

**ORIGINAL**



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**Tucson Electric Power Company**

One South Church Ave., P.O. Box 711  
Tucson, Arizona 85702

April 1, 2010

Docket Control  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, AZ 85007

Re: Decision No. 70652, Docket No. E-01933A-07-0594  
2010 Renewable Energy Standard and Tariff Compliance Report

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Pursuant to A.A.C. R14-2-1812, each Affected Utility shall file with Docket Control a report that describes its compliance with the requirements of the Renewable Energy Standard and Tariff ("REST") Rules. Decision No. 70652 (December 18, 2008) approved Tucson Electric Power Company's ("TEP") 2009 REST Plan. Please find enclosed an original and thirteen copies of TEP's 2010 REST Compliance Report for year-end 2009. This report contains confidential information that is being provided to Arizona Corporation Commission Staff separately.

If you have questions or comments please contact me at (520) 884-3680.

Sincerely,

Jessica Bryne  
Regulatory Services

Enclosures: Compliance Report

cc: Compliance, ACC  
Shannon Kanlan, ACC

Arizona Corporation Commission  
**DOCKETED**

APR -1 2010

DOCKETED BY

# ***Tucson Electric Power Company***

**Response to R14-2-1812 Utility Reporting Requirements**

**of the**

**Arizona Corporation Commission**

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## **RENEWABLES DATA FOR YEAR-END 2009**

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A UniSource Energy Company

**P.O. Box 711**

**Tucson, Arizona 85702**

## Executive Summary

The Renewable Energy Standard and Tariff R14-2-1801 ("REST") became effective August 14, 2007 following approval from the Arizona Corporation Commission ("Commission"). Among other things, the REST rules require Tucson Electric Power Company ("TEP") to generate or purchase at least 15% of its total annual retail energy requirements from eligible renewable energy resources by 2025, with smaller amounts required in earlier years.<sup>1</sup> This report covers TEP's progress from January 1, 2009, through December 31, 2009.

TEP's specific REST target for this period was **187,414,860** Renewable Energy Credits ("REC"). That amount represents 2% of TEP's retail energy sales for 2009.<sup>2</sup> The REST requires that 15% of those RECs be met through distributed energy ("DE") renewable resources, which represents a total of 28,112,230 kilowatt-hours ("kWh"). Of the 15% met through DE resources, 50% must come from residential customer systems and 50% must come from non-residential, non-utility applications. The remaining portion of the REST required RECs for 2009, 85% or 159,302,631 kWh, comes from utility-scale renewable energy resources.

TEP far exceeded its 2009 utility-scale REC target with **332 million** RECs. Included in the 332 million RECs are RECs that were carried over (not retired) from 2008 as well as RECs produced in 2009. The total REC amount represents TEP's actual kWh production from eligible renewable energy resources and energy purchases, as well as applicable extra credits that were achieved through the REST multipliers.

Table ES-1, found on the following page, summarizes the REST compliance goals for 2009, the progress TEP has made in achieving those goals, and the installed capacity for each category of resource, including utility-scale resources, residential DE resources, and non-residential DE resources. From the table it is apparent how TEP far exceeded the utility-scale REC goals for 2009. A detailed explanation of TEP's achievements for each category of resource follows the table.

In Commission Decision No. 70652 (December 18, 2008), the Commission approved TEP's 2009 REST Implementation Plan, including an annual budget of \$29.7 million.<sup>3</sup> Of the \$29.7 million, TEP spent \$18.6 million, including \$8.5 million on customer incentives. All of the funds originally allocated for commercial DE projects were in fact reserved for commercial DE projects, and over \$6 million was reserved for residential photovoltaic ("PV") projects. An additional \$201,000 was reserved for solar water heating projects. The amount collected from customers through the surcharge (relative to program expenditures) will be deferred and reflected in TEP's financial statements as a regulatory liability. REST funds that were not spent will be deducted from the annual approved funding in the following year's Implementation Plan.

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<sup>1</sup> Under the REST, eligible renewable energy resources include biogas electricity generation, biomass electricity generation, eligible hydropower resources, fuel cells that use renewable fuels only, hybrid wind and solar electric generation, new small hydro (10 MW or less), solar electric generation, wind generation. Distributed renewable energy resources include renewable CHP, commercial solar pool heaters, biomass and biogas thermal systems, biogas electric generation, geothermal space and process heating, solar daylighting, solar HVAC, solar space heating, solar water heating, and small wind generation (1 MW or less).

<sup>2</sup> One renewable energy credit, or REC, is equivalent to one kWh of production from an eligible renewable energy resource. Except for RECs from distributed energy resources, in order to receive credit for energy from an eligible renewable energy resource, the energy must be delivered to retail customers.

<sup>3</sup> The RES Tariff for TEP customers includes a \$0.008636 per kWh rate, and caps of \$4.50, \$75.00-\$350.00, and \$1,600.00 respectively for residential, commercial, and industrial customers.

## ES-1 2009 REST Compliance Summary

	Utility-Scale Resources	Distributed Energy: Residential	Distributed Energy: Non-Residential
<b>Installed Capacity</b>			
Pre-2009 (kW)	9,914	1,833	834
2009 New Installations (kW)	0	1,937	1,074
Reserved in 2009 but Not Yet Installed (kW)	32,000	2,055	10,999
<b>Renewable Energy Credits</b>			
Carry Over from 2008	85,443,475	31,842	0
RECs Created in 2009	272,473,075	6,201,462	2,101,275
Sold or Transferred	(32,781,000)	0	0
RECs Retired under GreenWatts Program	(1,457,354)	0	0
<b>Total Available RECs</b>	<b>323,678,196</b>	<b>6,233,304</b>	<b>2,101,275</b>
RECs Needed for Compliance	159,302,631	14,056,115	14,056,115
RECs Retired for Compliance	159,302,631	6,233,304	2,101,275
2009 Compliance (%)	100%	44%	15%
RECs Carried Forward to 2010	164,375,565	0	0

### Utility-Scale Renewable Energy Goals

TEP achieved the utility-scale renewable energy goals during the 2009 REST compliance period. The RECs retired for the 2009 compliance period came from landfill gas, solar PV, wholesale energy market short-term purchases, and partial manufacturing credits allowed through the REST. The surplus RECs available at the end of 2009 were carried forward to be used in future years. No new utility-scale capacity was added during 2009; the total cumulative installed capacity remains at 9,914 kW.

### Residential Distributed Energy Goals

TEP made great strides in its Residential DE program, adding over 1,000 new installations; this did not reach the 2009 goal, but TEP is committed to increasing residential DE programs going forward. The RECs retired for this period were associated with solar PV and solar hot water installations at residential sites. During 2009, TEP customers increased the installed capacity of residential PV systems by 87% from 1,662 kW to 3,103 kW. The installed capacity for solar hot water installations is equivalent to 667 kW. The following chart shows compliance scenarios for the DE requirement, taking into consideration annualized production values and system reservations.

	Residential			Commercial			Total DG kWh		
	Actual (Actual production Jan-Dec 2009)	Annualized (production prorated Jan-Dec for current)	Annualized Production + Annualized Reservations	Actual (Actual production Jan-Dec 2009)	Annualized (production prorated Jan-Dec for current)	Annualized Production + Annualized Reservations	Actual (Actual production Jan-Dec 2009)	Annualized (production prorated Jan-Dec for current)	Annualized Production + Annualized Reservations
Installed kWh	6,136,092	7,449,513	11,082,875	2,246,135	3,773,798	35,600,533	8,382,227	11,223,310	46,683,408
Total kWh	6,136,092	7,449,513	11,082,875	2,246,135	3,773,798	35,600,533	8,382,227	11,223,310	46,683,408
Required kWh	14,010,922	14,010,922	14,010,922	14,010,922	14,010,922	14,010,922	28,021,843	28,021,843	28,021,843
% Compliance met	44%	53%	79%	16%	27%	254%	30%	40%	167%

The chart above shows three compliance scenarios: (1) metered production from currently installed systems; (2) production that is annualized from currently installed systems; and (3) the annualized production from currently installed *plus* reserved systems (reserved systems are systems that are expected to be installed within 120 days).

### Non-Residential Distributed Energy Goals

TEP more than doubled its Non-Residential DE Goals during the prorated 2009 compliance period. Installed capacity increased from 834 kW installed capacity at the end of 2008 to 1,908 kW installed capacity at the end of 2009. Though these systems did not produce enough electricity to achieve the non-residential portion of the distributed energy goals, they still represent great progress in this area. TEP remains committed to increasing achievement in this area. That commitment, however, could not overcome issues outside of TEP's control, including:

- the lead time to develop and install a non-residential PV system (roughly one year or more);
- the continued credit crisis and economic state of 2009, which made it difficult to finance PV systems of sufficient scale; and
- developer concerns about Purchased Power Agreements ("PPA") and SSA regulation.

TEP expects to greatly surpass the 2009 Commercial DE REST goal going forward as non-residential customers have reserved 10,999 kW in PV systems. This is quintuple the current amount of installed capacity of 1,908 kW. On an annual energy basis, these reserved systems, together with current installations, will provide over 35 million kWh, which is 254% of the 2009 Commercial DE REST goal. TEP anticipates building these systems during 2010.

## **1. Introduction to TEP**

TEP, a regulated, investor-owned electric utility, has provided electric service to the community of Tucson, Arizona for over 100 years. TEP is the primary subsidiary of UniSource Energy Corporation (“UniSource”), which was incorporated in the State of Arizona in 1995 and obtained regulatory approval to form a holding company in 1997. Since 2001, TEP has aggressively pursued renewable energy development both on the customer side and on the utility side. TEP’s renewable energy history began with the inception of its SunShare program in 2001. This was quickly followed by the TEP-owned Springerville Solar PV array, which was constructed in 2002. Since then, TEP has offered many renewable programs, including the GreenWatts program, which allows customers to buy renewable power and pool resources to fund the construction of community-based solar projects.

This report covers TEP’s progress in meeting the Arizona REST requirements for the compliance period of January 1, 2009 through December 31, 2009. TEP made great strides in increasing renewable programs for all portions of the REST’s requirements. In fact, TEP far exceeded its total REC requirement with the utility-scale portion of the requirements; TEP’s DE portion was improved and will continue to improve, but it did not meet the 2009 requirement.

## **2. Renewable Energy Standard and Tariff Legislation and Requirements**

The REST R14-2-1801 became effective August 14, 2007 following approval from the Commission. Among other things, the REST rules require Tucson Electric Power Company (“TEP”) to generate or purchase at least 15% of its total annual retail energy requirements from eligible renewable energy resources by 2025, with smaller amounts required in earlier years.<sup>4</sup> The Commission determined that the REST should supersede the then existing Environmental Portfolio Standard (“EPS”), which like REST, was designed to encourage development of renewable generation. When the REST supplanted the EPS, the Commission ordered that all remaining EPS funds be transferred to the REST program and that TEP be released from all EPS requirements.<sup>5</sup> Accordingly, some of the RECs generated during the EPS program were transferred to the REST compliance period.

Table 1, on the following page, shows the REST Goals disaggregated by category for the period 2008-2025.

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<sup>4</sup> Under the REST, eligible renewable energy resources include biogas electricity generation, biomass electricity generation, eligible hydropower resources, fuel cells that use renewable fuels only, hybrid wind and solar electric generation, new small hydro (10 MW or less), solar electric generation, wind generation. Distributed renewable energy resources include renewable CHP, commercial solar pool heaters, biomass and biogas thermal systems, biogas electric generation, geothermal space and process heating, solar daylighting, solar HVAC, solar space heating, solar water heating, and small wind generation (1 MW or less).

<sup>5</sup> See Arizona Corporation Commission Decision No. 70314 (April 28, 2008).

**Table 1 - REST Goals 2008-2025**

<b>Year</b>	<b>REST Goals</b>	<b>Year</b>	<b>REST Goals</b>
2008	1.75% (10% DG)	2017	7.00% (30% DG)
2009	2.00% (15% DG)	2018	8.00% (30% DG)
2010	2.50% (20% DG)	2019	9.00% (30% DG)
2011	3.00% (25% DG)	2020	10.00% (30% DG)
2012	3.50% (30% DG)	2021	11.00% (30% DG)
2013	4.00% (30% DG)	2022	12.00% (30% DG)
2014	4.50% (30% DG)	2023	13.00% (30% DG)
2015	5.00% (30% DG)	2024	14.00% (30% DG)
2016	6.00% (30% DG)	2025	15.00% (30% DG)

*Source: Renewable Energy Standard and Tariff, Section R14-2-1804 and R14-2-1805*

TEP's first REST Implementation Plan was approved by the Commission in Decision No. 70314 (April 28, 2008), and became effective on June 1, 2008. At that time, the RES Tariff was added to customer bills.<sup>6</sup> After this date, the REST compliance period began, and the EPS compliance period ended.

## **2.1 TEP 2009 Compliance Requirements**

TEP's specific REST target for this period was **187,414,860** Renewable Energy Credits ("REC"). That amount represents 2% of TEP's retail energy sales for 2009.<sup>7</sup> The REST requires that 15% of those RECs be met through distributed energy ("DE") renewable resources, which represents a total of 28,112,230 kilowatt-hours ("kWh"). Of the 15% met through DE resources, 50% must come from residential customer systems and 50% must come from non-residential, non-utility applications. The remaining portion of the REC for 2009, 85% or 159,302,631 kWh, comes from utility-scale renewable energy resources. Table 2, on the following page, shows the breakdown of TEP's REST requirement for 2009.

<sup>6</sup> The customer RES tariff for 2009 was set at \$0.008636 per kWh, with caps for maximum monthly payment established for each customer class.

<sup>7</sup> One renewable energy credit (REC) is equivalent to one kWh of production from an eligible renewable energy resource.

**Table 2 - 2009 REST Goals**

Category	kWh Goal
Jan - Dec 2009 TEP Retail Sales	9,370,743,000
REST Goal @ 2% of Retail Sales	187,414,860
Distributed Energy @ 15% of REST Goal, including:	28,112,229
50% Residential DE	14,056,114
50% Non-Residential, Non-Utility DE	14,056,115
Utility Scale @ 85% of REST Goal	159,302,631

**2.2 Extra Credit Multipliers**

The REST order allows utilities to earn RECs from sources other than actual energy production based on applicable extra credit multipliers (“Multipliers”). These Multipliers include the Early Installation Extra Credit Multiplier, the In-State Power Plant Installation Extra Credit Multiplier, the In-State Manufacturing and Installation Content Extra Credit Multiplier, and the Distributed Solar Electric Generator and Solar Incentive Program Extra Credit Multiplier.

The Multipliers are applied to the energy generated by an eligible renewable energy resource. The energy generated by a given facility during a compliance period is multiplied by the multiplier, producing the “extra credit” earned by that facility. This “extra credit” is then added to the RECs produced by the facility as a result of its energy production to provide the total number of RECs generated by that facility during a given compliance period. The multipliers are additive, but the total multiplier cannot exceed 2.0. Table 3, below, shows each multiplier and its related value.

**Table 3 - REST Extra Credit Multipliers**

Extra Credit Multipliers	Value
Early Installation Extra Credit: Installed and Began Operating in	
2001	0.3
2002	0.2
2003	0.1
In-State Power Plant Extra Credit (1997-2005)	0.5
In-State Manufacturing and Installation Content (1997-2005)	0.5 * (% in-state content in installed plant)
DE Solar Electric Generator and Solar Incentive Program (1997-2005)	0.5

*Source: Renewable Energy Standard and Tariff, R14-2-1806.*

The Multipliers only apply to systems installed between January 1, 1997 and December 31, 2005. In some cases, the definition is even narrower. There is no expiration date for any of the Multipliers except the Early Installation Extra Credit Multiplier. The Early Installation Extra Credit Multiplier is only applied during the first five years following a facility's operational startup; as a result, 2008 will be the final year for applying this multiplier. The remaining Multipliers can be applied to facility generation for the life of the facility.

### 3. Overview of 2009 Compliance Status

TEP far exceeded its 2009 utility-scale REC target with 332 million RECs. Included in the 332 million RECs are RECs that were carried over (not retired) from 2008 as well as RECs produced in 2009. The total REC amount includes actual kWh production from eligible renewable energy resources, purchased renewable energy as well as applicable extra credits that were achieved through the REST multipliers. Table 4 summarizes the breakdown of the 326.7 million total RECs available to TEP, including those retired to meet each category of the REST 2009 requirements and the amount of surplus RECs. The certificate of retirement for the RECs retired for the 2009 REST compliance year can be viewed in that attached Appendix C. The surplus in RECs for the 2009 compliance period will be carried over to a future compliance period. More detailed calculations are included in Appendix A.

**Table 4 - 2009 Renewable Energy Credits for TEP**

	Utility-Scale Resources	Distributed Energy: Residential	Distributed Energy: Non-Residential
<b>Installed Capacity</b>			
Pre-2009 (kW)	9,914	1,833	834
2009 New Installations (kW)	0	1,937	1,074
Reserved in 2009 but Not Yet Installed (kW)			
	32,000	2,055	10,999
<b>Renewable Energy Credits</b>			
Carry Over from 2008	85,443,475	31,842	0
RECs Created in 2009	272,473,075	6,201,462	2,101,275
Sold or Transferred	(32,781,000)	0	0
<b>RECs Retired under GreenWatts Program</b>			
	(1,457,354)	0	0
<b>Total Available RECs</b>	<b>323,678,196</b>	<b>6,233,304</b>	<b>2,101,275</b>
RECs Needed for Compliance	159,302,631	14,056,115	14,056,115
RECs Retired for Compliance	159,302,631	6,233,304	2,101,275
<b>2009 Compliance (%)</b>	<b>100%</b>	<b>44%</b>	<b>15%</b>
RECs Carried Forward to 2010	164,375,565	0	0

As of December 31, 2009, TEP had reserved or installed over 30,000 kW of renewable generating capacity, excluding solar systems installed under the GreenWatts program. This amount reflects cumulative capacity, including the amount installed during EPS program years as well as the amount installed during the prorated 2008 REST program year, and the full 2009 REST program year. Over 10 MW in commercial DE projects were reserved during 2009. Of the over 10 MW of reserved projects, nine

projects were installed and began operation in 2009. The owners of the remaining reserved projects intend to install and operate them during 2010.

Table 5 disaggregates by technology the renewable energy generating capacity and installed kW capacity that TEP had in place at the end of 2009.

**Table 5 - Disaggregation of Renewable Energy Resource Installed Capacity by Technology**

Technology Type	kW Capacity, Cumulative	Annualized kWh production	2009 kW Capacity, New	2009 Actual kWh production
<b>Utility Scale:</b>				
Solar PV	4,912	8,350,400	0	7,120,428
Solar Thermal	0	0	0	0
Wind	2	3,465	0	0
Landfill Gas	5,000	n/a	n/a	16,591,491
<b>Subtotal Utility Scale</b>	<b>9,914</b>	<b>8,353,865</b>	<b>0</b>	<b>23,711,919</b>
<b>Distributed Energy:</b>				
Solar PV	5,011	8,518,408	2,515	6,070,105
Solar Thermal	667	1,155,169	496	1,040,429
Wind	0	0	0	0
<b>Subtotal DE</b>	<b>5,678</b>	<b>9,673,577</b>	<b>3,011</b>	<b>7,110,534</b>
<b>TOTALS</b>	<b>15,592</b>	<b>18,027,422</b>	<b>3,011</b>	<b>30,822,453</b>

Additional technology-specific detail is provided in sections 4 and 5, including the programs operated and the progress made during the 2009 compliance period. These sections describe the resources used to fulfill the utility-scale and DE components of the REST. Within the utility-scale and DE sections, the discussion is divided into technology-specific subsections.

### 3.1 2009 Expenditures and Surcharge

In Commission Decision No. 70652 (December 18, 2008), the Commission approved TEP's 2009 REST Implementation Plan, including an annual budget of \$29.7 million. The budgeted amount was for the 2009 REST compliance period (January 1, 2009, through December 31, 2009).<sup>8</sup>

This budget was adopted upon recommendation of the Arizona Corporation Commission Staff ("Commission Staff") over two plans that TEP had proposed, namely the Full Compliance and the Best Value Tariff Plans. Commission Staff's plan established goals for TEP to meet in order to be in full

<sup>8</sup> The RES Tariff for TEP customers includes a \$0.008636 per kWh rate, and caps of \$4.50, \$75.00-\$350.00, and \$1,600.00 respectively for residential, commercial, and industrial customers.

compliance with all segments of the REST requirements, including utility-scale, residential distributed energy, and non-residential distributed energy. In recommending this plan, Commission Staff relied on lower costs of DE administration and DE integration and lower levels of solar incentive payments (\$3/Watt) than TEP had outlined in its Full Compliance Plan. Further, the maximum monthly payments under this plan were less than the maximum monthly payments outlined in TEP's proposed Full Compliance Plan.

Of the \$29.7 million allotted to the REST program, TEP spent \$18.6 million, \$8.5 million of which went solely to customer incentives. In addition to the REST funds spent, all of the 2009 funds allocated to commercial DE funds were actually reserved for commercial DE projects. Over \$6 million was reserved for residential PV projects, and \$201,000 was reserved for solar water heating projects.

As detailed in sections 4 and 5, TEP encountered several barriers to implementation during the 2009 compliance period. None of these barriers were under TEP's control, but they did result in fewer project installations than initially anticipated. This lowered TEP's spending.

Table 6 below shows the breakdown of TEP's 2009 REST collections and expenditures. The 2009 total includes funds collected under REST and GreenWatts.

**Table 6 - 2009 REST Collections, Expenditures, & DE Reservations**

	2009 REST Collections (\$)	Expenditures (\$)	2009 Reserved Funds (\$)
<b>Total</b>	<b>\$ 29,025,014</b>	<b>\$ 27,202,039</b>	
Customer Incentives		\$ 8,519,696	\$ 10,126,680
Residential		\$ 8,189,434	\$ 6,426,680
Commercial		\$ 330,262	\$ 3,700,000
Program Administration		\$ 1,561,074	n/a
Utility-Scale Spending		\$ 7,732,071	n/a
Marketing & Outreach		\$ 759,582	n/a
GreenWatts	\$ 109,920	\$ 109,920	n/a

The amounts collected from customers through the surcharge (relative to program expenditures) will be deferred and reflected in TEP's financial statements as a regulatory liability. REST money that is not spent in a given year will be deducted from the annual approved funding in the following year. In other words, TEP does not keep the unspent REST dollars from 2009; they will be deducted from TEP's net REST funding in 2010.

Table 7, on the following page, shows the REST surcharge that TEP collected from its customers during the 2009 compliance period.

**Table 7 - REST Surcharge Collections from Customers in 2009**

Date	Residential	Small General Service	Large General Service	Large Light & Power & Mining	Total
Jan-09	\$1,358,893.30	\$745,001.01	\$206,234.04	\$51,850.58	\$2,361,978.93
Feb-09	\$1,228,808.13	\$667,489.15	\$196,610.76	\$57,618.04	\$2,150,526.08
Mar-09	\$1,310,382.66	\$743,907.37	\$224,021.94	\$57,492.88	\$2,335,804.85
Apr-09	\$1,265,780.31	\$756,744.88	\$226,966.83	\$58,217.95	\$2,307,709.97
May-09	\$1,296,365.25	\$711,521.37	\$193,284.70	\$56,914.87	\$2,258,086.19
Jun-09	\$1,473,807.44	\$911,451.57	\$227,142.64	\$56,627.90	\$2,669,029.55
Jul-09	\$1,557,585.62	\$925,903.69	\$215,309.39	\$57,529.58	\$2,756,328.28
Aug-09	\$1,506,267.98	\$923,747.19	\$211,462.85	\$58,614.53	\$2,700,092.55
Sep-09	\$1,417,734.53	\$891,425.63	\$205,984.17	\$59,255.97	\$2,574,400.30
Oct-09	\$1,406,047.71	\$823,993.29	\$209,751.86	\$59,567.72	\$2,499,360.58
Nov-09	\$1,195,439.71	\$644,847.22	\$179,351.16	\$54,028.31	\$2,073,666.40
Dec-09	\$1,329,224.12	\$743,202.92	\$207,190.15	\$58,413.26	\$2,338,030.45
<b>TOTAL</b>	<b>\$16,346,336.76</b>	<b>\$9,489,235.29</b>	<b>\$2,503,310.49</b>	<b>\$686,131.59</b>	<b>\$29,025,014.13</b>

#### 4. Utility-Scale Renewable Energy Resources

In 2009, 85% of TEP's REST goal was for utility-scale renewable energy resources. TEP met and exceeded this goal with short-term wholesale renewable energy purchases. TEP continues to negotiate contracts for additional utility-scale resources in order to meet future REST goals. TEP will reserve the renewable energy that it produced and carried forward from 2008 to meet REST compliance goals for future years. Section 4.1 describes the request for proposals ("RFP") competitive bid process that TEP uses to procure new utility-scale renewable energy resources. Section 4.2 describes TEP's compliance position relative to the 2009 REST utility-scale goals and breaks down these results along technology lines.

##### 4.1 Acquiring RECs from Utility-Scale Resources: Request for Proposals

TEP and UNS Electric, Inc. ("UNS Electric") issued one solar-only RFP in 2009. In response, TEP and UNS Electric received 58 bids. Accion Group, an independent auditor, found the RFP process and its results to be reasonable, fair, and transparent; attached Appendix B includes Accion Group's statement to this effect. TEP short-listed 24 of the proposals received in response to the solar-only RFP. As of the date of this report, TEP has not yet finalized contracts with any of these bidders. Because negotiations for all of the selected projects are ongoing in 2010, TEP has not finalized the audit report for 2009.

## 4.2 RECs from Utility-Scale Resources

TEP met and exceeded the utility-scale portion of the 2009 REST goal with short-term wholesale renewable energy purchases, though it has a variety of eligible renewable energy sources which were installed previous to the 2009 REST compliance period. TEP owns rights to a total of 272,473,075 RECs that were produced or purchased in 2009, and 85,443,475 RECs that were carried over from 2008. As a result, TEP has a total of 357,916,550 utility-scale RECs available to meet the 2009 REST goal. Of these, TEP sold a portion, retired a portion under GreenWatts, and retired another 159,302,631 RECs, thus fulfilling the 2009 REST goal. See Table 8 on the following page for a breakdown of these RECs by technology. Documentation of these retirements can be found in the attached Appendix C.

In 2009 TEP signed three contracts for future utility-scale renewable energy projects. These contracts have been submitted to the Commission for approval, and include a 25 MW solar PV project, a 5 MW concentrating solar power project, and a 1.6-2 MW landfill gas project. TEP has contracted to purchase the energy and RECs from these projects over a contracted time period. Construction on each project is scheduled to begin in 2010.

Table 8 - Technology-Specific Breakdown of Utility-Scale Resources

	Landfill Gas	PV	Concentrated Solar Power	Partial Manufacturing Credit (kWh)	Wholesale Renewable Energy Purchases	Wind
<b>Installed Capacity</b>						
Pre-2009 (kW)	5,000	4,912	0	n/a	n/a	2
2009 New Installations (kW)	n/a	0	0	n/a	n/a	0
Reserved in 2009 but Not Yet Installed (kW)*	2,000	25,000	5,000	n/a	n/a	0
<b>Cumulative Capacity</b>	7,000	29,912	5,000	0	n/a	2
<b>Energy Production</b>						
2009 REST Compliance Period (kWh)	16,591,491	7,120,428	0	n/a	236,897,000	0
Renewable Energy Credits (RECs)						
Carry Over from 2008	63,535,288	15,604,384	0	6,298,613	0	5,190
Sold or Transferred	(32,781,000)	0	0	0	0	0
RECs Created in 2009 From Energy Production	16,591,491	7,120,428	0	n/a	236,897,000	0
RECs Created in 2009 From Extra Credit Multipliers or Manufacturing Credits	414,787	4,491,565	0	6,957,803	0	0
<b>Total Available RECs</b>	47,760,566	27,216,377	0	13,256,416	236,897,000	5,190
RECs Retired under GreenWatts Program	1,457,354	0	0	0	0	0
RECs Retired for Compliance	0	0	0	0	159,302,631	0
RECs Carried Forward to 2010	46,303,212	27,216,377	0	13,256,416	77,594,369	5,190

\* Includes signed PPA contracts

#### **4.2.1 Landfill Gas**

In August 1999, TEP and the City of Tucson started producing electricity from the installation of a nameplate 5 MW landfill gas system at the Los Reales Landfill in Tucson, Arizona. The landfill gas is piped from the landfill to the Sundt Generating Station, where it is co-fired with coal and/or natural gas.

In 2009, TEP's landfill gas resource produced 16,591,491 kWh, equivalent to the same number of RECs. Applying the In-State Manufacturing and Installation Content Extra Credit Multiplier to this production added 414,787 RECs for 2009. In total, the landfill gas resource produced 17,006,278 RECs. See Appendix A for a detailed breakdown of TEP's landfill gas RECs.<sup>9</sup>

#### **4.2.2 Springerville Solar Generating System PV Array**

The Solar PV System located at the Springerville Generating Station ("SGS") has an approximate nameplate capacity of 4.6 MW. In 2009, the actual energy production was 6,954,488 kWh. Inclusive of applicable extra credits from multipliers, the total SGS RECs in 2009 were 11,340,533.

See attached Appendix A for a detailed breakdown of TEP's Springerville solar RECs. No SGS RECs were sold, nor retired, in the 2009 REST compliance period.

#### **4.2.3 Global Solar Partial Manufacturing Credit**

TEP buys RECs from Global Solar, under the REST Manufacturing Partial Credit (R14-2-1807) rule. This rule stipulates that an affected utility (TEP) can earn RECs using the following calculation:

$$\text{Nameplate capacity produced in AZ and sold Year } X * 2190 = \text{Total RECs}$$

As a result of its investment in Global Solar, TEP obtained 6,957,803 RECs in 2009 that are eligible to contribute to its REST requirement.<sup>10</sup> In 2009, Global Solar sold PV modules that were produced and sold at the Tucson facility with a combined nameplate capacity of 3,694 kW, a 49% increase over 2008 sales. Using the 2,190 factor implies a 25% capacity factor for these units when they are deployed.

#### **4.2.4 Operating Headquarters & De Mosse Petrie Solar Projects**

Operating Headquarters ("OH") projects consist of utility-sited solar or wind generating systems, including TEP's test site projects. De Mosse Petrie ("DMP") is a substation in TEP's service territory that has PV panels sited on the utility-side of the meter. In 2009, these projects produced (inclusive of applicable extra credits from multipliers) 271,461 kWh, all of which may be used toward the utility-scale REST requirement. See attached Appendix A for a detailed breakdown of TEP's OH and DMP solar RECs.

#### **4.2.5 Short-term Renewable Energy Wholesale Purchases**

TEP purchased REST eligible renewable energy (delivered into its service territory), and the associated RECs to be used towards its utility-scale requirement under REST. These purchases included energy and RECs from the following resources: biodiesel, geothermal, wind, biomass,

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<sup>9</sup> Some RECs generated by the landfill gas project are retired under the GreenWatts program; they are not eligible for retirement under REST.

<sup>10</sup> Manufacturing Partial Credits obtained from Global Solar are prorated between TEP and UniSource Energy Services, at a rate of 86% and 14%, respectively.

and biogas. A total of 236,897,000 kWh of energy was purchased from these renewable energy resources, a detailed list of which can be found in attached Appendix F. TEP fulfilled its 2009 utility-scale requirement with the retirement of these purchases, carrying forward the remainder of the purchased RECs for future resale and/or compliance periods.

## **5. Distributed Energy Resources**

The REST rules place special priority on DE resources and ramp up their contribution toward the total REST goal during the first five years under the standard. In 2009, DE accounted for 15% of the total REST goal. Of this amount, half of the RECs must come from systems sited on residential customer sites and half must come from systems sited on non-residential, non-utility sites. TEP achieved RECs toward this goal using a combination of RECs produced by existing and new resources.

Section 5.1 describes the process that TEP uses to procure RECs from new DE systems, the Renewable Energy Credit Purchase Program (“RECCP”). Section 5.2 summarizes TEP’s compliance position for RECs from DE installations, breaking down the results by the types of programs offered to different classes of customers. While a suite of technologies are eligible to participate in the DE program, only PV and solar water heating have been developed to date.

### **5.1 Acquiring RECs from Distributed Energy Resources: Renewable Energy Credit Purchase Program**

In accordance with REST, TEP developed and received approval for the RECCP. The RECCP is TEP’s credit purchase plan, which is required under REST. The goal of RECCP is to create a program that will provide incentives for affordable, environmentally sensitive, customer-sited renewable energy generation systems to supplement customers’ energy needs. This approach is intended to ensure that TEP meets its 2009 REST DE requirement. The Commission approved TEP’s RECCP as part of the 2009 Implementation Plan, effectively deeming it reasonable, fair, and transparent to all ratepayers.

The RECCP provides two primary forms of incentives to customers:

- **Up-Front Incentive (“UFI”)** - The UFI is based on installed capacity. The customer is given a one-time payment in exchange for TEP’s right to the RECs. The UFI is generally for residential customers, though commercial projects smaller than 20 kW are also eligible.
- **Performance-Based Incentive (“PBI”)** - The PBI is based on actual annual energy production, measured in kWh. The PBI provides a stream of payments to the customer for up to 20 years in exchange for TEP’s right to the RECs. The PBI is generally for commercial customers and is required for all commercial projects larger than 20 kW.

RECCP incentives can be applied to systems designed to serve only the typical load of the customer with whom the incentive agreement has been established. The assessment of that typical load does not preclude the periodic production of electricity in excess of the customer’s demand. Under some circumstances it is understood that select customer installations will be designed to serve loads greater than that of the customer. Under those circumstances, the RECCP incentive will be applied only to the fraction of the generation which is used to serve the typical customer load.

In exchange for the financial incentives that TEP provides to the customer, the customer transfers the rights to the RECs to TEP. TEP then applies the RECs toward the DE portion of the REST requirement. In return for TEP’s payment of a UFI, TEP will be given complete and irrevocable ownership of the RECs until December 31st of the 20th full calendar year after completion of installation of the system.

Operational life during that time frame must be supported by system warranty or planned maintenance schedules.

TEP's payment of a PBI will assure TEP complete and irrevocable ownership of the REC for the full duration of the PBI agreement. The agreement duration must fully coincide with the PBI payment schedule and the system must be supported by system warranty or planned maintenance schedules for the term of the agreement.

The RECPP provides for a uniform procedure and a transparent timeline to facilitate project realization. In order to receive an incentive from TEP, the customer must first submit a project request. Upon approval of this request, the customer receives a reservation confirmation, which reserves REST funds for that project. If the project is subsequently built within the required timeframe and meets all of the TEP RECPP conforming project guidelines, the customer is approved for the incentive for which it applied. The incentive rate depends on several factors: customer sector, capacity size of system (kW), technology type, and the year in which the reservation was approved.

See attached Appendix D for the 2009 RECPP Incentive Matrix for both UFI's and PBI's for all eligible renewable energy technologies as approved in the 2009 REST implementation plan.

## **5.2 RECs from Distributed Energy Resources**

TEP segments its DE programs according to the size of the system and the customer class. Commercial systems smaller than 20 kW are grouped with residential projects, which are typically below this threshold. The selection of these projects is governed by the RECPP project described earlier in Section 5.1. The RECs acquired through the development of these projects contribute to the residential or non-residential REST goals, depending on the site at which the system is located.

Commercial projects larger than 20 kW are considered separately within the RECPP process, typically through a PBI-styled application. Section 5.2.2 summarizes the status of projects in this category, which contributes toward the non-residential DE REST requirement.

**Table 9 - Technology-Specific Breakdown of Distributed Energy Resources**

	Residential PV	Residential Solar Thermal	Non- Residential PV	Non- Residential Solar Thermal
<b>Installed Capacity</b>				
Pre-2009 (kW)	1,652	171	834	0
2009 New Installations (kW)	1,441	496	1,074	0
Reserved in 2009 but Not Yet Installed (kW)	1,914	141	10,999	0
Cumulative Capacity	5,017	808	12,907	0
<b>Energy Production</b>				
2009 REST Compliance Period (kWh)	4,413,761	1,040,429	1,656,344	0
Annualized Energy Production (kWh)	8,528,336	1,155,169	21,941,815	0
<b>Renewable Energy Credits (RECs)</b>				
Carry Over from 2008	31,842	0	0	0
RECs Created in 2009 From Energy Production	4,413,761	1,040,429	1,656,344	0
RECs Created in 2009 From Extra Credit Multipliers	747,272	0	444,931	0
<b>Total Available RECs</b>	<b>5,192,875</b>	<b>1,040,429</b>	<b>2,101,275</b>	<b>0</b>
RECs Retired for Compliance	5,192,875	1,040,429	2,101,275	0
RECs Carried Forward to 2010	0	0	0	0

## 5.2.1 Residential & Small Commercial Distributed Energy

TEP operates two programs targeted at residential and commercial customers seeking to develop projects smaller than 20 kW. The economics of systems on this scale are similar regardless of whether the customer is a residential or commercial customer, which leads to efficiencies in offering a single incentive for the two customer classes. This section describes the two programs that are targeted at these smaller projects. The SunShare program, named under the REST predecessor EPS, provides incentives for PV projects of this scale, and the Solar Hot Water (“SHW”) program provides incentives for solar thermal (solar hot water) projects. Ongoing in REST compliance years, the SunShare program and the SHW program both fall under the RECCP (as would all other eligible renewable energy technologies).

During 2009, many residential and commercial reservations were restricted by the state and federal macroeconomic state and corresponding credit crisis, which lasted throughout 2009 and continues into 2010. This lack of liquidity in the marketplace made it more difficult to close financing on deals that had not already been closed.

### 5.2.1.1 SunShare PV

TEP has offered the SunShare program to its customers since the COMMISSION approved it under the EPS in 2001. Now incorporated into the RECCP, this program provides incentives for the installation of customer-sited solar PV systems, including both residential and commercial projects smaller than 20 kW, and commercial projects larger than 20kW. The SunShare program offers both UFIs and PBIs to

qualifying customers to install these systems. In 2009, the incentive payments offered were \$3.00/Watt, as outlined in the Commission Staff Plan approved by the Commission.

In 2009, **298** customers qualified for a SunShare/RECPP incentive payment. This participation increased cumulative participation in the program to 888 since the program's inception in 2001. Through the residential customer participation in 2009, 1,441 kW of new PV was installed as a result of the SunShare Program; together with existing residential systems, these new residential systems produced 4,413,761 kWh during 2009. Through the large commercial customer participation in 2009, 1,074 kW of new PV was installed as a result of the SunShare Program;<sup>11</sup> together with existing commercial systems, these new systems produced 1,656,344 kWh during 2009.

### **5.2.1.2 SunShare Solar Hot Water**

TEP began offering incentives for SHW systems in June 2008, as part of RECPP, the DE component of the REST Implementation plan. Commercial and Residential customer-sited systems installed as early as 1997 (retro-active systems) and through the end of 2009 can apply for an incentive through the RECPP process. The calculated kWh savings from each SHW project is based upon the SRCC OG-300 published rating of the system.

In 2009, 473 SHW systems, all of which were residential systems, received an incentive payment from TEP. The residential systems installed during 2009 resulted in the production of 474,238 kWh during 2009; when combined with the existing SHW systems, the residential SHW program generated 1,040,429 RECs that were applied toward 2009 residential DE compliance targets.

TEP's cost per REC for SHW systems is less than for solar PV because SHW produces energy for more hours than PV. Due to the heat transfer, SHW can last until 10 p.m. with storage. At higher altitudes, it has a slightly higher capacity factor, which further adds to the efficiency of energy production.

At the end of 2009, customers had reserved funds for an additional 394,080 kWh equivalent of SHW systems. Since these projects were likely not completed during 2009, the reservation of funds was transferred to the 2010 budget.

### **5.2.1.3 GreenWatts**

GreenWatts is a Commission approved TEP green power purchase program that enables commercial, industrial, and residential customers to pool funds and invest directly in the creation of green power. The renewable energy, as landfill gas, procured through GreenWatts does *not* count toward REST goals because the customers purchase the RECs; therefore, TEP cannot also own and retire the RECs. The purchase of the landfill gas for GreenWatts is funded by non-REST money. The community-based solar projects that are funded by the customer contribution to GreenWatts contribute energy production that does qualify under REST as eligible commercial DE systems. TEP counts this production toward the commercial DE portion of their REST requirement. What follows is a short description of the program and summary of its activity during 2009.

Each GreenWatt is sold in "blocks" of 20 kWh per month. Revenues from GreenWatts are used for installing more community-based solar generation, a program that is unique to UNS Energy Corporation. At the end of December 31, 2009, TEP had commitments from 2,365 residential customers, amounting to

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<sup>11</sup> This number also includes commercial systems installed under GreenWatts. Refer to the following section for more details on this program and its installations.

adoption of 62,132 blocks, and 50 commercial customers, amounting to 10,735 blocks of energy that provide 1,457,340 landfill gas RECs that are retired under GreenWatts exclusively.

The cumulative participants in the GreenWatts program amount to 5,861. 2009 revenues from GreenWatts amount to \$109,919.50. Table 10 below shows the annual revenues generated from the program. The landfill gas RECs retired under GreenWatts are excluded from retirement under REST. The certificate of retirement for the 2009 GreenWatts RECs can be found in attached Appendix E.

**Table 10 – GreenWatts for 2009.**

GreenWatts	2009 Revenues	2009 Blocks	Life-to-Date Revenues	2009 RECs retired under program
<b>Total</b>	<b>\$ 109,920</b>	<b>72,867</b>	<b>\$ 725,471</b>	<b>1,457,354</b>
Commercial	\$ 14,927	10,735	\$ 117,179	214,700
Residential	\$ 94,993	62,132	\$ 608,291	1,242,654

Total revenues produced to date are \$117,179 from commercial customers and \$608,291 from residential customers for total revenue of \$725,471. All of these funds have been, or soon will be, applied to installation costs of community based PV or SHW systems installed in the Tucson area. The energy production from these community solar systems generate RECs that TEP may use toward its commercial DE requirement under REST. The cumulative community-based GreenWatts installations including the 2009 installations are listed in Table 11 on the following page.

**Table 11 - Total GreenWatts Installations 2000-2009**

<b>GreenWatts Installation</b>	<b>Installation date</b>	<b>Installed Capacity (kW)</b>
Reid Park Zoo	2007	14.2
Pima Air Museum	2000	1.2
Tohono Chul	2002	2.8
Civano (Vail) School	2004	3
Hohokam School-TUSD	2004	4.48
Tucson Botanical Gardens 1	2005	3
Tucson Audubon Society-Mason Center	2005	1.35
Project MORE-TUSD	2005	15
Clements Center-City of Tucson	2005	6
Vail Empire High School	2005	6
Jewish Federation	2005	3.4
Tucson Airport Authority	2007	9.45
Tucson Botanical Garden-New Pavilion	2007	3.5
La Cima Middle School	2008	9.45
U of A Visitor's Center	2007	6.3
Tanque Verde High School	2007	10.15
Project Dunbar	2008	5.6
The Nature Conservancy	2009	3.4
Pima Community College East	2009	2.04
Pima County's Jackson Employment Center	2009	4.59
Casa De Palmas Rehabilitation	2009	3.06
El Rio Community Health Center	2009	9.18
<b>Total Installed kW to Date:</b>		<b>277.6</b>

### 5.2.2 Medium to Large Commercial Distributed Energy

Medium to large commercial distributed energy projects are more cost-effective than residential projects due to economies of scale, and several projects were considered during 2009. Many developers and public entities proposed several medium to large DE projects under RECPP PBI framework. Nine projects were completed through the RECPP program, including eight public projects owned and operated by the City of Tucson and one private project.

In 2009, **twenty-one** medium and large non-residential customers qualified for an incentive reservation through the RECPP, for a total of 10,999 kW of reserved capacity. Through medium and large non-

residential customer participation in 2009, 1,074 kW of new PV were installed; these new systems, in addition to the existing qualifying systems, produced approximately 1,656,344 kWh during 2009.

## **6. Looking Forward: 2010**

In January 2010, the Commission approved TEP's 2010 REST implementation plan, including a REST surcharge that is expected to collect \$32 million, or approximately \$0.008636 per kWh, from retail customers in 2010. Carry-over funding from 2008 and 2009 in the amount of \$12.05 million was also approved to offset the costs of implementing the REST projects and programs. REST implementation plans and the associated surcharge are submitted annually to the Commission for review and approval.

Although meeting the DE portion of the REST requirement is more costly per kWh than meeting the utility-scale requirement, the external benefits to the local and statewide economy are numerous due to the increased demand for the associated equipment and skilled labor necessary for quality installations.

Additionally, within the cost spectrum for DE, the cost to acquire a PV REC (kWh) is three times the cost to acquire a solar water heating REC. There are several new solutions listed below that TEP is either actively pursuing or researching in order to work toward meeting the residential goals.

- Bright Tucson Community Solar
- Solar rental/leasing concept
- Third party renewable sales to the utility on customer's premise (SunEdison's utility branded Commercial based solution)
- Third party financing availability

TEP has made several changes to its 2010 RECPP, including increasing the UFI threshold for small commercial systems to 100 kW, and adding a small commercial solar water heating incentive. These changes are likely to greatly increase the distributed renewable energy resources in the TEP service territory.

## **Conclusion**

During 2009, TEP achieved and exceeded its utility-scale REST goal. TEP was not able to generate enough RECs to comply with its residential or commercial DE REST goal, but still made strides in both areas. At the utility scale, short-term wholesale renewable energy purchases accounted for the retired compliance RECs. However, RECs from landfill gas, PV, and the partial manufacturing credit were created and reserved for future compliance years. On the DE side, PV and SWH were the resources that counted toward the goal.

TEP installed many new DE systems in 2009. While this was insufficient to generate the energy needed to meet the DE requirement, it still represents great progress for TEP. TEP customers installed 785 new DE systems during 2009 and reserved hundreds more, to be installed in 2010. Together with the large commercial reservations, the annualized energy production from all of these systems would have far surpassed the 2009 combined DE REST requirement and will make 2010 a great year. In the meantime, TEP did sign contracts for three new utility-scale renewable energy projects including a 5 MW concentrating solar power project. Other project negotiations resulting from the 2009 RFP are ongoing. TEP also awaits approval for its Community Solar program, a project that will provide significant DE RECs at a lower cost to customers. These projects will aid in TEP's aggressive pursuit of renewable energy, and will move TEP towards meeting REST goals in the coming years.

# Appendix A

## Breakout of TEP's 2009 RECs

Category	Production (kWh)	REC's Multiplier's Applied	Multiplier Value	Production (from multipliers)	Total RECs	Carryover Credits	REC's Sold/Transferred	REC's Retired
Landfill Gas	16,591,491	In-State Manufacturing and Installation Content	0.06	generation produced and sold in calendar year (-25% capacity factor)	17,006,278	63,535,288	32,781,000	1,457,354
Global Solar		Manufacturing Partial Credit			6,957,803	6,298,613		
	6,954,488	Annual kWh Production						
Springerville Solar	6,954,488	In-State Manufacturing and Installation Content	0.5 * % in-state cost	938,801				
	6,954,488	In-State Power Plant Installation Credit		3,477,244				
	6,954,488	Distributed Generation Credit	0.5	n/a				
Springerville-Wind		Annual kWh Production			11,340,533	15,614,384		
	165,940	In-State Manufacturing and Installation Content	0.5			5,190		
	165,940	Annual kWh Production						
	165,940	In-State Manufacturing and Installation Content	0.5 * % in-state cost	23,580				
	165,940	In-State Power Plant Installation Credit		82,970				
	165,940	Distributed Generation Credit	0.5	n/a				
Other Short Term Purchases	236,897,000	Annual kWh Production			273,461			199,902,631
Total Production	267,566,722			n/a	236,897,000			
Subtotal Non-DG					272,473,075			
	4,413,761	Annual kWh Production						
	4,413,761	In-State Manufacturing and Installation Content	0.15	97,470				
SunShare (DGCos)		In-State Power Plant Installation Credit		324,901				
		Distributed Generation Credit	0.5	324,901		31,842		5,192,875
GreenWatts (DGCos)	397,114	Annual kWh Production						
	397,114	In-State Manufacturing and Installation Content	0.5 * % in-state cost	47,817				
	397,114	In-State Power Plant Installation Credit		198,557				
	397,114	Distributed Generation Credit	0.5	198,557		842,045		842,045
Solar Hot Water (DG Res)	1,040,429	Annual kWh Production						
Other DG Commercial Global Solar CIGS (DGCos)	1,259,230	Annual kWh Production						
Total Production	7,110,535			n/a	1,040,429			1,040,429
Subtotal DG					1,259,230			1,259,230
2009 New Production (DG + NonDG)					8,302,737			
Carryover credits from 2008					280,775,811			
Sub-total 2009 RECS					85,475,317			
RECS sold, transferred, or retired for GreenWatts					366,251,128			
Total RECS available for 2009 REST Compliance					34,238,354			
RECS Retired for 2009 Compliance					332,012,774			
FINAL TOTAL (2009 new production + 2008 carryover - RECS sold, transferred, or retired)					167,637,210			
					164,375,565			

## **Appendix B**

### **Auditor's Statement of Fair Process and Procedure**

**REDACTED**

## Appendix C

### Documentation of TEP REC Retirements for 2009

(Signed Certificate available upon request)



## CERTIFICATE OF RETIREMENT OF RENEWABLE ENERGY CREDITS

### Original Certificate Issue

Certificate No. TEP/REST: WRE 00000001 - 159,302,631

Certificate No. TEP/REST: DERPV 4,956,756 - 10,149,631

Certificate No. TEP/REST: DERSIHW 395,087 - 1,435,516

Certificate No. TEP/REST: DECPV 1,871,959 - 3,973,234

On January 31, 2010 Tucson Electric Power Company (TEP) retired 159,302,631 Purchased Wholesale Renewable Energy Credits, 5,192,875 Distributed Energy-Residential-Solar PV Credits (DERPV), 1,040,429 Distributed-Energy-Residential-Solar Hot Water Credits (DERSIHW), and 2,101,275 Distributed Energy-Commercial-Solar PV Credits (DECPV) towards meeting its 2009 Renewable Energy Standard requirements.

1. TEP certifies that it derived the Wholesale Renewable Energy Credits from certified wholesale market trades that were delivered, and verified through WebTrader™, into the TEP service territory.
2. TEP certifies that it derived all other Utility Scale Solar and Distributed Energy Solar from Actual Generation of Electricity and the application of the multipliers as permitted by the FPS and the RES.
3. TEP further certifies that, at the time of this transfer, it had title to the Credits transferred to TEP and that such Credits have not previously expired, have not been otherwise used by TEP to meet its Environmental Portfolio Standard or Renewable Energy Standard requirements, and have not been transferred by TEP to any other entity.

Attested to:

Name of TEP officer - David Hutchens

Title - Vice President, Energy Efficiency and Resource Planning

Date - January 31, 2010

Signature \_\_\_\_\_

## Appendix D

### 2008-2009 RECPP Conforming Project Incentive Matrix

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWH)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWH)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWH)
	20-Year REC Agreement			
BIOMASS/BIOGAS (Electric)	NA	0.060	0.056	0.054
BIOMASS/BIOGAS - CHP (Electric) <sup>3</sup>	NA	0.035	0.032	0.031
BIOMASS/BIOGAS - CHP (Thermal) <sup>3</sup>		0.018	0.017	0.016
BIOMASS/BIOGAS (thermal)	NA	0.015	0.014	0.013
BIOMASS/BIOGAS (cooling)	NA	0.032	0.030	0.029
DAYLIGHTING (Non-Residential)	\$0.20/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL - (electric)	NA	0.024	0.022	0.022
GEOHERMAL - (thermal)	1.00/Watt	0.048	0.045	0.043
GEOHERMAL - (cooling)	NA	0.032	0.030	0.029
SMALL HYDRO	NA	0.060	0.056	0.054
SMALL WIND (grid-tied) <sup>4</sup>	\$2.50/Watt AC	0.145	0.135	0.130
SMALL WIND (off-grid) <sup>4</sup>	\$2.00/Watt AC	0.116	0.108	0.104
<b>SOLAR ELECTRIC:</b>				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.202	0.187	0.180
Non-Residential (Grid-Tied) 20 kW or less	\$2.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.202	0.187	0.180
RESIDENTIAL (OFF-GRID)	\$2.00/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.121	0.112	0.108
SOLAR SPACE COOLING <sup>3</sup>	NA	0.129	0.120	0.115
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.057	0.052	0.051
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWH to a maximum of \$1,750.00 <sup>9, 10</sup>	0.057	0.052	0.051
NON-RESIDENTIAL POOL HEATING	NA	0.012	0.011	0.011

## Appendix E

### GreenWatts Certificate of Retirement

(Signed Certificate available upon request)



# CERTIFICATE OF RETIREMENT OF GREENWATTS CREDITS

Original Certificate Issue

Certificate No. TEP/GW: 122,931 – 1,580,285

On January 31, 2010 Tucson Electric Power Company (TEP) retired 1,457,354 kWh of Landfill Gas Credits in meeting its 2009 GreenWatts Program Energy requirements.

4. TEP certifies that it derived the Landfill Credits from application of the Actual Generation of Electricity from the combustion of landfill gas produced at the Los Reales Landfill for the generation of electricity at TEP's Sundt Generating Station.
5. TEP further certifies that, at the time of transfer, it had title to the Landfill Credits and that such Credits have not previously expired, have not been otherwise used by TEP to meet its Environmental Portfolio Standard or Renewable Energy Standard requirements, and have not been transferred by TEP to any other entity.

Attested to:

Name of TEP officer -- David Hutchens

Title -- Vice President, Energy Efficiency and Resource Planning

Date -- January 31, 2010

Signature \_\_\_\_\_

**APPENDIX F**

**Short-term Wholesale Renewable Energy Purchases**

**REDACTED**