsible for certifying eligible renewable resources and designing and implementing a tracking and verification system for renewable energy output to ensure that the energy is counted only once for the purpose of the RPS and for verifying retail product claims in California or other states. The CEC established the Western Renewable Energy Generation Information System (WREGIS) in response to this requirement. WREGIS is a voluntary, independent registry and tracking system that registers generating units, collects verifiable renewable energy generation data, issues WREGIS certificates, and accounts for transactions involving WREGIS certificates in the geographic region covered by the Western Electricity Coordinating Council (WECC).

In 2006, SB 107 authorized, but did not require, the CPUC to allow the use of unbundled or tradable Renewable Energy Credits (RECs) for RPS compliance. A REC represents a claim over the renewable attributes of one megawatt-hour (MWh) of generation from an eligible renewable resource. RECs are “generated” simultaneous to the energy output of a renewable energy resource. RECs can be sold bundled with the associated energy, or on an unbundled basis, as a stand-alone product. RECs are issued through WREGIS, which certifies that the electricity was generated by an RPS-eligible renewable energy resource and delivered for consumption by California end-use customers in accordance with the definition of delivery implemented by the CEC.

The use of and market for tradable RECs has been the subject of CPUC workshops and industry debate. The legislature authorized the CPUC to allow the use of tradable renewable energy credits in 2006; however, it was not until 2008 that the CPUC issued its first proposed decision. The CPUC subsequently considered various proposals, and on March 11, 2010, the CPUC authorized the use of tradable RECs for IOU RPS compliance. Previously, utilities were

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required to procure exclusively "bundled" renewable contracts, for both energy and RECs together. On May 6, 2010, the CPUC voted to stay the tradable renewable energy credit decision. A proposed modification to the decision was issued August 25, 2010. As of December 2010, alternate decisions were still being considered.

The framework presented in March 2010 would allow the IOUs to buy RECs separately from the associated energy. Allowing these two products to be sold as separate commodities, each commanding a price in the market that more accurately reflects its value, was expected to increase the efficiency of the RPS program. "The essential elements of this framework are intended to support this market well into the future," said CPUC President Michael R. Peevey. "Although the tradable REC market may be modest in the next two or three years, the market rules put in place in this decision will both allow this new market to develop and provide robust rules as the tradable REC market matures."

S-21-09 directs the California Air Resources Board (ARB) to adopt regulations requiring that 33 percent of electricity sold in the State come from renewable energy by 2020. Specifically, S-21-09 orders that the ARB:

1. Adopt a regulation consistent with the 33 percent renewable energy target established in Executive Order S-14-08 by July 31, 2010. In developing the regulation, the ARB may consider different approaches that would achieve the objectives of the Executive Order and may increase the target and accelerate and expand the time frame based on a thorough assessment of such factors as technical feasibility, system reliability, cost, greenhouse gas emissions, environmental protection or other relevant factors.
2. Work with the CPUC and the CEC to ensure that a regulation adopted under authority of AB 32 to encourage the creation and use of renewable energy sources shall build upon the RPS Program and shall regulate all California load serving entities, including investor-owned utilities, publicly-owned utilities, direct access providers and community choice aggregators.

On September 23, 2010, the ARB approved a Renewable Electricity Standard regulation that applies to all entities that deliver electricity, including IOUs and publicly-owned utilities/municipal utilities. The regulation creates a program that is consistent for all electrical entities and is based on a phased-in approach that provides for interim targets for renewable energy of 20 percent for 2012-2014, 24 percent for 2015-2017, 28 percent for 2018-2019, and 33 percent for 2020 and beyond.

**Exhibit 4** provides a summary of key State regulations.

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**Exhibit 4  
Timeline of Key State Regulations**

<b>Date</b>	<b>Regulation</b>
2002	Senate Bill 1078 establishes the RPS program, requiring 20 percent renewable energy by 2017
2003	The 2003 Energy Action Plan I accelerates the 20 percent deadline to 2010
2006	Senate Bill 107 codifies the accelerated deadline into law
2005	Assembly Bill 200 modifies some requirements for electric corporations that serve customers outside of California and have 60,000 or fewer customer accounts in California
2005	The 2005 Energy Action Plan II examines a further goal of 33 percent by 2020
2006	Executive Order S-06-06 (2006) establishes targets to increase the production and use of bio-energy
2006	Assembly Bill 1969 requires electrical corporations to purchase, at a CPUC set price, renewable energy output from public water and wastewater facilities up to 1 MW
2007	Senate Bill 1036 modifies the Supplemental Energy Payments process
2008	AB 3048 makes minor technical changes to clarify code to provide conformity in the Public Utilities Code
2008	Senate Bill 380 amends P.U. Code 399.20 to make the feed-in tariff established by AB 1969 applicable to all eligible renewable generators (previously limited to water and wastewater facilities) and increases the program cap to 500 MW (previously set at 250 MW). A feed-in tariff allows renewable energy generators (including households) to interconnect with the grid, and requires energy suppliers to buy electricity produced from renewable resources at a fixed price, usually over a fixed period of time
2008	Executive Order S-14-08 sets a target of 33 percent renewable energy by 2020
2009	Executive Order S-21-09 directs the California Air Resources Board (ARB) to adopt regulations increasing California's RPS to 33 percent by 2020

Source: CPUC Website.

**Los Angeles City Requirements**

DWP's initial renewable requirements were established in August 2000, with the Water and Power Board of Commissioners' approval of a resolution authorizing DWP to meet 50 percent of projected load growth through a combination of demand-side management, distributed generation, and renewable resources. Under the initial RPS plan, DWP established goals of developing 30 MW of renewables by 2001, 100 MW by 2005 and 150 MW by 2010.

In 2003, the Mayor established a Green Ribbon Commission and the City Council convened a Renewable Energy Summit to further the City's renewable objectives.

In June 2004, in response to evolving state requirements, the City Council adopted an RPS Framework and requested that DWP achieve 20 percent of energy from renewable sources by 2017 and incorporate RPS requirements into all future system planning. On October 15, 2004, the City Council adopted a resolution approving the inclusion of existing DWP hydroelectric generation units greater than 30 MW in size, excluding the Hoover hydroelectric plant, as part of the City's RPS eligible resources.

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In January 2005, the City Council approved a resolution adopting an interim goal of 13 percent renewables by 2010. On March 18, 2005, the Mayor proposed that the City's Green Ribbon Commission consider including a 1 percent RPS set aside for solar photovoltaics.

In June 2005, the City Council approved DWP's initial RPS policy. The policy:

- Included a goal of increasing DWP's supply of electricity from renewable resources until a target of 20 percent is achieved in 2017, with an interim goal of 13 percent by 2010.
- Defined eligible technologies.
- Required an integrated resource planning process that would not compromise service reliability, competitive rates, or environmental leadership.
- Established a competitive bid procurement process using least-cost, best-fit criteria.
- Set forth reporting requirements.

In adopting that policy, the City Council acknowledged ratepayer concerns regarding potential rate increases and recognized the need to ensure that the commodity price of renewable power not be proportionally higher than DWP's current blended commodity energy price of 4.5 cents per hour or require future electric rate increases without full understanding of the implications of such investments. In a motion approved July 2006, the City Council required that the Board of Water and Power Commissioners take steps to ensure that DWP not procure RPS power from any third-party provider whose initial delivery price exceeds 7.0 cents per kilowatt hour without prior Council approval, and prevent DWP from entering into agreements which may result in future electric power rate increases without prior Council approval and a full review of the fiscal and operational implications of each investment.

### **DWP's RPS Program**

DWP's RPS program was initiated in 2005 as the result of the City Council's resolution to achieve 20 percent renewable energy by 2017, and the Mayor's recommendation that the RPS goal be accelerated to 20 percent renewables by 2010. In December 2005, the Board of Water and Power Commissioners recommended that DWP accelerate the goal to 20 percent renewables by 2010. On December 13, 2005, DWP management presented a master plan to meet the RPS goal of 20 percent by 2010.

While these 2005 directives included the possibility of a rate mechanism to recover RPS costs, they did not address the total cost impact of achieving the

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RPS goals.<sup>2</sup> This is not unusual. NorthStar's benchmark survey found that, similar to Los Angeles, total long-term, all inclusive rate forecasts for RPS programs have not been publicly vetted in most jurisdictions. Most utilities surveyed accept the RPS requirements as a legal mandate and strive to implement the RPS requirements as any other legal mandate. There appears to have been very little public discussion by both the utilities and the regulators of the total final costs expected to be recovered from the ratepayers.

As shown in **Exhibit 5**, in response to State and City requirements, DWP and the City developed an RPS policy designed to meet State RPS targets and ensure delivery of renewable energy to the Los Angeles basin. The policy has been updated over time to reflect changes in State regulations. In 2008, DWP amended its RPS policy to address the City's goal of 35 percent renewables by 2020, add additional eligible renewable technologies, allow energy to be firmed and shaped,<sup>3</sup> and provide a methodology for calculating RPS goals during periods of low hydro and wind production, consistent with revisions to CEC guidelines.<sup>4</sup>

**Exhibit 5  
Comparison of State Requirements and DWP's Policy**

Requirement	State	DWP
<b>Renewable Target</b>	20% - 2010 33% - 2020	20% - 2010 35% - 2020
<b>Compliance Reporting</b>	RPS Percent = $\frac{\text{Renewable GWh purchases}}{\text{Total sales to retail customers}}$	Same
<b>Non-Metered Resource</b>	Non-metered generation calculated based on CEC Guidebook "Renewable Portfolio Standard Eligibility" Third Edition	Same
<b>Eligible Technologies</b>	Photovoltaics; solar thermal electric; wind; certain biomass resources; geothermal electric; certain hydroelectric facilities; ocean wave, thermal and tidal energy; fuel cells using renewable fuels; landfill gas; and municipal solid waste conversion, not the direct combustion of municipal solid waste  Small hydro less than 30MW	Same  Some small hydro greater than 30 MW [Note 1]
<b>Certification [Note 2]</b>	CEC-certified only	Must be in WREGIS, primarily CEC-certified
<b>RECs</b>	Unbundled/tradable RECs allowed up to certain limits [Note 3]	Bundled energy and RECs only [Note 4]

<sup>2</sup> According to DWP, costs were discussed in a closed session, but NorthStar is unable to verify this.

<sup>3</sup> An intermittent resource is converted into a firm resource

<sup>4</sup> DWP had previously amended its RPS policy April 2007 to include the 2010 target of 20 percent and establish a phased RPS ownership targets as part of an agreement between DWP and Local 18 of the International Brotherhood of Electrical Workers (IBEW).

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Note 1: DWP's policy allows small hydro facilities (as defined by the State) as well as the Los Angeles Aqueduct hydro power plants. Some of DWP's small hydro facilities are 37.5 MW or 40 MW, which are in excess of State requirements. This policy was approved by the City in Resolution No. 005-265.

Note 2: Both the State and DWP require that purchases be CEC-certified renewable (i.e., resources that have been certified by the CEC as qualifying renewable projects).<sup>5</sup> CEC-certified resource may be more expensive than non-certified renewable, but provide greater assurance that DWP is receiving renewable power. The State requires that the IOUs use only CEC-certified renewables. Currently, DWP is not subject to these State requirements; however, recently introduced legislative bills would have made DWP subject to this requirement. DWP currently complies with this regulation and requires attestations or WREGIS RECs from its renewable generators and renewable power purchases. According to information provided by DWP, the market price differential between CEC-certified renewable and non-certified renewable is approximately \$10/bundled MWh, assuming such resources are available. The supply of non-certified renewable is expected to decrease as an increasing number of resources become certified in order to sell power to the IOUs.

Note 3: The rules approved in the March 2010 decision create a market in which the use of tradable RECs for RPS compliance is initially limited to 25 percent of their annual procurement target through 2011.

Note 4: As a result of findings from a prior audit, DWP does not use unbundled or tradable RECs to satisfy renewable requirements. An audit of DWP's Green Power Program found that DWP had been procuring green tickets from other entities/states to satisfy the demand requirements from the Green Power Program and recommended that in "consideration of the promotion and commitments that have been made to Green Power customers in the Los Angeles area, the Department should re-evaluate the use of green tickets to meet customer demand for new renewable energy and pursue the development of new green power resources that will provide green benefits in the Southern California area." DWP's promotion of the program ("Green Power for a Green LA") implied that the benefits were more directly tied to the Los Angeles Basin. DWP was ordered to discontinue the use of Green Tickets. As a result of this audit, DWP's renewable energy procurements are limited to development and acquisition of physical generation assets and energy purchase contracts, and therefore, DWP will not purchase the REC from a renewable resource without purchasing the associated energy.<sup>6</sup>

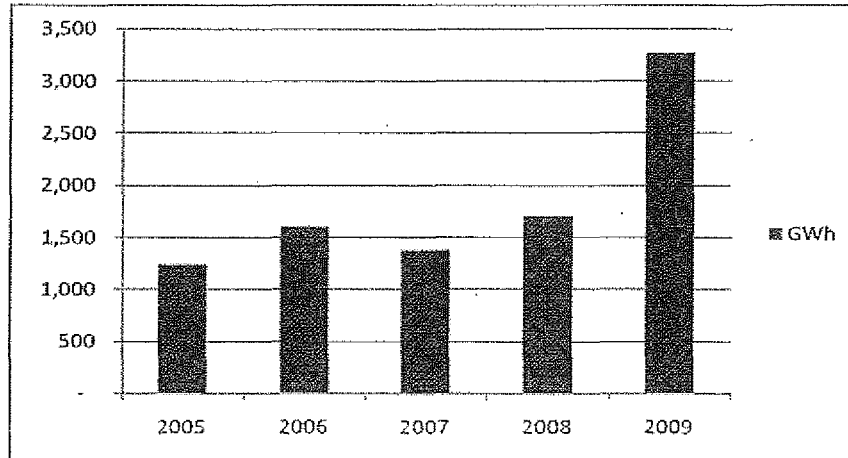
As shown in **Exhibit 6**, DWP has significantly increased its renewable energy since 2005. In 2009, renewable generation accounted for over 3,000 GWh of DWP's retail sales. This amount was projected to increase in 2010 as new renewable projects came on-line and projects that were completed during 2009 were operational for a full year.

<sup>5</sup> For the IOUs, procurement from a renewable facility cannot be counted towards a load serving entity's RPS obligation unless that facility has been certified as RPS-eligible by the CEC.

<sup>6</sup> DWP's REC policy resulted from the Controller's Green Power Audit.

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**Exhibit 6  
CEC Reported Renewable Generation**



From 2000 to 2005, DWP added renewable resources in response to its 2000 IRP and changing regulations. **Exhibit 7** provides the renewable resource included in DWP's portfolio prior to the establishment of the 2005 RPS requirement or the 2004 DWP Request for Proposals.

**Exhibit 7  
Existing RPS Resources Prior to the Establishment of the 2005 RPS Requirement**

Technology	MW	GWh	Percent
Small Hydro	166	629	2.7
Biomass Digester Gas	16	147	0.6
Landfill	2	2	0.0
Wind/Hydro	0	728	0.0
Solar Photovoltaics	21	30	0.1
<b>Total</b>	<b>204</b>	<b>1,536</b>	<b>3.5</b>

Renewable generation increased to 1,603 GWh in 2006. From 2007 to 2009, DWP added landfill gas contracts, completed upgrades to its Castaic pumped storage facility, increased its solar activities, planned a 41 GWh expansion of Pine Tree and was in the negotiation process with an additional 1,460 GWh of generation resulting from a 2008 Southern California Public Power Authority (SCPPA) RFP. **Exhibit 8** provides a timeline of key additions and planned additions.



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**Exhibit 8  
Planned and Actual Renewable Additions**

<b>Date</b>	<b>Event</b>	<b>Renewable Generation Added (GWh)</b>	<b>Commercial Operation Date (COD)</b>
	Existing Renewables	593	
2001	DWP RFP – two contracts signed one project successfully completed.	381	2009
2004	DWP RFP – three purchase power agreements signed.	511	2005, 2006 and 2007
2005	SCPPA RFP – two purchase power agreements signed.	668	2006 and 2009
2006	SCPPA RFP – three purchase power agreements signed.	452	2008, 2010 2011 Proj.
	<b>Assumed renewable generation subtotal</b>	<b>2,614</b>	
2007	DWP RFP – one purchase power agreement signed.	189	
2008-2010	Planned solar rooftop additions.	164	2008-2017
2008	SCPPA RFP - four purchase power agreements negotiated: <ul style="list-style-type: none"> <li>• Windy Point II (approved) and III (not approved)</li> <li>• Linden Wind (approved)</li> <li>• Miller (not approved)</li> <li>• Two wind projects (not approved)</li> </ul>	689 145 316 310	2010
2009	Additional landfill gas contracts added.	638	2009
2009	Castaic small hydro upgrades complete.	15	2009
2010	Planned Pine Tree expansion.	41	2010
	<b>Assumed renewable generation subtotal not including short-term wholesale purchases</b>	<b>5,121</b>	

Note: GWh presented above do not reflect the projected timing of commercial operation for those plants projected to go on-line in 2010.

As of March 2010, using its least-cost, best-fit criteria, DWP had procured or was in negotiations with approximately 4,400 GWh of renewable generation in response to various GWh targets. DWP updates its RPS GWh targets in response to changes in its load forecast to avoid over procuring more costly renewable resources.

In general, renewable resources are more expensive than traditional resources. Based on DWP's 2009 budget for fiscal years 2010-2014, the annual total cost of meeting the RPS penetration targets for 2010 and 2020 (20 and 35 percent, respectively) will increase from \$270 million for fiscal year 2010 to almost \$1 billion for fiscal year 2020.

DWP's renewable energy purchases and generation and associated costs are shown in **Exhibit 9** and **Exhibit 10**. The amount of renewable resources has increased each year as DWP has acquired resources in accordance with its RPS

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targets. As discussed later in this report, DWP has undertaken a number of efforts to minimize the costs of compliance with RPS requirements.

**Exhibit 9  
Overview of Annual Renewable Energy Production and Costs**

	FY04-05	FY05-06	FY06-07	FY07-08	FY08-09	FY09-10
<b>RPS MWh</b>						
Owned	771,609	1,029,622	945,063	628,935	523,538	1,000,993
Purchased	205,784	436,750	679,658	950,427	1,791,330	3,342,404
<b>Total</b>	<b>977,393</b>	<b>1,466,372</b>	<b>1,624,721</b>	<b>1,579,362</b>	<b>2,314,867</b>	<b>4,343,397</b>
<b>RPS Expenditures (\$ Millions)</b>						
Owned	\$41.4	\$44.6	\$56.5	\$56.2	\$63.6	\$100.7
Purchased	\$10.8	\$28.6	\$44.3	\$68.8	\$142.4	\$239.2
<b>Total</b>	<b>\$52.2</b>	<b>\$73.2</b>	<b>\$100.7</b>	<b>\$125.0</b>	<b>\$206.0</b>	<b>\$339.9</b>
<b>RPS \$/MWh</b>						
Owned	\$53.70	\$43.33	\$59.76	\$89.39	\$121.50	\$100.57
Purchased	\$52.47	\$65.55	\$65.12	\$72.41	\$79.47	\$71.57
<b>Avg</b>	<b>\$53.44</b>	<b>\$49.94</b>	<b>\$62.00</b>	<b>\$79.17</b>	<b>\$88.98</b>	<b>\$78.25</b>
<b>RPS Percent of Retail Sales</b>						
Owned	3.3%	4.4%	3.9%	2.6%	2.1%	4.3%
Purchased	0.9%	1.9%	2.8%	3.9%	7.3%	14.3%
<b>Total</b>	<b>4.2%</b>	<b>6.2%</b>	<b>6.6%</b>	<b>6.4%</b>	<b>9.4%</b>	<b>18.6%</b>

There was a significant increase in DWP's purchases of RPS power in FY09/10. The increase reflects the fact that the Windy Point and Milford I wind projects and the Atmos and Shell landfill projects came on-line. There was also a significant increase in short-term purchases.

DWP's owned aqueduct and hydro generation have fixed costs that occur regardless of the amount of hydro production; as a result, the costs per MWh of owned hydro power increase with lower hydro production, and decrease with increased hydro production. DWP's owned generation costs were lowest in FY05-06, the year with the highest hydro production. The low cost reflects an increased availability of hydro, DWP's least expensive renewable resource. The cost per MWh of DWP's owned renewable energy increased in FY07-08, FY 08-09, and FY 09-10. In FY07-08 and FY 08-09 the increase in owned-generation costs was caused by a decrease in hydro production as a result of State drought/low water availability conditions, along with increased environmental water usage restrictions. The increase in owned-generation costs in FY 09-10 reflect the fact that hydro production remained low and the depreciation and O&M expenses associated with the Pine Tree wind project, which came on-line FY 09-10.

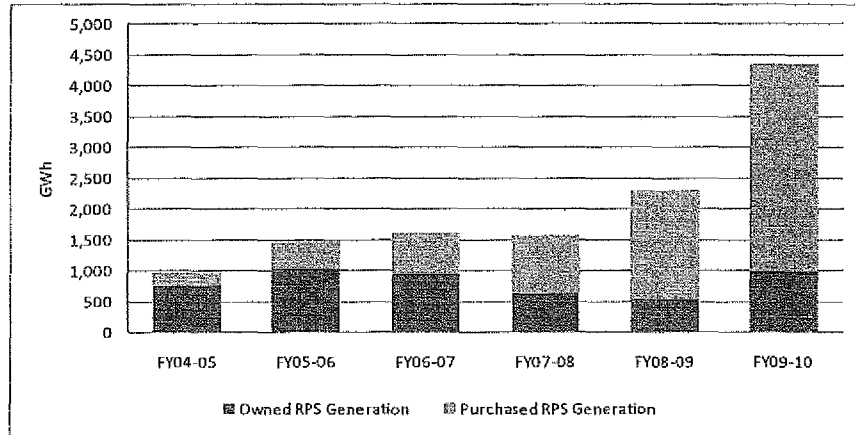
The costs for owned-generation are greater than those of a purchase power agreement (PPA) in the initial years of power generation, while the capital costs are depreciated; however, once the costs have been recovered, if the resource is still able to generate power, the owned-generation costs per MWh drop substantially, and DWP still has access to the generation. A PPA ends upon the

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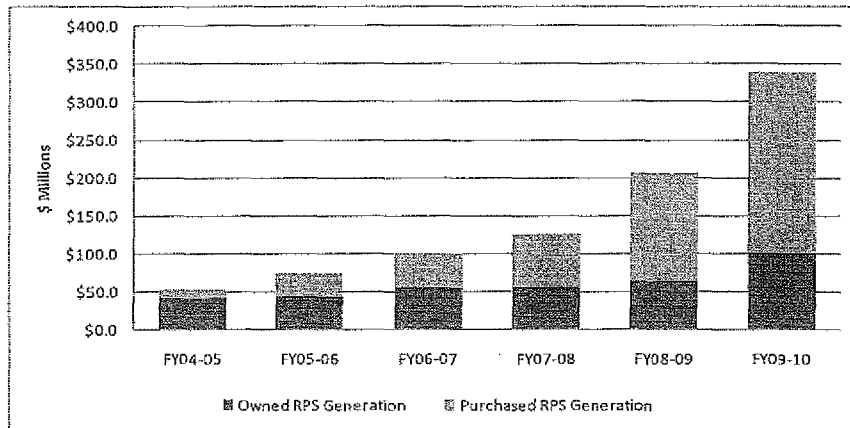
term of the contract. DWP has the option to own in two out of eleven PPAs currently in service and another PPA scheduled for future operation.

**Exhibit 10**  
**Overview of Annual Renewable Energy Production and Costs**

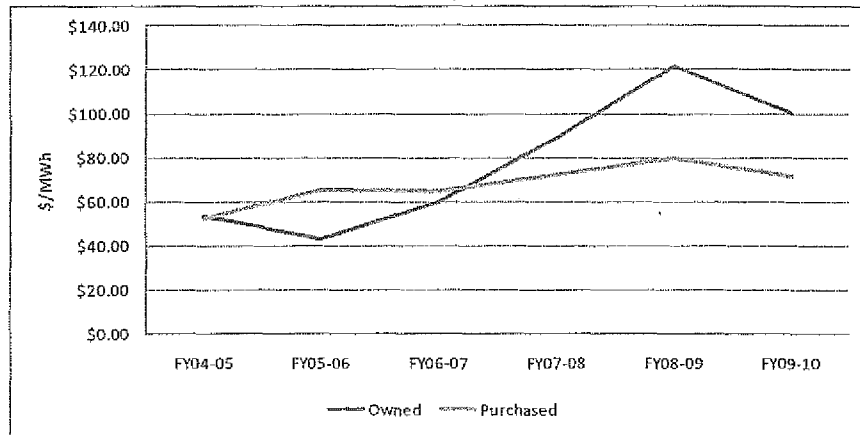
### Annual RPS GWh



### Annual Costs



### Annual \$/MWh



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**Notable Accomplishments**

DWP appropriately calculates compliance with RPS targets (i.e., 20 percent renewable in 2010) based on actual generation as opposed to resource capacity. Prior to April 2010, when DWP's renewable plan changed in response to cost recovery uncertainties, DWP was on track to achieve 20 percent renewables in 2010. DWP had a projected 18 percent of its RPS requirement under contract. The remaining requirements would be met through short-term purchases, additional landfill gas contracts, and wind projects currently in negotiation.

Based on its current 2010 load forecast of 23,368 GWh, DWP would require about 4,560 GWh in renewables to achieve the 20 percent target. As of March 2010, DWP had planned to achieve 4,623 GWh of renewable generation in 2010, and was on target to achieve 20 percent renewables. In response to ECAF funding uncertainties, DWP ceased its aggressive pursuit of the target, and at the completion of our audit fieldwork in August 2010, DWP projected that it was likely to achieve 18 percent renewables in 2010. In November 2010, DWP projected that it may achieve the 20 percent renewable generation target in 2010 based on the higher than expected wind and hydro performance, low load, and additional short-term renewable purchases in the third quarter of 2010 to meet load requirements. Actual results would vary based on end-of-year wind and aqueduct resource output and total sales. **Exhibit 11** provides a comparison of DWP's projected goal achievement.

**Exhibit 11  
Comparison of DWP's Projected 2010 Renewable Energy Percentage**

Source	March 2010 Projection(GWh)	August 2010 Projection (GWh)	November 2010 Projection (GWh)
Wholesale market purchases	671	671	723
Planned additional wholesale market purchases to meet target	253	0	0
Planned projects (Board approved or under negotiation)	100	100	0
Long-Term Power Purchase Agreements	2,169	2,169	1,596
DWP-Owned/Option	1,430	1,430	2,199
<b>Total</b>	<b>4,623</b>	<b>4,370</b>	<b>4,518</b>
Projected Sales	23,368	23,694	22,991
<b>Percent</b>	<b>20%</b>	<b>18%</b>	<b>20%</b>
<b>Result</b>	<b>Target Met</b>	<b>Target Not Met</b>	<b>Target Met</b>

Note 1: Pine Tree Expansion and Linden - GWh projections based on assumed commercial operation date not annual capability.

Note 2: Milford II Expansion - GWh projections based on assumed commercial operation date not annual capability.

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In comparison, a March 2010 update by the CPUC indicated that the California IOUs were likely to achieve 20 percent by 2013. For 2009, the results were 16.8 percent for SCE, 14.4 percent for PG&E and 10.5 percent for SDG&E.

In meeting its RPS requirements, DWP adopted a number of innovative approaches to reduce costs and used least-cost, best-fit criteria for its procurement decisions. The majority of all long-term purchases and owned renewable generation projects resulted from competitive bid processes. DWP adopted contract structures and took advantage of tax incentives to reduce program costs. DWP also maximized the use of its existing transmission network in siting renewable projects.

### **Objectives, Scope and Methodology**

The primary objective of this audit was to determine whether DWP has efficient and effective processes for implementing the City's RPS to increase the use of wind, solar, geothermal, biomass and small hydroelectric power and meet the goal of achieving 20 percent of the City's electricity needs from clean, renewable sources in 2010.

Specific objectives included:

- 1) An assessment of DWP's plans to meet the goals for increasing the percentage of electricity generated from clean, renewable sources.
- 2) An evaluation of how DWP monitors its implementation of the Renewable Energy Portfolio Standard to provide reliable, accurate and timely information for management decisions.
- 3) An assessment of whether DWP's reported status for meeting the established goal for generating 20 percent of the City's electricity needs from clean, renewable sources is accurate and will be met by 2010.
- 4) A determination of how DWP tracks and accounts for changes in electricity needs and the potential impact on the goal established in the Renewable Energy Portfolio Standard.
- 5) An assessment of whether DWP's financing strategy is adequate for implementing the Renewable Energy Portfolio Standard and how it compares to other large urban areas.
- 6) An assessment of DWP's use of performance metrics as it evaluates alternative programs and strategies for achieving the Renewable Energy Portfolio Standard.
- 7) Identification of barriers that may potentially impact the successful implementation of the Renewable Energy Portfolio Standard.

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Our audit was performed in accordance with Generally Accepted Government Auditing Standards (GAGAS). Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Fieldwork was conducted from April through August 2010. In conducting our evaluation of DWP's activities, we reviewed responses to over one hundred data requests and conducted numerous interviews with DWP personnel. NorthStar reviewed and analyzed this information. Verification and audit testing was performed where necessary to validate the information provided by DWP. In November 2010, NorthStar and the Controller's Office met with DWP to review the draft audit point sheets. DWP provided additional information following this meeting that was reviewed by NorthStar and incorporated in the draft report as appropriate. NorthStar also performed a benchmark survey as part of the engagement. Results of the survey are provided in Appendix B. The remainder of this report details our findings, comments, and recommendations.

## AUDIT FINDINGS AND RECOMMENDATIONS

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### Section I: RPS Supply Procurement

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#### Resource Planning

An integrated resource plan (IRP) is a systematic method to determine the optimal way to provide electricity in accordance with environmental, engineering, social, financial and economic considerations. Integrated resource planning uses the same criteria to evaluate both supply and demand options and involves the input of the governance structure, customers, and other stakeholders. An IRP is a multi-year framework and represents the optimal resource combination to meet the utility's core mission of providing low cost, reliable electric power service. Key objectives addressed in DWP's IRPs are:

- Reliable service
- Commitment to environmental leadership
- Self reliance, and
- Maintaining a competitive price.

As required by City directive and DWP policy, DWP adopted a long-term approach to the development of planned renewable projects. Renewables are incorporated into DWP's electric system planning efforts and RPS targets are reflected in DWP's IRPs. Although the respective plans are separate, transmission planning and energy resource planning are performed in a coordinated manner. DWP considers the availability and location of existing renewable resources, the potential for future renewable developments, and its existing transmission network in the development of its IRP. Resource location and availability is factored into DWP's plans for future transmission upgrades, and DWP's 2009 Ten-Year Transmission Assessment includes projects to deliver geothermal, solar, and wind generated energy.

Renewable requirements were first reflected in DWP's 2000 IRP, which assumed that 50 percent of all load growth would be met through demand-side management (DSM), distributed generation (DG), and renewable resources. Under the 2000 Plan, DWP established a goal of developing 30 MW of renewables by 2001, 100 MW by 2005 and 150 MW by 2010. In 2007, DWP developed a new IRP reflecting, among other things, the revised renewable targets of 20 percent renewables by 2010 and 35 percent by 2020. The 2007 IRP:

- Included a 2010 sales forecast of 26,165 GWh which translates to an approximate 5,000 GWh renewable requirement.

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- Planned additions of 1,159 MW of wind and 287 MW of geothermal resources to provide approximately 5,500 additional GWh of energy.. Prior to 2007, DWP had 575 MW of qualifying renewable resources resulting in about 2,040 GWh of renewable energy.
- Proposed transmission upgrades and additional transmission facilities to address aging infrastructure as well as the need for renewable upgrades.
- Proposed a reduction in greenhouse gas emissions to 35 percent below 1990 levels by 2030.
- Planned for the repowering of in-basin generation consistent with system needs and environmental requirements.
- Included a tripling of its investment in energy efficiency and conservation programs from prior years.

DWP has developed approaches for addressing the intermittent nature of certain types of renewable resources and the challenges associated with integrating these resources. Wind power is non-dispatchable, meaning that for economic operation, all of the available output must be taken when it is available. Other resources, such as hydropower and/or load management techniques must be used to match supply with demand. DWP uses a third-party to provide firming and shaping for its Pacific Northwest wind farms, and uses its own hydro facilities for balancing other wind resources. DWP monitors the performance of its wind resources and has modified its assumptions regarding projected wind output based on actual performance. Longer-term, DWP is planning to convert some of its facilities from combined cycle to simple cycle to help address the intermittent nature of certain renewables. A simple cycle combustion turbine (CT) can be powered up or down more quickly than a combined cycle CT; however, a simple cycle CT has a lower thermal efficiency than a combined cycle CT.

On July 21, 2010, DWP presented its 2010 draft Integrated Resource Plan for public comment. DWP faces the difficult task of replacing forty percent of its current electric generation with other generating sources. The Greenhouse Gas Emissions Standard Act (SB 1368) prohibits importing out-of-state energy that exceeds emission standards once the contracts expire. All of DWP's out-of-state coal contracts will expire by 2027. Currently, the coal resources serve approximately 40 percent of annual electricity sales and are financially the least cost generators on the system. Coal generation typically runs 24 hours a day, 365 days per year with a fairly flat output.

The 2010 IRP represented a different approach than that adopted in 2007. Instead of evaluating various scenarios internally and providing one proposed approach for public comment, the 2010 IRP presented a number of different scenarios for public comment. There are two basic drivers to these scenarios.



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The first is the codification of the State's RPS requirement of 33 percent in 2020. The second is the retirement of DWP's coal units.

### Forecasting

RPS compliance is measured as actual sales divided by total renewable generation. A utility's load forecast is a critical input to its RPS process, as sales projections determine the amount of renewables that must be procured. An incorrect load forecast could result in insufficient or excess renewable resources available to comply with the standard.

DWP develops an annual load forecast in the fall of each year, using a methodology that is commonly used by other utilities for sales forecasts and estimating the impacts of energy efficiency and net metered solar rooftops. The forecast horizon is ten years, and is updated at the six-month point using current economic forecasts. DWP uses an econometric forecasting methodology, whereby historical sales are modeled through a set of regression equations that utilize drivers such as population, income, employment, fuel prices, and inflation to explain historical sales. DWP has adopted a back-out methodology for accounting for energy efficiency (EE) and DG programs. Essentially, an estimate of the annual installed EE and DG is added back to the historical sales. A sales forecast is prepared and the EE and DG estimates for each year are subtracted.

DWP revised its RPS GWh targets in response to changes in its load forecast to avoid over procuring more costly renewable resources. The 2007 (most recent) IRP was developed based on existing (2006) load forecasts. Historically, DWP experienced annual sales growth of one percent. DWP's October 2006 load forecast projected sales growth at an average 1.3 percent through 2024. For the key years of 2009 and 2010, DWP's 2006 forecast projected sales of 24,883 GWh and 25,165 GWh, respectively. Actual sales for 2009 were 24,526 GWh - within 1.5 percent of forecast.

DWP's current load forecast shows a decline in sales of four percent for the forecast year and a nearly flat forecast for the following years primarily due to the economy. The economics of the Los Angeles Basin changed substantially in 2007 resulting in Los Angeles not achieving its projected sales growth. The lingering economic downturn resulted in the 2010 IRP forecast for the year 2010 to be 23,555 GWh, a decrease from prior forecasts. In response to changes in the load forecast, DWP appropriately updated its RPS resource requirements.<sup>7</sup>

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<sup>7</sup> DWP's October 2008 load forecast projected sales to retail customers of 24,260 after adjustments for DSM. DWP's January 2009 renewables plan (Master List) was based on this forecast. DWP's April 2009 load forecast projected sales of 23,768 GWh. The renewable plan was updated accordingly. The RPS Plan in effect at the completion of our fieldwork assumes 2010 sales to ultimate customers of 23,398 GWh.

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**DWP's Procurement Strategy**

RPS procurement decisions must consider a variety of factors including load requirements, the cost of the resource, resource reliability, transmission constraints and requirements, and potential integration or system stability issues. DWP's RPS procurement strategy was to secure the majority of its projected renewable load requirements using long-term contracts or DWP-owned facilities, make economic short-term renewable power purchases in the first and third-quarters as appropriate, and to use short-term power purchases to address any renewable generation shortfall towards the end of the year when resources are again available in the wholesale market. Short-term renewable purchases are made during the non-summer months when the resources are available and more economic.

DWP's RPS procurement decisions were made in accordance with a least-cost, best-fit policy. As further described below, the majority of all long-term purchases and owned renewable generation projects resulted from a competitive bid process, and DWP developed contract structures to take advantage of tax benefits and minimize project costs.

- DWP added 1,076 MW of capacity and a projected annual generation of 3,037 GWh through the competitive bid process. NorthStar reviewed the recent RFP selection processes. Viable, low-cost options were explored, and reasonable decision-making criteria employed. The evaluation process considers cost, technical feasibility, resource type and location.
- DWP's competitive bid processes resulted in the procurement of a substantial amount of wind power, one of the least expensive and most mature renewable technologies currently available.
- DWP's RFPs require projects be delivered to and/or interconnected with DWP's transmission system. Use of its transmission network increased the likelihood of project success and availability of resources. Most of the benchmark survey participants cited transmission constraints as a significant barrier to implementing the RPS.
- DWP structured pre-paid purchase power agreements (PPAs) to take advantage of a municipal utility's ability to borrow at favorable rates to purchase power upfront and to capture some of the tax benefits available to taxable entities. DWP's prepayment of a portion of the expected power delivery helps renewable project developers raise construction financing. In return, DWP receives discounts from developers related to their ability to utilize the project's tax attributes and economic stimulus grants. DWP estimates that it has saved \$217 million through its participation in three

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SCPPA pre-paid PPAs, in comparison to traditional immediate ownership of a project.<sup>8</sup>

- DWP took advantage of federal and state renewable project financing incentives to reduce the cost of its Pine Tree Expansion, Pine Tree Solar, and Adelanto Solar projects. Based on current market projections, DWP estimates that use of these incentives will provide a present value savings of about \$28.3 million when compared to a tax-exempt debt issuance.

Competitive Bid Process

DWP issued RFPs in 2001, 2004, 2007 and 2009 for the procurement of renewable resources. DWP also participates in the SCPPA RFP process. SCPPA issued RFPs in 2005, 2006, 2008, 2009 and 2010. RFPs requested proposals from a variety of technologies including biomass, digester and landfill gas, biodiesel, geothermal, wind, small hydro, ocean wave, ocean thermal, tidal current, and various solar technologies. The evaluation process considers cost, technical feasibility, resource type and location. DWP short-listed projects for each resource type and entered into discussions with the shortlisted proposals. If discussion/negotiations with the short-listed proposals fell through, DWP would consider other proposals from the bid list. **Exhibit 12** provides details of the RFP results.

**Exhibit 12  
RFP Results**

RFP	Number of Bids	Number Shortlisted	Projects Selected	Type	Comments
2001	21	2	1	Wind	Ultimately converted to a DWP-developed project.
2004	74	12	3	Landfill and Small Hydro	Projects in-service.
2005 (SCPPA)	24	8	2	Wind	Projects in-service.
2006 (SCPPA)	28	8	3	Wind and Small Hydro	One wind project and small hydro in-service. Other wind project delayed due to cost recovery issues.
2007	62	16	2	Wind Solar	Solar project not approved by City Council. Wind project in-service.
2008 SCPPA			3	Wind	Two wind projects in-service. Other delayed due to cost recovery issues.
2009	32	2			RFP closed early due to cost recovery issues.

Note: Developers may submit more than one project/bid.

<sup>8</sup> DWP's estimated savings are presented in the Board Approval Letters for the pre-paid PPAs and provided the calculation of the savings estimate. NorthStar reviewed and agreed with the calculation, but did not perform a detailed audit of the projected costs.

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DWP's 2009 RFP was a rolling request for proposals (RFP) designed to seek renewable energy proposals on a continuous basis throughout the year. The RFP requested proposals for approximately 1,000 GWh per year of renewable energy resources such as solar, wind, and geothermal power.

The selection process increased in formality and definition as DWP strengthened its process in response to prior RFPs. As part of its 2009 RFP process, DWP used numerical scoring to rank proposals in accordance with the evaluation criteria and weightings listed in the RFP. Proposals were scored in terms of price and technical/commercial factors. DWP developed specific scoring guidelines for use by the evaluators. Proposals were evaluated and ranked by two separate evaluators.

### Project Ownership and Contract Structure

DWP has a mix of renewable project financial structures, from DWP-owned projects to pre-paid power purchase agreements. DWP considers the relative cost of owned vs. purchased RPS projects in its project financial structure decisions, but has a long-term focus on ownership.<sup>9</sup> Ownership may be potentially advantageous in bringing the project online successfully, but may be more expensive than a PPA. Providing an ownership option via a buyout option currently provides the lowest cost financial structure due to the tax grant component available. Combining that structure with an energy prepayment provides favorable RPS project prices.

Certain projects may only be available under specific financial conditions, so there will likely always be a mix. Some developers will only consider PPAs for example, because of their corporate business policy, multi-national corporate parent, and/or tax status. Timing of projects is also a DWP decision point, as tax laws have changed continuously over the last decade which impact project finance, availability of capital and cash flow into the future.

According to DWP, consistent with project priorities identified in the integrated resource planning process, the most advantageous pricing priority for projects after 2011 will generally be:

- PPAs with an ownership option, to allow production tax credits (PTCs) or investment tax credits (ITCs) to be obtained. This is a flexible option that takes advantage of federal incentives, while allowing full DWP ownership in 7-20 years if that is the best financial position. Energy prepayments may be combined with this financial structure as needed to lower the levelized cost of energy (LCOE).
- Direct project ownership/self-development, using Qualified Energy Conservation Bond (QECCB) funding and/or tax grant equivalents if made

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<sup>9</sup> DWP's preference toward project ownership, and associated ownership targets resulted from a grievance filed by the IBEW regarding the potential loss of jobs associated with three of the power purchase agreements.

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available to public utilities. The tax grant equivalent for public utilities would require federal legislation changes, but that option could easily become the preferred scenario, depending on the extent of rule changes.

- PPAs without an ownership option. PPAs may provide low energy pricing, but without the ultimate benefit of project ownership and value.
- Direct project ownership/self-development, using traditional DWP bond funding. This may allow DWP to develop opportunities unique to the power system.

### Pre-paid Purchase Power Agreements

DWP's pre-payment of purchased power costs for its portion of SCCPA's Milford and Windy Point wind projects is an effective use of capital as it received discounts related to federal incentives for the development of renewable energy. As a municipal utility, DWP is not able to take advantage of tax incentives for renewable generation that are available for taxable entities, such as the PTC, the ITC, and the temporary 30 percent grant option included in the American Recovery and Reinvestment Act (ARRA). DWP's pre-paid PPAs are structured to take advantage of a municipal utility's ability to borrow at favorable rates to purchase power upfront and to capture some of the tax benefits available to taxable entities. DWP's prepayment of a portion of the expected power delivery helps renewable project developers raise construction financing. In return, DWP receives discounts from developers related to their ability to utilize the project's tax attributes and economic stimulus grants.

DWP worked with an investment banker to analyze various financial structures for renewable power purchases and/or project development and determined that pre-paid PPAs resulted in lower energy costs. The analysis compared five-year pre-pay with buyout, pre-paid PPA, traditional PPA, and ownership for solar, geothermal, and wind projects, and found that the pre-paid PPA, with or without buyout, resulted in a significantly lower cost of energy. The five-year prepay with buyout option was slightly cheaper for each energy source.

SCPPA issued low-cost tax-exempt bonds to prepay for a guaranteed amount of energy from the Milford Wind Projects-Phase I and II, and the Windy Point project. In return, SCCPA receives from the developer a discount in the cost of wind energy based on the developer's ability to take advantage of economic stimulus cash grants not available to government entities such as DWP. SCPPA has the right to purchase each project at various times, starting as early as six years after commercial operation (Windy Point). To mitigate the risks of prepayment, the agreements were structured such that the projects themselves are used as security for the pre-payment.

As shown in **Exhibit 13**, DWP estimates that it has saved \$217 million through its participation in the SCPPA pre-paid PPAs, in comparison to traditional immediate ownership of a project.

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**Exhibit 13**

**DWP's Estimated PPA Prepayment Savings Compared to Traditional Municipal Ownership**

<b>Project</b>	<b>MW (DWP Share)</b>	<b>Board Approval Date</b>	<b>Average Cost of Energy [Note 1] (\$/MWh)</b>	<b>Prepayment Amount (\$M)</b>	<b>DWP-Calculated Savings (\$M)</b>
Milford Wind Phase I	185	12/2007	\$70.62 to \$74.48	\$270	\$40
Windy Point	262	8/2009	\$65.24 to \$67.82	\$512	\$123
Milford Wind Phase II	102	7/2010	\$91.16 or \$91.01	\$157	\$54

Note 1: Costs shown for a 20 year term for various scenarios presented in the Board Approval Letters, such as an early buy-out option. Costs shown do not include costs options such as ownership at commercial operation date or curtailment of the production tax credit program.

Federal and State Renewable Financing Incentives

DWP has taken advantage of federal and state renewable project financing incentives to reduce the cost of its Pine Tree Expansion, Pine Tree Solar, and Adelanto Solar projects through the Clean Renewable Energy Bond (CREB) program and the Qualified Energy Conservation Bonds (QECB) programs. CREBS and QECBs are tax credit bonds wherein the bondholder receives tax credits. In essence, the Federal government subsidizes the financing costs.

The CREB program is administered by the Internal Revenue Service (IRS) and provides bond authorization for public entities on a competitive basis for renewable electricity projects. The program was initially authorized via the Energy Policy Act of 2005, and in 2008 Congress created a new CREB program as part of its response to the economic crisis. Under the CREB program, lenders issue the tax credit bond and use the proceeds to finance the renewable project. With a conventional bond, the issuer must pay interest to the bondholder; with a CREB, the federal government provides a tax credit to the bondholder in lieu of a portion of the interest the issuer would otherwise pay.

In 2006, DWP applied for, but did not receive CREB allocations for its Pine Tree Wind project. At that time, CREBs were allocated based on the size of the project, with smaller projects receiving the first allocations. On October 23, 2009, DWP received an allocation from the U.S. Treasury for new CREBs of approximately \$29.9 million for the Pine Tree Wind Turbine Expansion Project as amended on January 11, 2010.

Congress created the QECB program in October 2008. QECBs can be used to finance a broad array of conservation projects, including renewable energy projects. In April 2009, the IRS allocated each state a portion of the national QECB volume cap. Within California, the QECBs were allocated to the State itself, counties, municipalities, and Indian tribal governments. Any unused allocation by a large local government was reallocated back to the State.

In early 2010, DWP learned that unused QECB allocations were allocated back to the State for reallocation by the California Debt Limitation Allocation

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Committee (CDLAC). On April 6, 2010, the Board authorized the submission of applications for the reallocation of the QECCBs in an amount not to exceed \$172 million to finance the cost of certain renewable energy projects. In May 2010, DWP was awarded three reallocations for QECCBs from CDLAC totaling \$131.02 million broken down as follows:

- \$35.02 million for the Pine Tree Wind Turbine Expansion Project
- \$48 million for the Adelanto Solar Project
- \$48 million for the Pine Tree Solar Project.

The combined CREBs and QECCBs allocations cover the costs of the Pine Tree Wind Expansion Project and the Adelanto and Pine Tree Solar projects. DWP plans to issue to \$155.5 million of 2010 Series C Bonds as fixed rate, Federally Taxable-Direct Payment Bonds (Build America Bonds<sup>10</sup>), in part as CREBs and in part as QECCBs. Based on current market projections, this will provide a present value savings of about \$28.3 million when compared to a tax-exempt debt issuance.

**Finding No. 1: DWP's renewable strategy changed in response to cost recovery uncertainties. Achievement of future requirements (i.e., 33 percent by 2020) is also at risk. DWP is pursuing a revised ECAF mechanism but has not explored cost saving initiatives specifically targeted at funding additional renewables.**

In response to the uncertainty of ECAF funding, in April 2010 DWP ceased spending on new renewables for 2010 compliance, citing the flexible compliance provision of its policy. The flexible compliance provision allows the Board to consider adjusting the RPS policy in the event that RPG goals cannot be achieved due to limitations in the above market subsidies, surcharge or the availability of renewables that meet the IRP requirement.

DWP suspended short-term wholesale procurement of renewable energy and additional landfill gas procurements, and made approval of renewable projects subject to identification of a clear funding source. Three long-term contracts under development or negotiation were directly affected by the change: Milford 2 (with an initial COD of March 2010 was delayed until 2011 - projected 2010 RPS contribution 0.5-0.6 of the 20.0 percent (annual contribution 0.8-0.9 percent)), Windy Point expansion (0.5 percent annual contribution), and Miller (2.0 percent

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<sup>10</sup> Recent changes in the Tax Credit Program include providing municipalities and cooperatives the option of issuing QECCBs and CREBs as tax credit bonds or as taxable Build America Bonds (BABs). The investor or purchaser of tax credit bonds receives an income tax credit in an amount equal to 70 percent of the tax credit rate determined by the U.S. Treasury. The issuer of BABs receives cash subsidy payments from the U.S. Treasury equal to 70 percent of the lesser of (a) the tax credit rate determined by the U.S. Treasury or (b) 70 percent of the bond's coupon rate.

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annual contribution). **Exhibit 14** provides a comparison of DWP's plan in place before the revised policy decision and the effect of the policy decision.

At the completion of our audit fieldwork in August 2010, DWP projected that it was likely to achieve 18 percent renewables in 2010. In November 2010, DWP projected that it may achieve the 20 percent renewable generation target in 2010 based on the higher than expected wind and hydro performance, low load, and additional short-term renewable purchases in the third quarter of 2010 to meet load requirements. Actual results will vary based on end-of-year wind and aqueduct resource output and total sales. As a result of the timing of the reconciliation process, final, audited RPS results for 2010 will not be available until mid- to late-2011.

**Exhibit 14  
Likelihood of Compliance Comparison – At March 2010**

<b>Energy Source</b>	<b>2010 GWH Projection Pre-Policy Change [Note 1]</b>	<b>Impact of Policy Change</b>	<b>2010 GWH Projection Post Policy Change [Note 2]</b>
Wholesale market purchases	671		671
Planned additional wholesale market purchases to meet target [Note 3]	253	Eliminated	
Planned projects (Board approved or under negotiation)	100	Delayed	
Long-Term Power Purchase Agreements	2,169		2,169
DWP-Owned/Option	1,430		1,430
<b>Total</b>	<b>4,623</b>		<b>4,270</b>
Projected Sales	23,368		23,368
<b>Percent</b>	<b>20%</b>		<b>18%</b>
<b>Result</b>	<b>Target Met</b>		<b>Target Not Met</b>

Note 1: Based on March 2010 report.

Note 2: Using March 2010 report and subtracting items deferred.

Note 3: Reasonable assumption given historical practices.

Presently there is no assurance that the 20 percent (if achieved) will be sustained even through 2011. Absent a renewed pursuit of RPS goals, renewable production will decline in future years as current contracts expire. For example, DWP's Powerex agreement is the first contract to expire in December 2011. The Powerex contract accounts for about 1.8 to 1.9 percent of the 20 percent target. **Exhibit 15** shows the change in RPS projections between the 2009 and 2010 budget forecasts.



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**Exhibit 15  
RPS Achievement Comparison - 2009 and 2010 Budgets**

Year	2009 Budget			2010 Budget [Note 1]			State/City Requirement (Percent)
	Net Sales	Renewable GWh	Percent RPS	Net Sales	Renewable GWh	Percent RPS	
2009	24,012	2,743	11.4				
2010	23,792	5,245	22.0	23,438	4,557	19.4	20/20
2011	23,822	5,203	21.8	23,501	4,001	17.0	
2012	23,872	5,166	21.6	23,730	3,599	15.2	
2013	23,932	5,386	22.5	23,925	3,624	15.1	
2014	24,140	6,245	25.9	24,273	3,363	13.9	
2015	24,158	7,062	29.2	24,423	2,916	11.9	
2016	24,288	7,633	31.4	24,666	2,953	12.0	
2017	24,606	7,802	31.7	24,933	2,967	11.9	
2018	25,028	8,287	33.1	25,390	2,967	11.7	
2019	25,443	8,907	35.0	25,755	2,967	11.5	
2020	25,867	9,214	35.6	26,182	2,967	11.3	33/35

Note 1: The 2010 budget reflects the reduction in renewables spending.

**RECOMMENDATIONS:**

**DWP and the City should:**

1. Develop an approach to meeting future RPS targets (i.e., 33 percent by 2020) that complies with applicable regulations and addresses long-term cost recovery issues, in order to prevent deterioration in RPS performance relative to requirements. In developing its approach, DWP and the City should:
  - a. Establish specific RPS goals for 2020 to ensure certainty in planning and ensure intermediate RPS goals align with current legislative requirements.
  - b. Evaluate the use and relative economic advantage of tradable RECs and non-certified renewables, to the extent allowed by regulation, as a means of complying with City requirements at a lower cost.
  - c. Determine whether renewable project ownership targets are in the long-term best interest of the City and DWP ratepayers.

**DWP should:**

2. Establish resource cost benchmarks to be included in resource planning decisions.

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**Section II: Financial Planning and Reporting**

From a financial management perspective, DWP treats the Power System as a whole. RPS projects are considered part of DWP's resource portfolio. Budgets and financial plans are developed on an aggregate basis and not for the RPS as a separate program. The Power System organization is responsible for meeting the RPS goals, as well as DWP's overall power supply. The Financial Services Organization (FSO) is responsible for budget development.

FSO prepares a forecast of RPS energy costs on a project basis in its annual development of the Power System Fuel and Purchase Power Budget, and in support of DWP's quarterly ECAF Board Approval Letters. (The ECAF Ordinance requires Board approval of estimated expenditures to be included in the ECAF calculation.) At the beginning of each annual budget development process, the Power System provides input data to FSO as summarized in **Exhibit 16**.

**Exhibit 16  
RPS Project Input Data Provided to FSO by Power System  
for the Development of the Fuel and Purchased Power Budget**

Data	Comments
Project Name	
Wheeling and Integration Fee	Currently updated annually as DWP has short term contracts for transportation.
COD	
Term Years	
Project GWH	Wind projects GWh de-rated by 10%
Initial Cost (\$/MWh)	For purchase power agreements this is the initial cost in the agreement. For Pine Tree (DWP-owned) the cost is calculated based on (interest payment + depreciation)/total generation
Annual Escalation Rate	Applied to the initial cost rate

FSO verifies and fine tunes the RPS project inputs to the Fuel and Purchased Power forecast using hourly data available from an Energy Control Center (ECC) database, invoices and the general ledger. As a result of FSO's review of actual wind energy delivery on the ECC server, FSO de-rated the developer projected wind delivery amounts by 10 percent to more closely reflect actual production values. FSO's review of costs has resulted in adjustments to the project cost data provided by the Power System. At this time there is limited actual data as many projects just recently began operation.

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**Finding No. 2:** DWP did not develop a well-defined financial plan in support of its operational plans to achieve its RPS goals. The 2007 IRP and financial plans were not adequately integrated and DWP did not develop a comprehensive financial plan for the RPS program.

The Power System organization is responsible for meeting the RPS goals; FSO is responsible for budget development. No single DWP organization has the responsibility for developing an overall RPS program plan which includes the determination of the overall cost and the adequacy of available resources to pay for the program. The Power System prepares a comprehensive Master List of in-service and planned RPS energy sources which provides a forecast of its RPS goal achievement, but does not have a corresponding single, comprehensive renewable energy program budget and financial plan.

DWP's accounting system classifies costs by type of expense, rather than by program. RPS costs are included in four separate areas of DWP's ten-year budget as shown in Exhibit 17.

**Exhibit 17  
RPS Costs included in DWP Budget**

Budget Area	Types of RPS Costs
1) O&M - Purchased Power	RPS costs are included in the total energy purchase cost amount
2) O&M - RPS	DWP Hydro O&M Wind O&M Utility Owned Solar O&M RPS Resource Development Legal Services apportioned to RPS
3) O&M – Public Benefits	Solar Incentive Costs (funded by the Public Benefits program)
4) Capital - RPS	RPS Scenario Planning Resource Development Utility Owned-Plant Additions and Betterments Transmission Projects Utility-Owned Generating Utility Owned Solar Program

DWP did not develop a financial plan to support its 2007 Integrated Resource Plan (IRP). The 2007 IRP served as the planning document for RPS implementation and outlines DWP's plans to achieve the 20 percent renewable goal in 2010. The 2007 IRP did not present the overall cost impact of meeting the RPS goals. Activities included in the IRP were incorporated in subsequent budgets (i.e., FY 08/09 and FY09/10) but a comprehensive financial plan tied to the IRP does not exist.

While transmission and resource plans are developed in a coordinated manner, the costs of transmission upgrades necessary to implement the RPS goals were

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not included in the draft 2010 IRP. According to DWP, transmission costs will be reflected in the final 2010 IRP.<sup>11</sup>

DWP has recently begun to improve the linkage between its RPS plans and its financial plans. In late 2009, the Financial Services Organization (FSO) and Power System began to have weekly meetings to better coordinate budget and operations. These meetings were suspended when DWP did not receive its requested ECAF increase. In addition, DWP plans to develop a more detailed rate analysis and a financial plan to support the 2010 IRP, once it has gathered public input on the IRP and identified a long-term resource strategy.

**Finding No. 3: As DWP does not separately report overall RPS program costs, it has not adequately communicated the overall, aggregate cost of meeting RPS requirements.**

DWP currently has an established process to track and report its RPS power supply plans and goal achievement; however, it lacks a corresponding process to report the budgeted and actual costs or achieving these RPS goals.

DWP has an established process to keep senior management and the Board apprised of its RPS performance and the actual and planned renewable resources to achieve its RPS goals. DWP's Power System Planning and Development (Power System) organization prepares monthly reports which present the status of the overall RPS program, and detailed progress updates for the specific renewable programs including the Solar, Geothermal, Biogas/Biomass, and Wind Power. In addition, the Power System presents RPS updates to the Board twice monthly: the first monthly presentation is generally a detailed progress report on a specific renewable project, and; the second monthly presentation focuses on actual and projected RPS program performance, with an overview of on-going projects.

The Power System's monthly RPS reports to DWP management and the Board show DWP's progress in achieving its RPS generation goals, but not the associated costs. DWP's "Master List" is the primary document used to convey information about DWP's plans to achieve its RPS goals. It is a list of current and projected renewable resources which contains key data, such as projected GWH and contribution to the RPS goal; however it does not contain cost data, either on a \$/MWH or projected annual cost basis. The Power System also tracks and reports the actual percentage of renewable generation on a monthly basis and projects the RPS generation and purchases for future months; however, the costs associated with the RPS generation is not tracked or reported. Costs of purchased power agreements are included in the Board approval packages. Estimated RPS revenue requirements and other cost projections have been provided periodically, such as the 2006 BWG Revenue Requirements Study, but are not provided routinely.

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<sup>11</sup> Due to the timing of the release of the IRP, NorthStar has not determined whether these costs are included.

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The RPS cost information previously shown in Exhibits 9 and 10 was compiled specifically for the audit. DWP does not routinely report renewable program costs in this manner. The determination of the annual costs of the RPS program required the compilation of data from various sources, including the ECC database and the review of invoices to determine the cost breakdown by projects when necessary. The ECC database is an operational database used for balancing authority purposes, it is not, nor should it be, a controlled cost accounting record system.

While DWP must include its renewable resources as an integrated part of its energy supply from an operational and planning perspective, this does not preclude it from performing focused management, budget, and cost reporting for the RPS program. Separate budget and cost reporting of the RPS program would benefit DWP and the City. Without analyzing the total cost of the renewable energy program, DWP is unable to truly determine, and thus communicate the overall costs of meeting the RPS goals.

**Finding No. 4: DWP and its Board approved power purchase contracts without adequately assessing the impact on the ECAF and customer rates.**

In 2006, the City Council requested that DWP provide an ECAF impact assessment when presenting renewable energy projects to the Board; DWP does not comply with this request. The September 2006 Mayoral Approval Letter unfreezing the ECAF requests that DWP provide an ECAF Impact Statement to the Board and/or Council when presenting renewable energy projects and/or contracts, as well as other funding requests. Until the fall of 2009, the DWP Board Approval Letters for Power Purchase Agreements simply describe the funding source as: "Funding is budgeted in Power Revenue Fund's Fuel and Purchased Power Budget." There is no discussion regarding the funding impact on the projected ECAF over/under-collection.

In 2009, the Board took steps to require an additional financial assessment for large contracts; however, this still does not address the ECAF impact as requested by the City Council. In September 2009, the Board of Water and Power Commissioners adopted a Fiscal Review Policy which requires that the Financial Officer review and provide comments on any agreement that could reasonably be expected to result in expenditures, loss, or other negative financial impact of \$5 million or more.

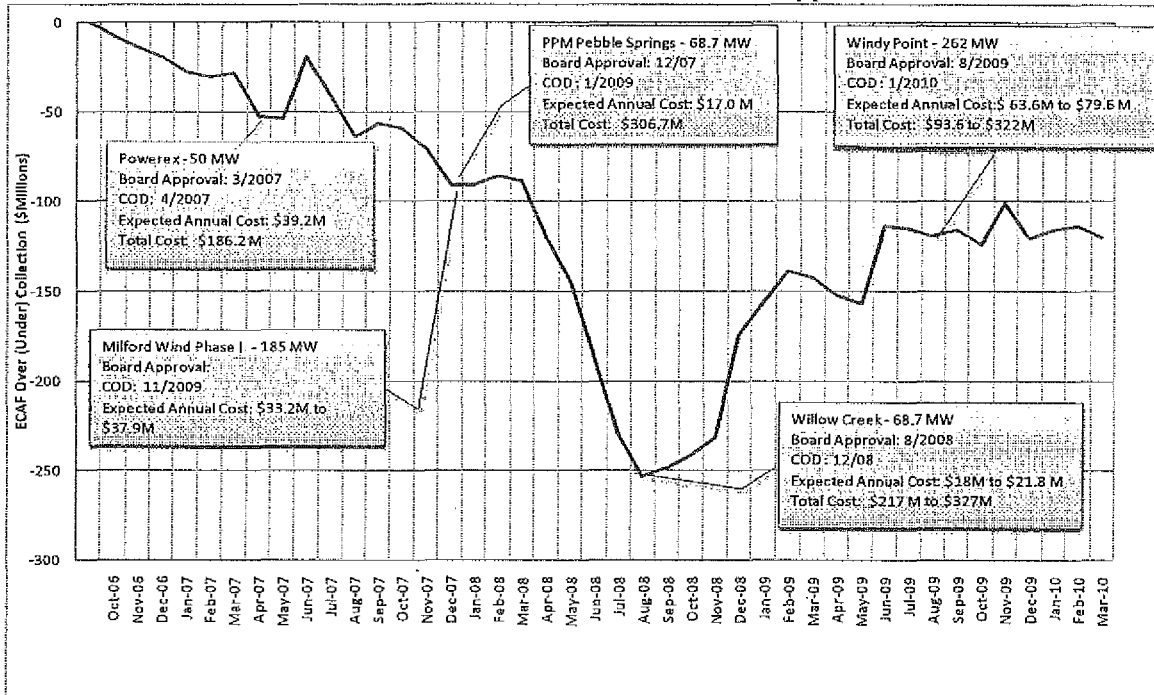
In accordance with the 2009 Fiscal Review Policy, FSO reviews and validates funds for the Board Packages. The FSO Review and Analysis for Contracts over \$5 million specifies the line item in the budget where the contract costs are included, and compares the cost of the proposed contract to the amount budgeted, but does not provide any analysis of the impact on the ECAF balance. The June 23, 2010, FSO Review and Analysis of the Milford II Wind Corridor

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Phase agreement state that “Once the Board approves the contract, then the funds will be provided by Generation...and paid for by ECAF funds.”

Without an analysis showing the projected impact of a proposed project/contract costs on the ECAF balance, the Board does not have the requisite information regarding the impact on DWP finances to make an informed decision. As shown in **Exhibit 18**, the Board approved renewable energy PPAs as the ECAF under-collection continued.

**Exhibit 18  
ECAF Under-Collection and Board PPA Approvals**



The Board reviews the forecast ECAF balance (over or under-collection) in its review of the quarterly ECAF rate increase package. This review addresses changes in the balance from all fuel and purchased power expenditures projected over the next twelve months. It does not provide a look beyond the upcoming twelve months or address the incremental rate impact of individual projects or the RPS as a whole.

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**RECOMMENDATIONS:**

**DWP should:**

- 3. Continue recent efforts to improve the link between the RPS plan and the financial plan to support the execution of the financial plan.**
- 4. Develop an integrated financial planning process linking the RPS and the IRP planning process with traditional financial planning requirements to ensure short and long-term solvency of the RPS programs.**
- 5. Review the cost of its renewable energy program on a routine basis, and compare actual costs to budget to take steps to address significant variances.**
- 6. Manage its efforts to achieve the RPS goals as a comprehensive program and assign an RPS program manager with responsibility for renewable energy RPS goal achievement and associated costs.**
- 7. Assess the financial impact of funding its renewable energy projects, including the projected impact on the ECAF balance or other rate mechanism, as part of its renewable project development and approval process.**
- 8. Include an ECAF or other rate mechanism impact analysis in Board packages for approval of projects over \$5 million.**

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**Section III: Cost Recovery**

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DWP's renewable energy program is initially paid for using a variety of mechanisms, but all costs are ultimately recovered through the ECAF:

- DWP's long and short-term purchased power costs, owned-generation O&M, and capital costs are part of its Power Revenue Fund. DWP issues Power Revenue Bonds to cover the cost of its capital projects.
- Prepaid SCCPA purchased power agreements (PPAs) are financed through SCCPA's issuance of tax-exempt bonds. DWP pays SCCPA a pro-rated share of the bond debt services and expenses paid by SCCPA for the prepayment bonds, based on DWP's project output entitlement shares.
- Renewable projects which receive federal renewable energy incentives in the form of Clean Renewable Energy Bond (CREB) or Qualified Energy Conservation Bond (QECB) allocations are financed through issuance of Build America Bonds.

The ECAF is designed to recover fluctuating energy costs such as fuel and energy purchases, but is also used to recover other costs:

- Fuel procurement expense
- Purchased power cost
- Renewable energy procurement and development
- Demand Side Management (DSM) program expense
- DSM revenue loss recovery
- Transmission expense
- City Transfer (8 percent).

As a result of electric utility industry restructuring, in 1998 the ECAF was frozen at 1997 levels. In 2006, the Board of Water and Power Commissioners adopted a power rate action that allowed DWP to unfreeze the ECAF. Although the ECAF was unfrozen, changes to the rate were capped at 0.1 cents per kWh per quarter, or a total of 0.4 cents per kWh per year. There has been a consistent under-collection in the ECAF since it was unfrozen in October 2006.

DWP first requested an increase to the ECAF cap in August 2009; however, the City Council did not approve this request. In response to DWP's request, in September 2009, at the City Council's direction, the Chief Administrative Officer (CAO) and the Chief Legislative Analyst (CLA) engaged PA Consulting Group (PA) to perform a review of DWP's ECAF proposal. PA analyzed the Department's five-year financial plan, including the 20 percent RPS target, to determine the level of ECAF increase required to maintain the Department's financial integrity and AA bond rating. PA recommended an increase in the ECAF cap.



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In March 2010, DWP presented and the Board approved a 0.8 cents per kWh increase in the quarterly ECAF cap; however, the Los Angeles City Council rejected this increase. DWP then proposed alternative increases to the ECAF. Ultimately, the City Council approved a one time 0.6 cents per kWh increase, effective July 1, 2010.

**Finding No. 5: DWP did not develop an appropriate plan to address the long-term recovery of costs associated with its renewable energy program, given the cap on ECAF rate increases.**

During the initial development of the RPS program, DWP and the City Council were aware of the higher costs associated with renewable energy. In July 2004, the City of Los Angeles Green Ribbon Commission issued a briefing document which showed increased customer rates associated with the RPS. DWP considered the implementation of a renewable surcharge at various times in the early stages of the RPS program:

- The July 2004 Green Ribbon Commission briefing document proposed the establishment of a renewable surcharge to recover renewable costs that exceed DWP's generation costs.
- DWP's initial RPS policy, issued in May 2005, anticipated the potential establishment of a "Renewable Resources Surcharge", if deemed required, to recover the additional costs of renewable resources to meet the RPS goals beginning on July 1, 2007. Per the policy, DWP would not make any major financial commitment to procure/acquire renewable resources prior to the establishment of any such required surcharge to mitigate any potential adverse financial impact on the City transfer.
- The 2007 IRP states that "LADWP will consider mechanisms to recover the costs incurred to support the Renewable Portfolio Standard requirements." However, there is no evidence that DWP considered mechanisms other than the ECAF.

Although DWP anticipated the potential need for a renewable resources surcharge, it elected to include RPS costs for recovery in its existing, frozen ECAF and did not establish a separate surcharge which would have increased the transparency of RPS program costs.

DWP's RPS cost recovery plan was simply to obtain cost recovery through the ECAF. As demonstrated by DWP's suspension of RPS activities when it did not receive adequate ECAF rate increases, this was not an effective long-term RPS cost recovery strategy given the cap on the ECAF. On April 20, 2010, the Assistant General Manager of DWP's Power System declared that the 20 percent RPS goals by 2010 could not be achieved: "According to the Financial

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Services Organization, the recent proposal to modify the cap on the ECAF eliminated LADWP's ability to finance any new RPS projects. All projects associated with achieving and maintaining the 20 percent RPS goal would need to be suspended until a clear funding mechanism is identified. That funding source has not been identified.....” DWP ceased spending on new renewables for 2010 compliance and, as a result, projected that it may not achieve the 20 percent target for 2010. The percent of renewables will decline in subsequent years as existing contracts expire if a more realistic long-term approach to cost recovery is not developed.

As part of its benchmark survey, NorthStar requested information regarding other utilities' RPS cost recovery mechanisms. Exhibit 19 below provides information on the various cost recovery mechanisms used by NorthStar's benchmark participants. While several utilities use a mechanism similar to DWP's ECAF for the recovery of costs associated with renewable purchased power agreements, some utilities have implemented renewables surcharges for the above market costs, and capital costs are typically recovered through base rates.

**Exhibit 19  
Benchmark Survey Result Summary – Cost Recovery Mechanisms**

<b>Utility</b>	<b>Cost Recovery Method</b>
Public Service of New Mexico	Rate base
Salt River Project	Capital included in rate base. Renewable purchased power costs are included in the fuel and purchased power adjustment mechanism.
Tucson Electric Power	Capital included in rate base. For purchased power, the portion that is market based is included in the fuel and purchased power adjustment mechanism. The over-market portion is in a renewable energy surcharge.
Seattle City Light	Embedded in the rates. Council adjusts rates as necessary.
SCE	Energy resource recovery account recovers the costs of purchased power in the generation component of the bill.
Sacramento	Embedded in rates. Board adjusts rates as necessary.
Nevada Power/Sierra Pacific Resources	Capital included in rate base. Purchased power costs are included in the fuel and purchased power adjustment mechanism. A portion of the costs are included in a renewables surcharge
PacifiCorp	CA – Energy cost adjustment for purchased power OR – 1.2 ¢/kWh surcharge WA – embedded in rates UT - optional
Arizona Public Service	Capital included in rate base. For purchased power, the portion that is market based is included in the fuel and purchased power adjustment mechanism. The over-market portion is in a renewable energy surcharge.

Source: NorthStar Benchmark Survey.

**Finding No. 6: As currently structured, the ECAF does not provide for transparency of RPS costs.**

The current structure of the ECAF and the manner in which costs are recorded precludes easy identification and isolation of the RPS costs. Although DWP

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identifies forecast RPS costs separately in the quarterly ECAF rate increase package, it does not separately identify RPS costs in its ECAF accounting.

Actual costs recorded in the ECAF account include.

- Fuel Cost
- Purchased Power
- Renewable Portfolio Standard (RPS) O&M
- RPS Depreciation
- Demand Side Management
- ECA Bad Debt and Settlements
- Revenue from Steam Supply & Green Power
- DSM Revenue Loss

It is currently not possible to isolate the actual RPS costs in the ECAF account as the Purchased Power line is a single line item from the General Ledger which includes both renewable and non-renewable power. Without the ability to isolate the actual RPS costs included in ECAF, it is impossible to determine the extent to which renewable power has contributed to ECAF under-collection.

RPS expenses included in the ECAF include all charges associated with renewable resource energy, capacity, RPS-related prepayment expenses, operation and maintenance, depreciation, and interest expenses for generation and transmission. **Exhibit 20** shows a detailed breakdown of RPS costs and their ECAF line items.

**Exhibit 20  
RPS Costs Included in ECAF**

RPS Element	Types of Costs	ECAF Line Item
Purchased Power		
SCPPA Purchased Power Agreements (PPAs)	Capitalized Interest CWIP Debt Service Environmental Attributes Generation Imbalance Charge Interest Received Power Costs Property Taxes & Insurance Travel Expense Purchased Power SCPPA A&G Transmission Charge Wind Integration Charge Working Capital	Purchased Power
DWP PPAs	Energy and Delivery Costs	Purchased Power
Owned Generation		
DWP-Owned Generation	Capital Cost O&M Interest	RPS Depreciation RPS O&M

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RPS Element	Types of Costs	ECAF Line Item
<b>Transmission Upgrades</b>		
SCPPA – Southern Transmission System (STS) Upgrade	Capitalized Interest CWIP Debt Service	Purchased Power
<b>Other RPS Expenses</b>		
DWP – Solar Incentives	Customer Solar Incentive Payments	Funded by Public Benefits Program
RPS Project Development		RPS O&M
Legal Support		RPS O&M

Note: NorthStar did not audit the ECAF, and did not review details of journal entries ECAF line items.

The PA report recommended reconstituting the ECAF to focus specifically on volatile fuel and purchased power components only, and removing RPS, energy efficiency, City transfer elements, and all other components from the ECAF. DWP plans to restructure the ECAF to include a separate Renewable Energy Factor for renewable energy and DSM costs. Under this proposal, the ECAF will be split into two components: the traditional ECAF elements and a separate factor for RPS and DSM costs.

DWP's proposed ECAF structure is shown in Exhibit 21. To facilitate this change, in November 2009, DWP began to record RPS costs to a separate work order to enable RPS costs to be separately identified in the accounting system. While the change in structure will improve RPS cost transparency, unless the renewable energy factor is unfrozen it will not adequately address long-term cost recovery.

**Exhibit 21  
DWP's Proposed ECAF Structure**

	Renewable Energy Factor	Traditional ECAF
RPS Generation	✓	
RPS Transmission	✓	
DSM Revenue Lost Recovery	✓	
DSM Spending	✓	
City Surcharge	✓	
Natural Gas		✓
Coal		✓
Nuclear		✓
Economy Purchase		✓
Non-RPA Transmission Expense		✓
Other ECAF Expenses		✓
City Surcharge		✓

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RECOMMENDATIONS:

DWP and the City should:

9. Develop a cost recovery mechanism that addresses RPS costs on both a short-term and long-term basis and provides complete transparency of the costs of achieving its RPS goals.

DWP should:

10. Ensure it has the accounting structures in place to isolate and capture all identifiable and incremental RPS costs for recovery. All major categories of costs should be captured.

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**APPENDIX A  
Ranking of Recommendations**

Section Number	Summary Description of Findings	Ranking Code	Recommendations
I.	1. DWP's renewable strategy changed in response to cost recovery uncertainties. Achievement of future requirements (i.e., 33 percent by 2020) is also at risk. DWP is pursuing a revised ECAF mechanism but has not explored cost saving initiatives specifically targeted at funding additional renewables.	<p align="center">U</p> <p align="center">U</p> <p align="center">N</p> <p align="center">N</p> <p align="center">N</p>	<p>DWP and the City should:</p> <p>1. Develop an approach to meeting future RPS targets (i.e., 33 percent by 2020) that complies with applicable regulations and addresses long-term cost recovery issues, in order to prevent deterioration in RPS performance relative to requirements. In developing its approach DWP and the City should:</p> <p>a) Establish specific RPS goals for 2020 to ensure certainty in planning and ensure intermediate RPS goals align with current legislative requirements.</p> <p>b) Evaluate the use and relative economic advantage of tradable RECs and non-certified renewables, to the extent allowed by regulation, as a means of complying with City requirements at a lower cost.</p> <p>c) Determine whether renewable project ownership targets are in the long-term best interest of the City and DWP ratepayers.</p> <p>DWP should:</p> <p>2. Establish resource cost benchmarks to be included in resource planning decisions.</p>

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Section Number	Summary Description of Findings	Ranking Code	Recommendations
<b>II</b>	2. DWP did not develop a well-defined financial plan in support of its operational plans to achieve its RPS goals. The 2007 IRP and financial plans were not adequately integrated and DWP did not develop a comprehensive financial plan for the RPS program.	<b>U</b>	DWP should:  3. Continue recent efforts to improve the link between the RPS plan and the financial plan to support the execution of the financial plan.
	3. As DWP does not separately report overall RPS program costs, it has not adequately communicated the overall, aggregate cost of meeting RPS requirements	<b>U</b>	4. Develop an integrated financial planning process linking the RPS and the IRP planning process with traditional financial planning requirements to ensure short and long-term solvency of the RPS programs.
	4. DWP and its Board approved power purchase contracts without adequately assessing the impact on the ECAF and customer rates.	<b>N</b>	5. Review the cost of its renewable energy program on a routine basis, and compare actual costs to budget to take steps to address significant variances.
		<b>N</b>	6. Manage its efforts to achieve the RPS goals as a comprehensive program and assign an RPS program manager with responsibility for renewable energy RPS goal achievement and associated costs.
		<b>U</b>	7. Assess the financial impact of funding its renewable energy projects, including the projected impact on the ECAF balance or other rate mechanism, as part of its renewable project development and approval process.
		<b>N</b>	8. Include an ECAF or other rate mechanism impact analysis in Board packages for approval of projects over \$5 million.
<b>III</b>	5. DWP did not develop an appropriate plan to address the long-term recovery of costs associated with its renewable energy program, given the cap on ECAF rate increases.	<b>U</b>	DWP and the City should:  9. Develop a cost recovery mechanism that addresses RPS costs on both a short-term and long-term basis and provides complete transparency of the costs of achieving its RPS goals.
	6. As currently structured, the ECAF does not provide for transparency of RPS costs.	<b>U</b>	DWP should:  10. Ensure it has the accounting structures in place to isolate and capture all identifiable and incremental RPS costs for recovery. All major categories of costs should be captured.

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Description of Recommendation Ranking Codes

**U - Urgent** - The recommendation pertains to a serious or materially significant audit finding or control weakness. Due to the seriousness or significance of the matter, immediate management attention and appropriate corrective action is warranted.

**N - Necessary** - The recommendation pertains to a moderately significant or potentially serious audit finding or control weakness. Reasonably prompt corrective action should be taken by management to address the matter. Recommendation should be implemented no later than six months.

**D - Desirable** - The recommendation pertains to an audit finding or control weakness of relatively minor significance or concern. The timing of any corrective action is left to management's discretion.

**N/A** - Not Applicable

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**APPENDIX B  
INTRODUCTION**

NorthStar conducted a study of renewable portfolio standards throughout the Western United States. The study compared the practices and obstacles of other utilities with those of the Los Angeles Department of Water and Power. The objective of the study was to identify best practices that are applicable and would benefit the City of Los Angeles as it implements its renewable portfolio standard.

This best practices study was conducted through interviews with utility representatives and internet research. NorthStar selected over 30 utilities for possible comparison to DWP. These targeted utilities were selected based on having a state-mandated renewable portfolio standard, geographical proximity, varying governance structures (municipal, investor-owned, public power authority etc.), and interconnection with the Western Electric Coordinating Council (WECC) or the Electric Reliability Council of Texas (ERCOT). The WECC and ERCOT are regional transmission networks that interconnect multiple utilities over large geographical areas.

Ultimately we conducted twelve interviews with subject matter experts representing 10 utility holding companies across seven states. Two of ten holding companies owned more than one operating utility. The utilities and states are listed below:

**Exhibit A-1  
Participating Utilities**

Utility	States
Arizona Public Service	Arizona
Austin Energy	Texas
PacifiCorp Pacific Power and Light Utah Power and Light	California Nevada Oregon Utah Washington
Public Service of New Mexico	New Mexico
Sacramento Municipal Utilities District (SMUD)	California
Salt River Project	Arizona
Seattle City Light	Washington
Sierra Pacific Resources Nevada Power Sierra Pacific Power	Nevada
Southern California Edison	California
Tucson Electric Power	Arizona

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NorthStar developed the survey in collaboration with the City Controller's Office. The survey consisted of 27 questions focused on regulatory environment, cost, and project development. Exhibit A-2 provides the survey questions.

**Exhibit A-2  
Survey Instrument**

Survey Questions
1. Does the State or jurisdictional entity have a renewable portfolio goal or requirements? Does the utility have a goal or requirement? RPS establishment date, target date and amounts, and muni/cooperative differences from State?
2. What are the eligible technologies?
3. Can requirements be satisfied with Renewable Energy Credits or must it be delivered?
4. Are there penalties for non-compliance?
5. Is there a policy/regulatory requirement for generator ownership over contracting for power?
6. Is there a regulatory/policy requirement for renewable certification? Is there an internal policy?
7. Is there a regulatory/policy requirement setting maximum generator size limits?
8. Is there a mandated resource mix target? Is there an internal one?
9. When is the utility peak?
10. What is the formula for determining relative portion of renewable resource mix?
11. Do you have an active DSM program? If yes, describe how RPS and DSM programs are coordinated especially with respect to load forecast adjustments and rate impacts.
12. Do you have an active power trading strategy and program? If yes, describe how RPS and power trading activities are coordinated and integrated especially with regard to green energy purchases and minimizing RPS portfolio costs.
13. Is there a perceived bias or requirement for local resource versus elsewhere?
14. Are there interconnection/transmission barriers or challenges? How is it handled?
15. How close are you to achieving targets and what are the perceived barriers?
16. Have you encountered any of the following barriers? <ul style="list-style-type: none"><li>• Timely and cost-effective transmission access to remote RPS resources?</li><li>• Technical limitations on urban solar programs</li><li>• Economic limitations on urban solar programs</li><li>• Commercial non-viability of targeted technologies</li><li>• High cost of delivered RPS energy relative to conventional technologies</li><li>• Inadequate financing for RPS programs</li><li>• Permitting difficulties</li><li>• Work force bottlenecks</li></ul>
17. How is the program funded? Base rates or energy cost factor or surcharge?
18. Do you issue bonds specifically for renewable projects?
19. Do you offer incentives or upfront financing? If so, what?
20. Describe how the RPS and IRP processes are coordinated.
21. Are your power trading activities coordinated with the planning and execution of your RPS energy acquisitions?
22. Describe your monitoring/reporting processes (internal and external)? Is it part of a formal program?
23. Do you consider your process to be administratively independent from the office responsible for designing and executing your utility's RPS programs?
24. What performance metrics does your utility rely on to assess the effectiveness of its RPS investments? How are these metrics applied?
25. Did you identify any particular metrics which were particularly misleading or ineffective for gauging the success of your RPS investments?
26. Do you recommend other metrics and techniques for evaluating RPS programs?
27. How is system reliability maintained taking into account the variable nature of renewable resources?

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**SURVEY FINDINGS**

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The remainder of this appendix provides the results from the survey by question.

**Question 1: RPS Requirements**

**Finding:** Utilities that are specifically required to comply with state mandated requirements design their portfolios to meet the requirements. Utilities that have no specific requirements, such as Salt River Project and Austin Energy, have developed internal RPS policies that are lower than the state mandates.

**Finding:** Los Angeles and other California utilities will observe greater cost and rate impacts from their RPS in 2010 than neighboring states. This is due to a contribution of higher overall long-term RPS requirements and earlier integration of renewable technologies resulting in more immediate rate impacts.

**Discussion:**

All the other pacific and southwest states are lagging Los Angeles in the magnitude of the standard and in current requirements. While California and Los Angeles are requiring an RPS of 20 percent in 2010, the second closest requirement is 12 percent in Nevada.

Utility	2010 RPS Requirement	Final Requirement
Arizona	2.5 percent	15 percent in 2025
Austin Energy	10.5 percent	30 percent by 2020
California	20 percent	33 percent by 2020
New Mexico	6 percent	20 percent in 2020
Nevada	12 percent	25 percent in 2025
Salt River Project	5 percent	15 percent in 2025
SMUD	20 plus 3 DSM	33 percent in 2020 plus 3 DSM
Washington	3.0 percent by 2012	15 percent in 2020
Texas	2000 MW by 2009	10,000 MW by 2025

Renewable resources are generally more costly than conventional resources. Geothermal resources are the most cost competitive of renewable resources and compete dollar for dollar with new coal plant construction. However, there are limited geothermal resources available in the United States and access to these resources will increase the cost of acquisition.

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<b>Technology</b>	<b>Cost to Construct (\$/kW)</b>	<b>Capacity Factor (percent)</b>	<b>Extended Cost (\$/kW)</b>
Solar	5,649	20.0	28,245
Wind	1,434	37.5	3,824
Coal	2,537	88.0	2,883
Nuclear	2,475	97.0	2,552
Geothermal	1,110	97.0	1,144
Natural Gas - CC	717	90.0	797
Natural Gas	411	90.0	457

Source: Austin Energy Resource Guide

Los Angeles currently has adequate generating resources without the addition of the requirements of the renewable standard.

**Question 2: Eligible Technologies**

**Finding:** There are differences in the eligible resources allowed in each state. Where latitude is allowed, DSM and cogeneration are treated as eligible RPS resources.

**Finding:** For both DWP and most of the utilities included in the survey, wind generation is a large component of the renewable portfolio mixes.

**Discussion:**

NorthStar reviewed the resource mix requirements of Arizona, California, New Mexico, Washington, Nevada, and Texas. Eligible resources vary from state-to-state. The following resources were eligible in all the states:

- Wind
- Geothermal
- Solar
- Biomass/Biogas (Texas does not count municipal bio waste)

Hydroelectric generation varies from state to state. Existing large fresh water (river) hydro facilities do not count toward compliance with state standards. Some states allow all new hydro facilities while some states limit hydro to “small” facilities and other states limit hydro to tidal and wave electric generation.

Some of the states permit demand-side management and co-generation as eligible resources to meet the renewable standards. None of the states interviewed has mandated the entire resource mix; however quite a few states have residential solar and other distributive generation requirements.

The composite resource mix of each utility varied based on transmission constraints, financial limitations, resource availability, and schedule requirements. Wind was a dominant component in most utilities’ resource mix.

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Wind generation is a financially efficient means for achieving compliance with renewable standards. Wind power is cost competitive with other renewable technologies and has the shortest lead time from project inception to completion. Wind power represents the following portions of each utility's renewable portfolio. The "sun-baked" states such as Arizona and Nevada are relying more heavily on solar installation at this time.

Utility	Wind (percent)
Public Service of New Mexico [Note 1]	82.1
Salt River Project [Note 2]	45.5
Seattle City Light [Note 3]	43.0
Sacramento Municipal Utility District [Note 4]	25.0
Austin Energy [Note 5]	75.0
PacifiCorp [Note 6]	>95.0

Note 1: [http://www.pnm.com/regulatory/pdf\\_electricity/renewable\\_plan\\_2011.pdf](http://www.pnm.com/regulatory/pdf_electricity/renewable_plan_2011.pdf), page 4

Note 2: <http://www.srpnet.com/environment/renewable.aspx>: excludes DSM and large hydro electric plants

Note 3: <http://www.seattle.gov/light/news/issues/irp/docs/SCLIRP2010.pdf>

Note 4: Interview

Note 5: Generation Plan

Note 6: <http://www.pacificorp.com/env/re.html>

**Question 3: Renewable Energy Credits**

**Finding:** Most states surveyed permit the use of bundled RECs with delivery to a specified delivery point on a grid or control area.

**Discussion:**

Renewable Energy Credits (RECs), are tradable, non-tangible energy commodities in the United States that represent proof that 1 megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource (renewable electricity). RECs can be bundled or unbundled. Bundled indicates that the utility has procured both the renewable energy and the REC. The energy has a specific delivery point. Unbundled RECs are credits that demonstrate that the renewable energy has been generated but what load was served and when is unknown.

States differ on the use of RECs to meet RPS targets. The table shown below gives a summary of the treatment of RECs by each state:

State	Rule
Arizona	Up to 20 percent of portfolio may be met with out of state RECs. The REC must have a designated transmission path to the utility. Salt River Project allows a small portion to be met with RECs that are re-bundled and delivered to AZ.
California	Currently – no. Commission is considering allowing up to 40 percent RECs if bundled and delivered to the ISO.
New Mexico	Must be bundled and delivered to New Mexico.
Washington	Must be bundled and delivered to the Pacific Northwest.

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State	Rule
Nevada	Must be bundled and delivered to the NV grid.
Texas	Must be bundled and delivered to ERCOT.

**Question 4 – Penalties**

**Finding:** Most utilities that are subject to state-mandated RPS targets are also subject to penalties if the targets are not achieved. Penalties are at the discretion of the State’s Public Utility Commission.

**Discussion:**

Typical penalties for RPS non-compliance are in the range of \$50/MWh. However, the penalties are discretionary. If a utility fails to meet its target in one particular year, it is typically allowed to apply credits from previous years to make up the shortfall. Some states also permit the utility to “pay back” a previous year’s shortage.

**Question 5 – Generation Ownership**

**Finding:** Government ownership of projects may not be the least cost option for the near term.

**Discussion:**

Utilities have three types of arrangements available to them to meet the RPS requirements.

- Ownership
- Purchased Power Agreements (PPAs)
- Lease with option to buy

The utilities in the survey have utilized PPAs extensively. The PPAs were a low risk efficient means to meet energy requirements in technologies that the utilities were not yet experts in building, designing, or operating and maintaining. A number of the utilities, however, are looking forward and are reevaluating their acquisition strategies.

Municipal utilities and government agencies are not able to take advantage of tax incentives for renewable generation that are available for taxable entities, such as the PTC, the ITC, and the temporary 30 percent grant option included in the American Recovery and Reinvestment Act (ARRA). In order to realize some of the savings afforded the developers through the tax attributes and economic stimulus grants, Salt River Project, Seattle City Light, SMUD, and Austin Energy obtain most of their renewable energy through purchase power agreements (PPAs).

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**Question 6 – Certification**

**Finding:** Certification increases renewable energy cost and is not mandated in all states.

**Discussion:**

The California Energy Commission certifies resources in California. Some other states utilize WREGIS certification. WREGIS is the Western Region Energy Generation Information System. WREGIS maintains generation databases and is responsible for validating ratings and output of generators. Nevada has its own certification – Nev Track. A list of certification requirements by utility is shown below:

Utility	Certification Requirement
Public Service New Mexico	WREGIS
Tucson Electric Power	None
Seattle City Light	WREGIS
Arizona Public Service	None
SMUD	None
Salt River Project	None
Southern California Edison	CEC
Nevada Power and Sierra Pacific Resources	NevTrack
PacifiCorp	WREGIS
Austin Energy	None

**Question 7, 8 and 9 – Generation Size, Mix and Utility Peak**

**Finding:** None of the utilities have state mandated generator size.

**Finding:** A number of states have mandated distributive generation requirements.

**Finding:** Most of the utilities in the survey are summer day time peaking utilities.

**Discussion:**

For reliability considerations, most utilities have several smaller renewable projects that are geographically dispersed throughout their transmission and distribution grids. Meteorological variability such as cloud cover and wind patterns usually do not occur over an entire service territory at the same time; therefore geographic dispersion reduces the chance that all renewable resources not generating at any given time.

None of the states have mandated 100 percent of the portfolio requirements; however portions of the portfolios are mandated in New Mexico, Arizona, and Nevada as follows:

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State	Requirement
Arizona	20 percent distributive generation
Nevada	6 percent solar
New Mexico	20% wind, 20% solar, 10% biomass/other, 3 % distributive generation, and 47% discretionary

**Question 10: Formula**

**Finding:** DWP’s methodology to calculate its percent renewable energy is consistent with industry standards.

**Discussion:**

DWP calculates its percent of renewable energy as follows.

$$R = 100 * E / S$$

Where R = percent renewable energy, E = renewable energy generated, and S = retail sales. This formula is the basis used by all of the participants in the survey. However, there are state specific adjustments made to “E” and “S” worth noting:

- Banking - renewable generated energy that exceeded the standard can be “banked” and saved toward future years. The numerator of the formula is modified to add in banked energy. Some states even allow the utility to “payback” under generated years from future over generation.
- Renewable Energy Credits (RECs) - The numerator of the formula is modified to add in purchases of RECs.
- Energy Efficiency – Retail sales (denominator) are increased to account for savings from Energy Efficiency (EE). Energy (numerator) includes the savings from EE in states that allow EE to count as a renewable resource.
- Distributive Generation (DG) – Retail sales are increased to account for the load served by distributive generation.
- Averaging – Retail sales are averaged for the past two years.

No utilities indicated that sales were weather-normalized in the calculation.



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**Question 11: DSM**

**Finding:** Most utilities have state-sponsored DSM programs. DSM savings are calculated based on the ratings of installed equipment. Future savings are calculated based on statutory requirements. DSM is integrated into the load forecast in a manner similar to what is done at DWP. Historical sales are increased by the amount of DSM savings, a forecast is prepared, and finally the DSM savings are subtracted.

**Discussion:**

The measurement of DSM savings is based on installed nameplate ratings. Conventional wisdom says that nameplate ratings are largely inaccurate and overstate the savings. Nevada allows for up to 25 percent of the renewable portfolio to be served through utility-sponsored DSM, thereby requiring Nevada Power to develop more accurate measurements of savings. Nevada Power has sponsored a very large and in-depth study to calculate DSM savings through Sandia National Labs.

**Question 13: Resource Location**

**Finding:** Most states have a preference for in-state generating resources or manufacturing of resource components.

**Discussion:**

Recent economic conditions and unemployment rates have put pressure on the utilities to use local resources to meet their renewable portfolio standards. Arizona enacted extra credit multipliers in its RPS, whereby the values of in-state generating, distributive generation, early construction, and in-state manufacturing of components are increased by 50 percent.

**Questions 14 and 16: Barriers and Challenges**

**Finding:** While all of the utilities in the survey indicated that transmission constraints are a significant barrier to implementing the RPS, transmission constraints are not an immediate impediment for DWP.

**Discussion:**

DWP has a defined transmission system plan to meet its RPS. Requests for Proposals for renewable resources require that the generator be geographically interconnectable with the DWP's transmission pathways. DWP owns and operates an expansive transmission system that interconnects to renewable generation markets. DWP has right-of-way throughout the Owens Valley, central Utah, northern California, and the southwest. Expanding and optimizing this network, will allow DWP to connect renewable resources. Additionally, DWP plans to decommission Intermountain Generating Station (IGS) during the next

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20 years. Transmission assets associated with IGS will become available for delivery of other generating resources. Despite its existing network and planned upgrades, DWP may eventually face similar challenges to the other utilities in the siting and construction of new transmission facilities.

Utilities have developed a number of approaches for addressing transmission constraints:

- Salt River Project focuses on developing resources on customer premises and on geothermal development within the service territory.
- Seattle City Light utilizes a system of virtual delivery for a portion of its portfolio. The renewable energy is generated and delivered to local load and the City accepts delivery of the output 60 days later.
- Texas planned for Green Energy Transmission Zones in the early part of the decade. These zones were codified into state law. While resistance to new transmission exists, the state law supersedes regulatory commission control and community activism.

**Finding:** Uncertainty in project completion and unstable financial markets are seen as the second largest barriers to implementing the RPS. One respondent stated that there may not be enough capital available to complete the RPS's as mandated in the west.

**Finding:** The cost of installing solar roof-top is a barrier in meeting the distributive generation and solar diversity requirements of some states standards.

**Discussion:**

A number of states have RPS portfolio requirements that include a specified percentage to be achieved through solar distributive generation. At this time, solar technology is one of the most expensive to implement. While cash and financing incentives are offered, capital limitations dictate the number of recipients. Without incentives, this method may be cost prohibitive on a per kWh basis.

**Question 15: Current Compliance Status**

**Finding:** All of the utilities in the survey are meeting, or close to meeting, their current targets in total generation and have plans in place to meet future requirements. Some utilities, however, are having difficulties in meeting diversity requirements.

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**Discussion:**

New Mexico Public Service, while meeting the total generation requirements, foresees difficulties in meeting its solar requirements. They reported the cost of solar generation is an obstacle.

Arizona utilities meet the total generation requirements but foresee difficulties in meeting the distribution generation requirements in the current economic conditions.

**Question 17: Cost Recovery**

**Finding:** Los Angeles' recovery of RPS costs is generally consistent with other utilities. All utilities surveyed indicated that RPS costs are passed on directly to the customer in one form or another. There has been very little long-term debt financing by utilities of renewable resources at this time. Most utilities have entered into contractual arrangements.

**Finding:** Similar to DWP, the total utility long-term, all inclusive rate forecasts have not been publicly vetted. Most utilities surveyed accept the RPS requirements as a legal mandate and implement the RPS requirements as any other legal mandate. There appears to be very little public discussion by both the utilities and the regulators of the total final costs expected to be recovered from the ratepayers.

**Discussion:**

Utility electric rates are the mechanism used to collect revenue to meet a utility's annual costs, also known as their revenue requirement. There are three traditional components to most rate designs: base rates, energy cost adjustments (ECA), and surcharges.

- Base rates are those rates that have been filed based on known costs and future budgets. These rates are approved by the regulatory commissions and cannot change until a new rate case is filed.
- ECAs are approved mechanisms that allow utilities to recover fuel and purchased power costs. Commissions generally approve a formula and are advised with each change to the ECA rate. ECAs were developed for regulatory expediency. Costs such as fuel and purchased power which are procured on behalf of the customers are highly volatile. By approving a formula instead of an exact rate, a rate case would not be filed solely for fuel costs.
- Surcharges are recovered costs that are separately approved by commissions. They can either be a flat rate or a mechanism and are used for uncollectible expenses, low income subsidies, DSM programs, research and development etc.

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Renewable energy costs are not different than other utility energy costs and as a result, they are recovered like other energy costs. Depending on the method used to acquire the renewable energy, the utilities recover the costs as follows:

- Purchased Power Agreements (PPAs) are utilized for both renewable energy and traditional energy resources. Costs associated with energy procurement are usually collected through ECA mechanisms.
- Utility Asset costs are collected through base rates. Utility assets are those facilities a utility has built or purchased. Typically, capital costs are amortized over the life of the facility and collected through base rates. Associated fuel costs are usually captured through ECA mechanisms.

The following table provides a detailed list of how renewable energy costs are recovered from the rate base. Regardless of the mechanisms used the one commonality among all the participants is that revenue requirement is collected each year.

**Renewable Energy Cost Collection Methodology**

<b>Utility</b>	<b>ECA</b>	<b>Description</b>
Public Service of New Mexico	Annual adjustment	Includes fuel and purchased power
Arizona Public Service Tucson Electric Power	Annual adjustment	Includes fuel and purchased power above what is included in base rates. Renewable costs are collected in both the ECA and a Renewable Energy Standard Surcharge. The market value component is collected through the annual purchased power adjustment.
Salt River Project	Adjusted as needed	Adjustable energy component to recover market energy costs over what is included in the base rates.
Seattle City Light	None	Renewable resources are embedded into base rates. City Council approves rates as necessary.
Southern California Edison	Annual	Renewable energy costs (and all other) are collected and accrued in the energy resource recovery account. This is a balancing account and mechanism used by all of the IOUs in California. These costs are passed onto the ratepayers after CPUC approval. The process begins with a forecast of costs and the account is balanced at the end of the year.
SMUD	None	Most is embedded in base rates. The SMUD Board regularly approves rates to meet revenue requirement. There is also a PV generation surcharge added to each kWh of about 1 ¢/kWh.
Nevada Power	None	Renewable energy costs are recovered in the renewable energy portfolio rate. It is an energy surcharge and filed annually. Currently it is 0.573 ¢/kWh but NV Power is committed to expending \$2 billion in the next five years.
PacifiCorp	Depends on State	RPS is collected either through base rates or adjustable energy rates.

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Utility	ECA	Description
Austin Energy	None	Funded from volunteer participation from the Green Choice program. However, voluntary subscriptions will not meet new RPS requirements and AE has a rate case pending.

The methodology for recovering RPS costs is fairly consistent among the IOUs. Purchased power agreements above the baseline included in base rates are recovered either through the energy cost adjustment mechanism or a special renewable energy surcharge. Utility-owned projects capital costs are included in the rate base.

Seattle City Light recovers renewable costs through its rates without a cost adjustment mechanism. Seattle City Light's rates are approved by the City Council. At this time, the RPS costs are negligible as Seattle City Light has about 2.5 percent RPS at this time.

Austin Energy recovery of RPS costs has evolved. Until recently, Austin Energy had an optional green energy tariff that had sufficient subscription to fully fund the program. As the RPS requirement increased, Austin Energy entered into a number of purchased power agreements that has resulted in the filing of a rate case with the Austin City Council.

**Questions 18 and 19: Funding**

**Finding:** None of the utilities issue project-specific bonds for renewable energy projects. Instead they issue general purpose bonds.

**Finding:** None of the utilities offer financing for the development of renewable energy projects.

**Finding:** Most utilities offer rebates or financing incentives for customer-installed roof top solar facilities.

**Discussion:**

Austin Energy determined that it would not issue debt to fund the construction of renewable resource projects; therefore, Austin Energy-owned projects must be equity financed (through rates). At this time, it is largely to the ratepayers' financial advantage for Austin Energy to enter into PPAs.

**Question 20: Integration of RPS into IRP**

**Finding:** Most utilities integrate the RPS into their IRP by first determining the renewable requirements and designing the remainder of the portfolio utilizing traditional least cost planning.

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**Questions 12 and 21: Coordination of Power Trading Activities**

**Finding:** Renewable energy is a “must take” on all of the utilities’ systems through numerous contracts. Renewable energy is usually not traded on the wholesale market. Power trading activities are scheduled around available renewable energy deliveries.

**Question 22 and 23: Monitoring and Reporting Process**

**Finding:** Most utilities track renewable energy (and all energy) through their energy accounting function. Sales are provided from meter reads through the billing and accounting systems.

**Discussion:**

All of the utilities have annual reporting requirements of compliance with RPS targets. Most utilities have annual reports to their Board. Intermittent tracking is usually informal and managed by the supply planning functions. Tucson Electric Power utilizes the services of a third-party independent auditor to validate compliance with its targets.

**Questions 24, 25 and 26: Metrics**

**Finding:** None of the utilities surveyed maintain formal operational information, production cost information, or performance metrics by type of renewable generation source.

**Discussion:**

Currently most utilities have executed PPAs to meet their RPS requirements. The agreements or contracts stipulate the amount of generation to be procured and at what price. The contracts do not stipulate operating data.

**Question 27: Reliability**

**Finding:** Utilities have developed a variety of techniques to maintain adequate generation supply reliability, including the use of independent system operators and resource diversity to provide back up of variable renewable resources such as wind and solar.

**Discussion:**

Renewable resources such as solar and wind cannot be dispatched. These types of resources are dependent on weather and environmental conditions and by their nature cannot guarantee to provide energy at any given time or place or guarantee the length of time of operation. Utility operators have no control over the renewable resource output. As a result, they require contingency plans in the event a renewable resource suddenly becomes unavailable. Loss of a large renewable generator or the unavailability of a resource has impacts on system

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reliability such as ability to serve load, and unacceptable voltage level and system under frequency. System planning is required to plan for these contingencies. The survey found a number of methodologies for handling system reliability.

Utilities such as the California IOUs and Austin Energy are connected to large independently operated transmission systems. The transmission system provides a large pool of generation resources that are shared among all the members of the transmission system, thereby reducing system impacts and back up generation costs. The sharing of back-up resources among many participants offers those utilities a sharing of costs instead of incurring the entire costs singularly. ISOs may offer the following advantages:

- Geographic diversity – renewable resources are interconnected at multiple places on the ISO. The ISO includes all the transmission assets of PG&E, SDG&E and SCE. The likelihood of all renewable resources in California being unavailable at the same time is reduced.
- System Impacts - The system voltage and frequency impacts from a sudden generator outage is spread across a much larger system. While the loss of a generator on a single utility may represent 5 percent of resources, it may represent only 1 percent of the ISO.
- Back up generation – The participants in the ISO can share back up generation resources and the resulting costs.

Utilities that are not connected to an ISO still recognize the difficulties in maintaining system reliability with the variability of some renewable resources.

Some utilities have invested in more reliable renewable resources. SMUD has almost 50 percent of its renewable portfolio served by biomass and another 10 percent by geothermal. Southern California Edison has a goal of obtaining geothermal resources for 60 percent of its RPS.

Other utilities that do not have the availability of geothermal sites or significant agricultural waste, strive for geographic diversity in the siting of renewable resources. As discussed earlier, the Arizona and Nevada utilities are investing in large solar programs. In addition to geographic diversity, planning efforts consider facility size (MW) and what is necessary to maintain reliability if a facility has a sudden outage. Typical back up in these cases are small combined cycle turbines.

DWP relies on a variety of measures to ensure reliability. DWP uses a third party to provide firming and shaping services for its Pacific Northwest wind farms. Its wind farms are sited in various locations of different wind patterns to provide geographic diversity. DWP uses its existing hydro facilities for balancing of its other wind resources. DWP is also in the process of adding single-cycle combustion turbines at its Haynes generating station. Longer-term, DWP

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participates in the California Transmission Planning Group (CTPG). The CTPG executive committee includes the California ISO, DWP, SMUD, the IOUs, SCPPA and several irrigation districts. The CTPG was formed to address California's transmission needs in a coordinated manner that would respect various business models, and is committed to developing a California state-wide transmission plan to meet the State's 33% by 2020 RPS goal.

Seattle City Light utilized a unique approach to reliability. The energy is generated and used for local load. The metered amount is delivered 60 days later as a flat block.