

Port of Stockton

Renewable Portfolio Standard Procurement Plan

California Energy Commission 33% RPS Regulation

11/20/2012

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I. Executive Summary

In 2008 Governor Arnold Schwarzenegger signed Executive Order S-14-08 requiring the state's electric utilities to achieve an electric generating portfolio that supplies electricity from 33% renewable resources by 2020. Subsequently, Governor Brown signed Senate Bill X1-2 that specified a timetable with compliance periods leading up to the 33% by 2020 and charged the California Energy Commission (CEC) with enforcement through the California Air Resources Board.

The legislation was codified in the Public Utilities Code and an implementing 33% Renewable Resource Portfolio Standard (RPS) Regulation is under review by the CEC. It applies to all utilities in California and requires that the publically owned utilities develop a plan for renewable resource procurement and conduct a public hearing on the plan by January 1, 2013.

The Port of Stockton Staff has been investigating the incorporation of renewable resources into its supply portfolio since 2010. Staff in conjunction with a developer, did identify a project involving construction of 15,000 kilowatts of photovoltaic generating arrays on the roofs of 30 of the Port's warehouses on Rough & Ready Island. While the Port would purchase only the amount of power necessary to meet its requirements under the RPS the balance of the power was anticipated to be delivered to PG&E under one of its' PV Requests for Bids. The project was defined and an estimate of its costs developed resulting in an average cost of \$0.14/kWh. Unfortunately, the developer was unsuccessful in its attempt to sell the output to PG&E.

Since that project the Port staff has been monitoring the development of the CEC RPS Regulation. In addition, the cost of photovoltaic power generation has come down significantly due to competition in the solar panel market. In order to meet the RPS requirements the Port staff proposes to utilize Renewable Energy Certificates (RECs) in 2013 and 2014 while at the same time undertaking the construction of a 1,500 kW solar power plant. This will enable the Port to meet the 20% renewable resource requirement in 2014 while minimizing the impacts on the economics of the Port's electric power supply.

The cost of renewable electricity supply is more than conventional supply. However, the impact on the Port's costs and ultimately electric rates, is somewhat mitigated through load growth. It is anticipate that the potential increase in power supply costs may be less than 10% and allow the Port to remain rate competitive with its' nearby investor owned utility.

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II. Regulatory History and Requirement¹

Following is the summary provided by the California Energy Commission regarding the history of the Renewable Portfolio Standard.

Established in 2002 under Senate Bill 1078, California's Renewables Portfolio Standard (RPS) was accelerated in 2006 under Senate Bill 107 by requiring that 20 percent of electricity retail sales be served by renewable energy resources² by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020, and on November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08 requiring that "...[a]ll retail sellers of electricity shall serve 33 percent of their load with renewable energy by 2020." The following year, Executive Order S-21-09 directed the California Air Resources Board, under its Assembly Bill 32 authority, to enact regulations to achieve the goal of 33 percent renewables by 2020.

In the ongoing effort to codify the ambitious 33 percent by 2020 goal, Senate Bill X1-2 was signed by Governor Edmund G. Brown, Jr., in April 2011. This new RPS preempts the California Air Resources Boards' 33 percent Renewable Electricity Standard and applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

The Energy Commission and the California Public Utilities Commission work collaboratively to implement the RPS. The original RPS legislation assigned the Energy Commission with the following responsibilities:

- Certify renewable facilities as eligible for the RPS.
- Design and implement a tracking and verification system to ensure that renewable energy output is counted only once for the purpose of the RPS and for verifying retail product claims in California or other states.

Senate Bill X1-2 increased the Energy Commission's role with responsibilities specific to publicly owned utilities:

- Directs the Energy Commission to adopt regulations specifying procedures for enforcement of the RPS for publicly owned utilities.

¹ Source: California Energy Commission Website, Renewable Portfolio Standards (RPS) Proceeding Docket # 11-RPS-01 and 03-RPS-1078 discussion.

² "Renewable electrical generation facility" means a facility that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology. Public Resources Code 25741 (a) 1.

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- Requires the Energy Commission to certify and verify eligible renewable energy resources procured by publicly owned utilities and to monitor their compliance with the RPS. The Energy Commission will continue to certify and verify RPS procurements by retail sellers.
- The Energy Commission refers the failure of a publicly owned utility to comply, to the Air Resources Board, which may impose penalties.

Implementation of the Renewable Portfolio Standard is accomplished through the Public Utilities Code.³ During 2012 the California Energy Commission has been conducting a rule-making to codify the requirements of the Public Utilities Code into regulations. The regulations are scheduled for adoption by the Commission mid-February 2013.⁴ The Public Utilities Code and the draft regulations⁵ were used to specify the detail assumptions of the implementation plan included in this document.

There are not only requirements as to the percent of retail sales to be supplied from renewable resources but also the type/location of renewable resource and use of Renewable Energy Certificates⁶. Table 1 summarizes the required amount of renewable resources as a percent of retail electricity sales and the amount of three types of Portfolio Content Categories.

Compliance Period	1/1/11- 12/31/13	1/1/14- 12/31/15	1/1/16- 12/31/19	1/1/20 and Beyond
RPS Percent of Retail Sales	20%	20%	25%	33%
Portfolio Content Category 1	>50%	>65%	>75%	=>75%
Portfolio Content Category 2				
Portfolio Content Category 3	<25%	<15%	<10%	=<10%

Table 1 - RPS Requirements

Portfolio Content Category 1 resource is one that is connected to the Western States grid (preferably within California) and whose power is delivered as generated in time and quantity.

Portfolio Content Category 2 resources are those that are also connected to the Western States grid but are delivered by an intermediary with “balancing and shaping” energy.

³ Public Utilities Code Division 1. Regulation of Public Utilities, Part 1. Public Utilities Act, Chapter 2.3. Electrical Restructuring, Article 16. California Renewables Portfolio Standard Program Section 399.11 - 399.31.

⁴ 33% Draft Regulations For Publically Owned Utilities, Angie Gould, California Energy Commission, July 30, 2012.

⁵ 33 Percent Renewables Portfolio Standard Pre-Rulemaking Draft Regulations, CEC-300-2012-001-SD2, California Energy Commission, July 2012

⁶ A Renewable Energy Certificate (REC) represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source. One REC equals 1,000 kWh.

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Portfolio Content Category 3 are Renewable Energy Certificates (RECs) that represents the property rights to the environmental, social, and other non-power qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source. One REC equals 1,000 kWhs.

III. Historical Renewable Resource Planning Activities

The Port of Stockton’s retail electric system has been in operation since May of 2003. At that time the Port took over the Rough & Ready Island Naval Ship Repair Facility and the existing electric distribution system. Retail electric sales were on average a little less than 300,000 kWh’s month. In 2008 sales had grown to in excess of 800,000 kWhs per month. See Figure 1.

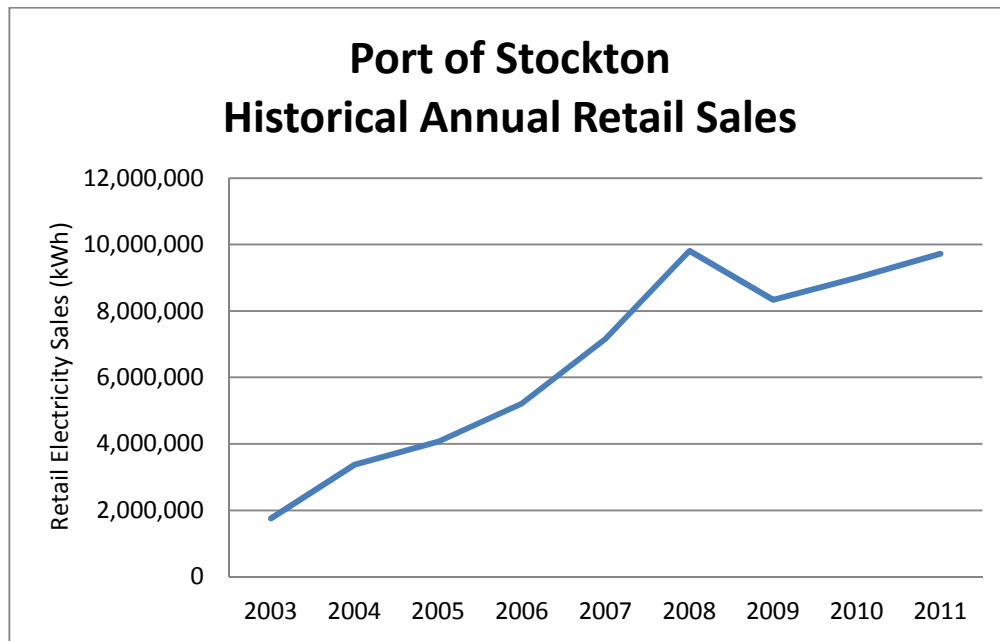


Figure 1 – Historical Annual Retail Electricity Sales

During 2009 and 2010 the Port’s retail electric sales dropped significantly due to the turn down in the economy. However, in late 2010 and 2011 the sales started to rebound. Because of the poor economy, 2009 through the first half of 2011 operations resulted in reduced electricity sales and significant stress on the Port’s electric utility financials. During this period, the Port’s retail electric rates were slightly under the nearby investor owned utility. The combination of the turndown in the economy and the need for competitive rates resulted in constraints being placed on utility expenses to remain competitive while addressing the reduced retail sales.

Its electricity supply was provided by one supplier from 2003 through May of 2011 under a fixed price, full requirements, and electricity contract. In early 2011 the Port of Stockton staff explored options to meet the requirements of the Renewable Portfolio Standard. At that time the price of wholesale electricity under its contract was approximately

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\$0.088/kWh⁷. Including all other capital and utility expenses the average cost of service was approximately \$0.16/kWh⁸. Table 2 compares the Port’s commercial and industrial electricity rates to the nearby investor owned utility’s retail electricity rates.

Port of Stockton Retail Rate Schedule	Average Rate/kWh	PG&E Retail Rate Schedule	Average Rate/kWh
GS-1	\$0.1711	A-1	\$0.17952
GS-2	\$0.1572	A-10	\$0.15818
GS-3	\$0.1365		

Table 2 - January 2011 Port of Stockton/PG&E Average Rates⁹

The Port staff recognized the competitive pressure of the surrounding utility and controlled costs under its existing cost structure to continue to provide competitive rates.

During 2010 and 2011 Port staff was working with a renewable developer to construct a utility scale, roof mounted, 15-20 MW photovoltaic system. The system would make use of approximately 30 of the warehouse roofs on Rough & Ready Island to host PV arrays that would produce renewable electric energy. The Port, in conjunction with the developer had completed the PG&E required System Impact Study as well as some preliminary work with the California Independent System Operator. The project concept involved constructing the PV system, transmitting a majority portion of the power through the Port’s electric system to its interconnection with PG&E where the developer would sell the remaining output to another party. The Port would participate in the project to the extent necessary to meet the requirements of the Renewable Portfolio Standard.

By April 2011 much of the planning work necessary to develop a project cost estimate had been completed. In an April 15, 2011 letter to the Port the developer advised the Port that the cost of the project would require a payment of approximately \$140/MWHR (\$0.14/kWh) to go forward.¹⁰ Including this cost in the Port’s cost structure would require a rate increase pushing the Port’s retail rate in excess of PG&E’s thereby making the Port non-competitive with PG&E. In addition, the CAISO had determined that it required a major Deliverability Study to determine the impact on the transmission system within the Stockton Area and that could not be accomplished during 2011. The developer also participated in the PG&E PV solicitation without success. The cost issues as well as the failure to have PG&E accept the Rough & Ready Solar Project in the bid process resulted in the developer stopping the

⁷ January 2011

⁸ FY 2010-11 Budget.

⁹ Port of Stockton Average Billing Rate Accounting Electric Summary Billing and PG&E January 1, 2011 to February 28, 2011 “PG&E Bundled Commercial/General Service Electric Rates at a Glance”.

¹⁰ April 15, 2011 Letter to Jeff Kaspar from Richard Zahner, Rough & Ready Solar LLC.

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project. The Port had to regroup to determine a better course of action to address the RPS requirements.

IV. Current Load and Electricity Resources Planning

As part of the Port of Stockton’s resource planning and budgeting it prepares an annual five year load forecast. This load forecast is limited to just five years because of the volatility of the load. It has no residential customers, only commercial and industrial. Its total maximum demand is approaching 4 MW during 2012. It regularly receives inquiries from potential tenants that have loads that are in excess of the Port’s existing load. For this reason longer term planning presents some risks in the acquisition of electricity supplies that ultimately may not be utilized. The Port’s history and 2013-2017 load forecast is shown in Figure 2.

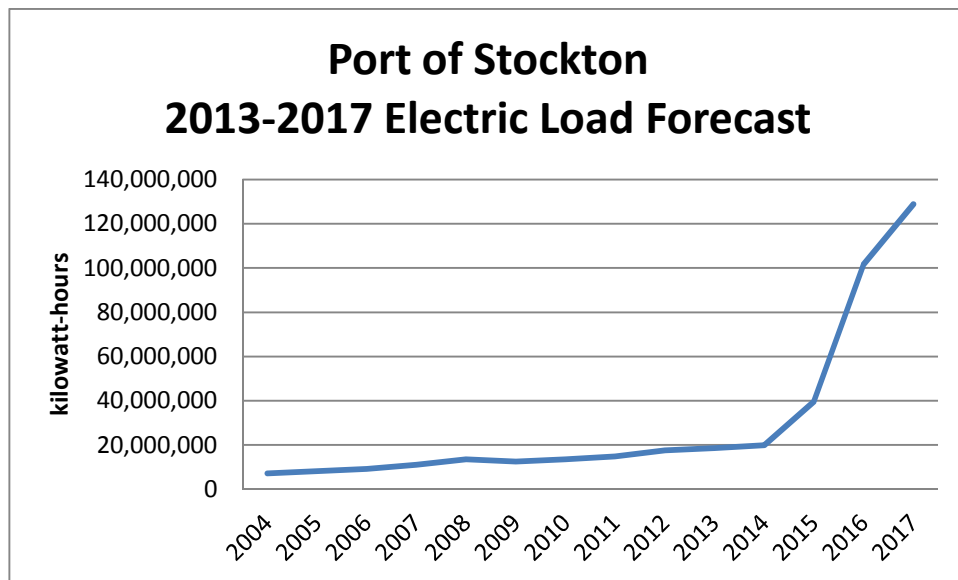


Figure 2 - Port of Stockton Historical and Forecasted Electric Loads

The electric load is forecast to increase substantially in 2015 through 2017. There are two major tenants that have agreements with the Port to site their facilities there. However, they typically reserve the right to change their plans. Although there is some risk and costs to the potential tenant to delay their expansion at the Port there is always a possibility that they will not go forward. For this reason the Port is recommending a short planning horizon for expansion of their electrical power supply. In establishing a course of action for complying with the Renewable Resource Portfolio Standard it will be considering options for meeting the 2013 and 2014 requirements. This is for the established load already existing at the Port’s facilities on Rough & Ready Island with a minor amount of growth.

Options for supplying the Port’s total electrical load include its existing supplier contract for power supply, other electrical power suppliers, a small allocation of Western Area Power Administration Central Valley Power starting in 2015, and the construction of a PV

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generating project or other technology as previously contemplated only on a smaller scale. The mix of resources selected will include consideration of RPS requirements.

RPS requirements involve a percentage of retail sales being met from renewable resources, the type and location of renewable resources (described in the draft Regulation as Portfolio Content Categories) and the purchase of Renewable Energy Certificates (RECs)¹¹. Table 3 lists the resources and the limitations on how renewable resources can meet the RPS.

	Forecast				
	2013	2014	2015	2016	2017
System Input	18,649,695	19,881,073	39,568,694	101,692,068	128,757,909
Losses	1,305,479	1,391,675	2,769,809	7,118,445	9,013,054
Load at Meter	17,344,216	18,489,397	36,798,885	94,573,623	119,744,856
Internal Port Load	5,203,265	5,546,819	6,000,000	6,500,000	7,000,000
Retail Sales	12,140,951	12,942,578	30,798,885	88,073,623	112,744,856
RPS % of Sales¹²	20.0%	20.0%	20.0%	25.0%	25.0%
RPS Energy Requirement	2,428,190	2,588,516	6,159,777	22,018,406	28,186,214
Unbundled REC %¹³	25.0%	15.0%	15.0%	15.0%	10.0%
REC Energy	607,048	388,277	923,967	3,302,761	2,818,621
Number of RECs	607	388	924	3,303	2,819
Remaining RPS Generation Req.	1,821,143	2,200,238	5,235,811	18,715,645	25,367,593
RPS PV Energy Plant Factor¹⁴	0.19	0.19	0.19	0.19	0.19
RPS Solar Capacity (kW)	1,094	1,322	3,146	11,245	15,241

Table 3 - Determination of Renewable Resource Requirements

Table 3 combines the load forecast with a calculation of the amount of renewable energy required as specified by the draft RPS Regulation as well as an estimate of the amount of RECs and RPS Solar Capacity necessary to meet the 20% renewable requirement in 2013 and 2014. RECs will be used in the year purchased for as long as the retail load meets the forecast otherwise carried forward for the life of the REC (3 years). RECs will be retired in the year used.

From the load forecast and resource options costs can be determined for budget and financial impact on the system. Table 4 provides a buildup of the components of the Port's power supply costs.

¹¹ A REC (pronounced: rĕk) represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source.

¹² July 2012 Draft RPS Regulation, CEC, Section 3204(a)(2).

¹³ July 2012 Draft RPS Regulation, CEC, Section 3204(c)(5 and 6).

¹⁴ Typical Plant Factor for a photovoltaic plant operating in the Central California area.

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Purchase Power		2013	2014
System Input (kWh)		18,649,695	19,881,073
Contract Energy (kWh)		14,937,600	14,980,000
Contract Power (\$)		\$758,950	\$814,381
PV Plant Energy	0.19		2,496,600
Annual Cost of PV Plant			\$285,227
Additional Energy (kWh)		3,712,095	2,404,473
Cost of Additional Energy (\$)		\$144,772	\$98,463
Demand (kW-Mo.)		45,254	49,359
Resource Adequacy Cost (\$+15%)		\$156,126	\$178,803
Energy at Meter (Losses = 7%)		17,344,216	18,489,398
Internal Port Load	30.00%	5,203,265	5,546,819
Retail Sales		12,140,951	12,942,579
RPS Requirement (%)		20%	20%
RPS Energy Required (kWh)		2,428,190	2,588,516
Less POS Renewable Resources		0	2,496,600
REC Energy Needed		2,428,190	91,916
Maximum RECs % of RPS Req.		25%	15%
REC Energy		607,048	388,277
MAX RECs (1 REC=1,000 kWh)		607	388
RECs Required		607	388
RPS RECs Cost ¹⁵		\$911	\$679
CAISO Charges		\$332,524	\$372,204
Monthly Service Fee		\$18,000	\$18,000
Total Power Supply Cost		\$1,411,283	\$1,772,171
Average Cost/ kWh		\$0.07567	\$0.08914
Renewable Resource Cost			
1. PV Plant			
a. Size (kW)			1,500
b. Capital Cost +10%			\$1,815,000
c. Annual Debt Service (20 yr.)	5.00%		\$145,640
d. O&M (\$/kW) ¹⁶	\$96		\$144,000
e. Total Annual Cost			\$289,640
f. Cost/kWh			\$0.1160

Table 4 - Cost of the Power Supply to Meet the Port Electric Load.

Table 4 provides the cost of the power supply in 2013 and 2014 necessary to meet the load including Resource Adequacy capacity, the cost of RECs where usable and the estimated cost of the 1,500 kW PV power plant. The Port's engineer's initial estimate of the capital

¹⁵ Based on November 19, 2012 proposal from Shell Energy NA for 2013/14 RECs.

¹⁶ National Renewable Energy Laboratory, NREL/SR-6A20-48595, November 2010, page 116, escalated to 2012.

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cost of photovoltaic power plant to be \$1,650,000.¹⁷ Annual cost of debt service and operation and maintenance is anticipated to be less than \$300,000. The average cost of total supply increases due to the higher incremental cost of the photovoltaic power plant.

Incorporation of the photovoltaic power plant and the cost of RECs increase the 2014 average power supply costs by approximately \$0.009/kWh or 12%. This is mainly due to the incorporation of the photovoltaic power plant with an average cost of approximately \$0.11/kWh plus the cost of RECs.

Although the increase in power supply costs raises the overall costs for the utility, load growth tends to mitigate the impact on the system operating costs and thus retail rates. There are also increases in contract costs and the overall cost of additional power the Port will need. The overall increase in retail rates is anticipated to be less than 10%. This is due to averaging of the relatively stable other costs of existing interest, distribution system operation and maintenance, and administrative and general expenses.

As the Port's staff works through the process of implementing the RPS Procurement Plan there may be changes in factors influencing the outcome. Any changes in the plan will be reviewed by the Port's staff and submitted to the California Energy Commission.

¹⁷ HCS Engineering, May 31, 2012 draft proposal for engineering services.

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V. Proposed Plan

In order to address the need to meet the Renewable Resource Portfolio Standard the Port of Stockton is proposing to meet the first compliance period target through a combination of Renewable Energy Certificates and the construction of a utility owned 1,500 kW Photovoltaic Power Plant. In 2013 and 2014 the Port will expend substantial funds to design and construct the power plant while purchasing the maximum allowable Renewable Energy Certificates. In order to use RECs the Port will have to join the Western Renewable Energy Geographic Information System.¹⁸

In 2014 it is anticipated that it will meet the 20% retail sales requirement target through this strategy. As the cost and the impacts of the change in supply and load growth become better known the change in the electric system revenue requirement and its impact on retail rates can be better understood and acted on. Table 6 compares the Port’s current rates to PG&E’s current rates.

Port of Stockton Retail Rate Schedule	Average Rate/kWh	PG&E Retail Rate Schedule	Average Rate/kWh
GS-1	\$0.1711	A-1	\$0.18531
GS-2	\$0.1572	A-10	\$0.15876
GS-3	\$0.1365		

Table 6 - July 2012 Port of Stockton/PG&E Average Rates¹⁹

The difference between the Port’s GS-1 and PG&E’s A-1 average rate is approximately 8.3% with PG&E being higher.

Alternatives to this plan involve researching available renewable resource projects outside the Port’s local system boundary and attempting to negotiate a position in that resource. In addition, resources outside the Port’s system will require use of the CAISO’s transmission system and the attendant costs and operational requirements.

Enforcement of this plan is accomplished through action by the Port’s Executive Director to require staff to proceed with its implementation and necessary steps to meet the RPS.

¹⁸ In order to use RECs the Port will have to join the Western Renewable Energy Geographic Identification System (WREGIS). The Western Renewable Energy Generation Information System is a database designed to track all renewable energy generation in the geographic area of the Western states. Participating in the WREGIS has an annual fee of \$1,500 plus a charge of \$0.005 to \$0.01/REC when issued, transferred or retired.

¹⁹ Port of Stockton Average Billing Rate Accounting Electric Summary Billing and PG&E July 1, 2012 to Present “PG&E Bundled Commercial/General Service Electric Rates at a Glance”.