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Tucson Electric Power Company

88 East Broadway Blvd., Post Office Box 711
Tucson, Arizona 85702

March 1, 2012

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

Re: Notice of Filing – Tucson Electric Power Company's Annual DSM Progress Report
Docket No. E- 00000~~0~~-12-0068

Pursuant to the Electric Energy Efficiency Standards of the Arizona Administrative Code, Section R14-2-2409.A, Tucson Electric Power Company hereby submits its annual DSM progress report for each of its Commission-approved DSM programs for 2011.

If you have any questions, please contact me at (520) 884-3680.

Sincerely,

Jessica Bryne
Regulatory Services

Enclosure: Report

cc: Barbara Keene, ACC
Compliance Section, ACC

Arizona Corporation Commission

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Tucson Electric Power Company

Annual DSM Progress Report

January – December 2011

Tucson Electric Power Company

DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Tucson Electric Power Company (“TEP” or “Company”), in accordance with Arizona Administrative Code R14-2-2409 (effective January 1, 2011), submits the following Demand-Side Management (“DSM”) progress report. This report includes the following information for all DSM programs that were in place during this reporting period, including programs for residential, non-residential, and low-income customers:

- A brief description of the programs;
- Program modifications;
- Program goals, objectives, and savings targets;
- Levels of participation;
- Description of evaluation and monitoring activities and results;
- kW, kWh, and therm savings;
- Problems encountered and proposed solutions;
- Costs incurred during the reporting period disaggregated by type of cost, such as administrative costs, rebates, and monitoring;
- Findings from all research projects;
- Terminated programs; and
- Other significant information.

A summary detailing all DSM expenses by program is provided in Table 1; energy savings by program are provided in Table 2; cumulative energy savings as a comparison to the Electric Energy Efficiency Standards (“EEES” or “Standard”) are provided in Table 3; societal benefits by program and the performance incentive calculation are provided in Table 4; lifetime environmental savings by program are provided in Table 5; and a summary of participants, year to date expenses, and the yearly budget by program are provided in Table 6. A list of Arizona Corporation Commission (“ACC” or “Commission”) approved DSM programs and measures are attached in Appendix 2.

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Table 1

DSM PROGRAM EXPENSES: JANUARY - DECEMBER 2011

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Residential Programs								
Low-Income Weatherization	\$ 267,891	\$ 18,781	\$ 915	\$ 8,910	\$ 327	\$ 13,008	\$ 3,704	\$ 313,517
Residential New Construction	\$ 302,614	\$ 8,690	\$ 25,786	\$ 508,518	\$ 59,280	\$ 43,559	\$ 7,571	\$ 956,018
Shade Tree Program	\$ 137,665	\$ 811	\$ -	\$ 5,209	\$ -	\$ 6,468	\$ 5,692	\$ 155,844
ENERGY STAR® Lighting (CFL)	\$ 1,510,375	\$ 9,200	\$ 708	\$ 273,785	\$ 19,121	\$ 79,512	\$ 18,838	\$ 1,911,540
Efficient Home Cooling	\$ 564,750	\$ 1,407	\$ -	\$ 75,443	\$ 9,875	\$ 28,432	\$ 5,409	\$ 685,316
Existing Home Program	\$ 231,776	\$ 37,746	\$ -	\$ 780,573	\$ 138,148	\$ 64,777	\$ 20,086	\$ 1,273,105
Res. & Small Comm. Direct Load Control	\$ -	\$ 22,897	\$ -	\$ 609,474	\$ -	\$ 29,548	\$ 33,937	\$ 695,856
Total for Residential Programs	\$ 3,015,072	\$ 99,512	\$ 27,410	\$ 2,261,912	\$ 226,751	\$ 265,302	\$ 95,237	\$ 5,991,196
Support Programs								
Education & Outreach Program	\$ -	\$ 647	\$ 326,177	\$ 124,250	\$ -	\$ 19,565	\$ 938	\$ 471,576
Home Energy Reports (Pilot)	\$ -	\$ 775	\$ -	\$ 242,396	\$ -	\$ 11,049	\$ 65	\$ 254,285
Total for Support Programs	\$ -	\$ 1,422	\$ 326,177	\$ 366,646	\$ -	\$ 30,614	\$ 1,002	\$ 725,861
Commercial Programs								
Non-Residential Existing Facilities	\$ 2,056,139	\$ 5,278	\$ 318	\$ 615,692	\$ 1,249	\$ 120,988	\$ 98,076	\$ 2,897,741
Small Business	\$ 1,031,975	\$ 3,564	\$ -	\$ 571,434	\$ 3,398	\$ 73,523	\$ 74,428	\$ 1,758,322
Efficient Commercial Building Design	\$ 427,969	\$ 838	\$ -	\$ 135,036	\$ 1,203	\$ 24,964	\$ 8,653	\$ 598,661
C&I Direct Load Control	\$ -	\$ 4,433	\$ -	\$ 693,875	\$ -	\$ 47,171	\$ 2,421	\$ 747,900
Total for Commercial Programs	\$ 3,516,082	\$ 14,113	\$ 318	\$ 2,016,037	\$ 5,850	\$ 266,647	\$ 183,578	\$ 6,002,625
Portfolio Totals	\$ 6,531,153	\$ 115,047	\$ 353,905	\$ 4,644,595	\$ 232,601	\$ 562,562	\$ 279,818	\$ 12,719,681

Program Costs	\$ 12,719,681
Program Development, Analysis, & Reporting Software	\$ 513,449
Baseline Study	\$ 13,205
TOTAL	\$ 13,246,335

Definitions

Rebates & Incentives – total amount spent on customer rebates, incentives, and payments made to agencies for installation of low-income weatherization measures.

Training and Technical Assistance – total amount spent on energy efficiency training and technical assistance; for either utility employees or contractors.

Consumer Education – total dollars that are used to support general consumer education about energy efficiency improvements.

Program Implementation – program delivery costs associated with implementing programs, including implementation contractor labor and overhead costs, as well as other direct program delivery costs.

Program Marketing – includes all expenses related to marketing programs and increasing DSM consumer awareness (direct program marketing costs as opposed to general consumer education).

Planning and Administration – costs to plan, develop, and administer programs including management of program budgets, oversight of the request for proposal (“RFP”) process, oversight of implementation contractors, program development, program coordination, and general overhead expenses.

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Measurement, Evaluation, and Research (“MER”) – identification of current baseline efficiency levels and the market potential of DSM measures; process evaluations; verification of installed energy efficient measures; tracking of savings; and identification of additional energy efficiency research.

Program Development, Analysis, and Reporting Software – costs to research and develop new DSM program opportunities, provide analysis of new programs and measures, and develop a database to track and report participation, savings, and benefits. These costs are essential to comply with reporting and rules requirements.

Performance Incentive – share (%) of DSM net economic benefits, capped at either 10% of net benefits or 10% of expenditures, whichever is less. The performance incentive was approved in Commission Decision No. 70628 (December 1, 2008).

Baseline Study – expenditures for a separate TEP Baseline Study approved in Commission Decision No. 71109 (June 5, 2009).

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Table 2

DSM ENERGY SAVINGS: JANUARY – DECEMBER 2011¹

Program	Capacity Savings MW	Annual MWh Savings	Annual Therm Savings	Lifetime MWh Savings	Lifetime Therm Savings
Low-Income Weatherization	0.00	472	5,495	8,261	96,163
Residential New Construction	1.69	1,068	16,569	32,041	497,065
Shade Tree Program	0.00	714	0	21,429	0
ENERGY STAR® Lighting (CFL)	15.24	79,977	0	479,863	0
Efficient Home Cooling	0.54	1,097	0	16,457	0
Existing Home Program	0.55	786	0	9,943	0
Education & Outreach	0.03	412	41,530	3,768	415,300
Non-Residential Existing Facilities	4.57	30,288	0	442,959	0
Small Business	1.66	7,988	0	78,553	0
Efficient Commercial Building Design	1.51	5,122	0	76,837	0
C&I Direct Load Control	11.61	11,615	0	NA	NA
Portfolio Totals	37.39	139,539	63,594	1,170,111	1,008,528

Table 3

CUMULATIVE DSM SAVINGS: JANUARY – DECEMBER 2011

Year	Retail Energy Sales (MWh)	Incremental Annual Energy Savings (MWh)	Cumulative Annual Energy Savings (MWh)	Cumulative Annual Savings as a % of previous year Retail Sales	Cumulative EE Standard
2010	9,291,788				
2011	9,332,107	139,539	139,539	1.50%	1.25%

¹ Capacity savings for C&I Direct Load Control reflect the capacity available for reduction events. Annual MWh savings for C&I Direct Load Control reflect the credit available toward the EE Standard per A.A.C. R14-2-2404 (C).

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Table 4

DSM SOCIETAL BENEFITS & PERFORMANCE INCENTIVE: JANUARY – DECEMBER 2011

DSM Program	Program Cost	Societal Benefits	Societal Costs	Net Benefits
Residential				
Low-Income Weatherization	\$ 313,517	\$ 476,824	\$ 295,628	\$ 181,196
Residential New Construction	\$ 956,018	\$ 6,577,005	\$ 1,260,949	\$ 5,316,056
Shade Tree Program	\$ 155,844	\$ 992,597	\$ 603,337	\$ 389,260
ENERGY STAR® Lighting (CFL)	\$ 1,911,540	\$ 27,391,543	\$ 2,727,778	\$ 24,663,765
Efficient Home Cooling	\$ 685,316	\$ 1,416,703	\$ 2,687,327	\$ (1,270,623)
Existing Home Program	\$ 1,273,105	\$ 1,222,149	\$ 1,782,250	\$ (560,101)
Total for Residential	\$ 5,295,340	\$ 38,076,821	\$ 9,357,269	\$ 28,719,552
Non-Residential				
Non-Residential Existing Facilities	\$ 2,897,741	\$ 28,852,423	\$ 5,941,616	\$ 22,910,807
Small Business	\$ 1,758,322	\$ 4,950,852	\$ 2,865,924	\$ 2,084,928
Efficient Commercial Building Design	\$ 598,661	\$ 5,494,178	\$ 5,217,073	\$ 277,104
Total for Non-Residential	\$ 5,254,725	\$ 39,297,452	\$ 14,024,614	\$ 25,272,839
Support Programs				
Education & Outreach Program	\$ 471,576	\$ 451,492	\$ 532,360	\$ (80,868)
Home Energy Reports (Pilot)	\$ 254,285	\$ -	\$ 254,285	\$ (254,285)
Total for Support Programs	\$ 725,861	\$ 451,492	\$ 786,645	\$ (335,153)
Portfolio Totals				
Portfolio Totals	\$ 11,275,926	\$ 77,825,765	\$ 24,168,527	\$ 53,657,238
Program Development, Analysis & Reporting Software	\$ 513,449	\$ -	\$ 513,449	\$ (513,449)
Baseline Study	\$ 13,205	\$ -	\$ 13,205	\$ (13,205)
TOTAL	\$ 11,802,580	\$ 77,825,765	\$ 24,695,181	\$ 53,130,585
Performance Incentive Calculation:				
Total Spending / Total Net Benefits ^a	\$ 11,017,486			\$ 53,030,256
10% of Spending / Net Benefits	\$ 1,101,749			\$ 5,303,026
Performance Incentive for 2011	\$ 1,101,749			

a. Total spending and net benefits do not include Low-Income Weatherization, Education & Outreach, or Demand Response/Direct Load Control Programs per Commission Decision No. 70628 (December 1, 2008), which approved the TEP Performance incentive calculation. The Performance Incentive allowed is capped at 10% of Net Benefits or 10% of total spending, whichever is less.

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Table 5

DSM LIFETIME ENVIRONMENTAL SAVINGS: JANUARY – DECEMBER 2011

Program	Lifetime SO _x Reduction (lbs)	Lifetime NO _x Reduction (lbs)	Lifetime CO ₂ Reduction (lbs)	Lifetime Water Reduction (gallons)
Low-Income Weatherization	17,788	21,463	16,953,682	3,800,233
Residential New Construction	68,991	83,243	67,217,935	14,738,894
Shade Tree Program	46,141	55,672	41,032,093	9,857,251
ENERGY STAR® Lighting (CFL)	1,033,240	1,246,683	918,845,973	220,736,860
Efficient Home Cooling	35,436	42,756	31,512,878	7,570,424
Existing Home Program	21,409	25,831	19,038,287	4,573,619
Education & Outreach	8,114	9,790	12,116,113	1,733,416
Non-Residential Existing Facilities	953,780	1,150,808	848,182,566	203,761,198
Small Business	169,139	204,080	150,413,301	36,134,195
Efficient Commercial Building Design	165,445	199,622	147,127,651	35,344,875
Portfolio Totals	2,519,483	3,039,948	2,252,440,478	538,250,966

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Table 6

DSM SUMMARY OF PARTICIPATION AND EXPENSES: JANUARY – DECEMBER 2011²

DSM Program	Participants	# Measures	Expenses YTD	2011 Budget
Residential Programs				
Low-Income Weatherization	157	157	\$ 313,517	\$ 408,284
Residential New Construction	604	604	\$ 956,018	\$ 3,901,465
Shade Tree Program	1,576	3,839	\$ 155,844	\$ 164,800
ENERGY STAR® Lighting (CFL)	NA	1,301,312	\$ 1,911,540	\$ 1,581,507
Efficient Home Cooling	2,210	2,418	\$ 685,316	\$ 546,364
Existing Home Program	780	947	\$ 1,273,105	\$ 999,070
Res. & Small Comm. Direct Load Control	523	NA	\$ 695,856	\$ 1,090,950
Total for Residential Programs	5,850	1,309,277	\$ 5,991,196	\$ 8,692,440
Support Programs				
Education & Outreach Program	37,388	1,933	\$ 471,576	\$ 526,206
Home Energy Reports (Pilot)	25,000	NA	\$ 254,285	\$ 382,145
Total for Support Programs	62,388	1,933	\$ 725,861	\$ 908,351
Commercial Programs				
Non-Residential Existing Facilities	83	52,068	\$ 2,897,741	\$ 2,180,237
Small Business	179	26,605	\$ 1,758,322	\$ 2,180,237
Efficient Commercial Building Design	15	22	\$ 598,661	\$ 218,545
C&I Direct Load Control	34	NA	\$ 747,900	\$ 824,000
Total for Commercial Programs	311	78,695	\$ 6,002,625	\$ 5,403,019
Portfolio Totals	68,549	1,389,905	\$ 12,719,681	\$ 15,003,810

² TEP provides this table to comply with A.A.C. R-14-2-2409 (B)

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LOW-INCOME WEATHERIZATION PROGRAM

Description

The TEP Low-Income Weatherization ("LIW") Program is designed to improve the energy efficiency of homes for customers whose income falls within the defined federal poverty guidelines. Steps taken in the LIW Program will reduce gas and electric bills for eligible customers and improve their comfort and quality of life. Energy savings realized from the LIW Program will allow low-income customers to better utilize the limited income they receive for other necessary items such as rent, food, or medical expenses.

Program Modifications

There have been no Program modifications since TEP's last reporting period.

Program Goals, Objectives, and Savings Targets

The objectives of the Program are to:

- Increase the number of homes weatherized each year;
- Reduce average household utility bills by utilizing energy conservation measures in the Weatherization Assistance Program rules; and
- Improve the quality of life for the customers by providing them with a safe and healthy home.

The 2011 goal was to weatherize 250 homes.

Levels of Participation

A total of 157 households received weatherization assistance during this reporting period.

Evaluation and Monitoring Activities and Results

The Governor's Office of Energy Policy ("GOEP"), formally known as The Arizona Energy Office ("AEO"), with billing data from TEP and other Arizona gas and electric utilities, is analyzing and tracking energy use in weatherized homes statewide. As their database grows, a more accurate analysis of the impact of weatherization activities will emerge. TEP will report energy savings from weatherization activities based upon the most recent GOEP report. The GOEP does not report any kW demand savings. The report is attached in Appendix 1.

The January 2012 AEO report is summarized below:

Utility Bill Analysis

- To date, an analysis of 275 homes has been completed on homes utilizing Arizona Public Service Company ("APS"), TEP, UNS Gas, Inc., UNS Electric, Inc., and Southwest Gas Corporation utility data. This analysis is ongoing, and new data will be updated to these values on a quarterly basis.
- Savings to Investment Ratios ("SIR") are provided for total investment from all funding spent (diagnostics, energy measures, health and safety measures) and for energy related measures only (diagnostics and energy measures).
- Present value is based on 17.5 years measure life, discount rate of 3% and a utility cost escalation rate of 1%.

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- The combined SIR of all jobs reviewed to date for funds spent on diagnostics, energy measures and health and safety measures was 1.21. Health and saving represented 16% of expenditures.
- The combined SIR of all jobs reviewed to date for funds spent on energy measures and diagnostics was 1.38.
- The average saving per home reviewed was 2,746 kWh and 35 therms of natural gas (gas therms average includes all electric homes).

kW, kWh, and Therm Savings

The savings for this reporting period are listed below:

No. of Homes	kW savings	kWh savings	Therm savings
157	0	472,079	5,495

Savings are adjusted for line losses of 9.5% for both demand and energy (excluding therms).

Problems Encountered and Proposed Solutions

There were no significant problems encountered during this reporting period.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives ^a	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Low Income Weatherization	\$ 267,891	\$ 18,761	\$ 915	\$ 8,910	\$ 327	\$ 13,008	\$ 3,704	\$ 313,517

a. Includes \$14,596 for health and safety related repairs and \$8,945 for Weatherization Agencies administrative expenses.

Findings from All Research Projects

No research projects were performed during this reporting period.

Other Significant Information

The Agencies did not utilize their entire budget in the second half of the year. Conversations with both Agencies provided a similar explanation – both are trying to maximize their remaining ARRA funding. Additionally, due to the narrow scope of energy efficient measures that can be utilized in this demographic area it is difficult at times for them to use TEP funding. Tucson Urban League used most of their funds on energy efficiency measures; thus a small percentage of expenses were for health and safety measures. Pima County dramatically reduced their health and safety expenditures in the second half of 2011; they nevertheless slightly overspent their 25% allocation. TEP will continue to work closely with both agencies along with the GOEP on strategies to find additional energy efficiency measures that can be used to better maximize the number of homes being weatherized.

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RESIDENTIAL NEW CONSTRUCTION

Description

The Residential New Construction Program for TEP is marketed as the Guarantee Home Program. It is a utility sponsored, energy efficient new home construction program based on a foundation of integrated building science. The Program emphasizes the whole-house approach to improving health, safety, comfort, durability, and energy efficiency. The Program includes on-site inspections and field testing of homes to verify that homes actually perform the way they were designed. Program standards are designed to focus solely on best case practice. Components of the Guarantee Home Program include development of energy efficient construction standards, branding, builder training curriculum, and marketing collateral.

Commission Decision No. 71638 (April 14, 2010) approved TEP's Pilot Zero-Net Energy Homes Program. This Program is an enhancement of the existing Guarantee Home Program. The tiered incentive structure will help promote increased levels of efficiency in new home construction.

Program Modifications

To increase cost efficiency of program delivery, inspections of Program homes will be conducted by the independent RESNET® home energy rater network.

Program Goals, Objectives, and Savings Targets

The objectives of the Program are to:

- Reduce peak demand and overall energy consumption (electric) in new homes;
- Implement programs that include more aggressive energy efficiency standards that produce savings of at least 20 percent above baseline (HERS 70) and a near zero-net percentage of at least 50 percent (HERS 45);
- Stimulate the installation of solar photovoltaic systems and solar water heaters in new homes;
- Stimulate construction of new homes that are inspected and tested to assure energy performance;
- Stimulate the installation of high efficiency heating and cooling systems, envelope, lighting, and fixed appliances (Energy Star® products);
- Assist sales agents with promoting and selling of zero-net energy homes;
- Train builder construction staff and sub-contractors in advanced building-science concepts to reach zero-net energy goals through improved design and installation practices, and through the installation of renewable energy devices;
- Increase homebuyer awareness and understanding of the benefits they receive from living in a zero-net energy home and how they can improve the performance of their home;
- Educate builders who: 1) are not familiar with energy savings and on-site generation potential; 2) may be uncertain about zero-net energy performance; and 3) may be concerned about high initial costs for construction measures.

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Goals for 2011:

Tier Group by HERS	Target Goal: Number of Homes
Tier I < 85 HERS	300
Tier II < 70 HERS	600
Tier III < 45 HERS	150

Levels of Participation

A total of 604 homes were completed to Program standards during this reporting period. 57 homes completed Tier II level. Meritage Homes, Pulte Homes, and Pepper-Viner Homes became the first builders to participate in the Zero-Net Energy Homes Pilot. 14 Tier III homes were completed in this reporting period.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 130% for non-coincident demand savings and 97% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

Tier	No. of Homes	kW savings	kWh savings	Therm savings
1	533	1,325	870,315	14,825
2	57	266	152,931	1,744
3	14	97	44,790	0
Totals	604	1,687	1,068,036	16,569

Savings are adjusted for line losses of 9.5% for both demand and energy (excluding therms).

Problems Encountered and Proposed Solutions

Pima County new homes sales remain very slow; the new home sales volume was the lowest in Tucson since 1967. Foreclosed homes exceeded new home sales by a factor of four to one. The proposed solution is to have every new home be energy efficient and to leverage the higher levels of efficiency as a way for builders to differentiate their product from the foreclosed homes.

2011 represented a year of transition; EPA's Energy Star[®] version 3.0 will begin in 2012. Energy Star[®] version 3.0 includes significant changes for the homebuilder and their subcontractors. Meetings and training sessions with builder's representatives and their subcontractors helped prepare area homebuilders for the new Energy Star[®] version.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Residential New Construction	\$ 302,614	\$ 8,690	\$ 25,786	\$ 508,518	\$ 59,280	\$ 43,559	\$ 7,571	\$ 956,018

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Findings from All Research Projects

No research projects were undertaken during this reporting period.

Other Significant Information

In order to help establish a vibrant Home Energy Rating System marketplace in Southern Arizona, TEP stopped providing ratings December 31, 2011. The transition of inspections on Program homes being conducted by the independent RESNET[®] home energy rater network has been substantially completed.

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EDUCATION AND OUTREACH PROGRAMS

TEP currently offers educational programs targeting both residential and commercial customers. TEP also offers an Academic Education Program for use in scholastic settings.

RESIDENTIAL AND COMMERCIAL EDUCATION

Description

TEP's residential and commercial education program is designed to educate customers on energy use and assist them with energy savings suggestions. TEP's primary tool for energy savings suggestions is the online Energy Advisor which provides the customer with more than 140 energy savings recommendations or measures and can be personalized for weather and utility rates based on the customer's zip code. TEP promotes the Energy Advisor online audit through a variety of advertising promotions such as bill inserts, web advertising, and radio advertising. Also included is educational information on TEP's PowerShift™ Time-of-Use ("TOU") rates.

Program Modifications

TEP market existing customer and academic education programs, including the Energy Advisor and TOU awareness using the venues listed below:

- Bill inserts and messages;
- Brochures;
- Paid web advertising;
- In-house advertising on tep.com;
- Media Q&A, newspaper and radio ads;
- Tradeshow/Community events and premium giveaways; and
- Call Center training.

An additional approach to outreach has been undertaken on a small scale. In collaboration with two local organizations, the Metropolitan Energy Commission ("MEC") and the Sonora Environmental Research Institute ("SERI"), TEP sponsored two eight-hour train-the-trainer sessions with volunteers and staff. These newly trained energy coaches have conducted 29 conservation workshops including hands on training and sample kits containing energy efficiency items to be used at home. The workshop was also presented to a group of utility employees. Energy savings based on the kits provided to customers are reported in the *All Education and Outreach Programs* subsection below. Pending Commission approval of TEP's 2011-2012 Implementation Plan and its Behavioral Comprehensive Program, this early work will expedite roll out of the Community Education portion of that program.

Program Goals, Objectives, and Savings Targets

The Program is designed to educate commercial and residential customers on ways to save energy through conservation measures or utilizing TOU rates.

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Levels of Participation

Energy Advisor

For calendar year 2011 4,230 residential customers and 398 commercial customers accessed the online Energy Advisor, with 1,799 residential customers and 50 commercial customers completing an online energy audit. TEP continues to advertise the Energy Advisor along with other Programs within the Bright Solutions Family Campaign.

PowerShift™ TOU Customer Participation

202 on Rate 70NB
651 on Rate 70NC
578 on Rate 70ND
58 on Rate 201BN
15 on Rate 201CN

Other Residential TOU Customer Participation

2,411 on Rate 21 (frozen)
4,110 on Rate 70 (frozen)
495 on Rate 201B (frozen)
163 on Rate 201C (frozen)

Problems Encountered and Proposed Solutions

No problems were encountered during this reporting period.

ACADEMIC EDUCATION

Description

TEP offers school education programs that cover a variety of topics related to energy, natural resource conservation, and environmental awareness. These programs are offered to classes ranging from kindergarten through 8th grade. TEP provides age-appropriate curriculum with accompanying teachers' guides about electricity, energy efficiency, conservation and renewable energy. TEP's Academic Education Program features four programs in particular, including: the Insulation Station (for use in 4th grade); Energy Patrol (for use in any elementary school); Bright Students: The Conservation Generation, formerly called "Energy Conservation Bike/Solar Generation Presentations" (for use in middle school); and the Electri-City Exhibit (for use in kindergarten through 3rd grade).

The Energy Patrol is an AEO-sponsored program for elementary school teachers and students approved by the Commission in March 1993. Students monitor classrooms to ensure that lights, computers, and water faucets are turned off when rooms are vacant. The program is designed to help schools reduce energy costs and to teach students and their families how to conserve energy.

The Electri-City Exhibit at the Tucson Children's Museum is designed to teach very young children (K-3) about saving energy, as well as electrical safety. TEP also underwrites tours for schools in low-income areas, provides age-appropriate materials to students, and trains docents to augment the presentation, which includes hands-on activities illustrating the energy saving lessons.

The Insulation Station (a program for 4th graders) was approved by the Commission in March 1993. The Insulation Station is a hands-on learning kit containing ready-to-assemble model houses and the necessary

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supplies to conduct science and math activities on insulation and home energy efficiency. Materials provided are model home kits and student workbooks containing charts, graphs, activities, and a home energy audit. TEP requires 4th grade teachers to attend a training session prior to receiving materials.

The ***Bright Students: The Conservation Generation Program***: During TEP's energy conservation bike presentations, students use the Energy Bike to generate enough electricity to light a light bulb, run a fan or heat up a hair dryer. They compare the amount of energy needed to light incandescent, CFL, and LED light bulbs, and learn about solar energy. Students explore ways they can help conserve energy at home and at school.

These classroom presentations about Energy Conservation are 50-60 minutes in length and include a pre-visit lesson and post-visit activity; all are aligned with the Arizona Department of Education middle school science standards. A pledge card sent home for parental approval allows students to receive a kit of efficiency items they can use at home for practical experience with the curriculum presented at school.

Program Modifications

The *Electri-City* school tour has been expanded to incorporate information about renewable energy, specifically solar energy. Solar panels have been installed on the Tucson Children's Museum playhouse, and a panel to operate small appliances has been added to the curriculum presented to children by the Museum docents, and to the teacher's guide provided to each teacher prior to the tour. The Energy Bike presentation now called *Bright Students: The Conservation Generation* has benefited from a curriculum update and the addition of energy saving take home kits. The kit is given to students whose parents agree to let them receive it and help the student in using the kit items at home.

Program Goals, Objectives, and Savings Targets

These programs are all designed to educate students and their families on ways to save energy and to provide hands-on experiences by encouraging students to test the energy saving options provided to them in their own home.

Levels of Participation

The table below includes participation for the first six months of 2011, which reflects what we have learned from experience that most teachers order their materials, receive their trainings, and plan their special events during the fall of the previous year. TEP offers teacher trainings and distributes classroom materials.

Program	Number of Schools	Number of Students
Insulation Station*	17 schools/ 32 teachers trained	966
Energy Patrol	7 new schools	4,500 est.
Energy Conservation/ Environmental classroom materials	138 schools/ 255 teachers	19,707
Energy Efficiency Exhibit (TEP's Electri-City at the Tucson Children's Museum)**	31schools 253 Adults	1518***

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Energy Conservation Bike / Solar Generation	45 schools 150 Teachers	4,136
TOTAL	238 schools	30,827

**Numbers refer to teachers trained and kits ordered for students.*

***Student numbers are those from "low-income" schools for whom TEP paid the entrance fee and bus transportation costs for guided tours of the Electri-City Exhibit. They do not reflect total Museum visitors to the site.*

****Tucson Children's Museum tours during summer months are ordinarily small scout troops & summer programs (6-8 children) representing schools.*

The Energy Conservation classroom presentation for middle schools that featured the Energy Bike continued to grow in popularity, and the addition of the home efficiency kit component maintained funding and a continued substantial level of presentations. During the second half of 2011 Environmental Education Exchange presented a total of 101 TEP Energy Bike Presentation, teaching approximately 2646 students and 48 teachers in 21 schools. During the first half of 2011, Environmental Education Exchange presented a total of 102 TEP Energy Bike presentations, teaching approximately 2,741 students in 24 schools. These included 1,654 6th graders; 261 7th graders; and 673 8th graders; as well as 153 "others" (classes of mixed grades).

The Energy Bike team also made 10 community presentations at community events:

- Marana High School Family Academy Night;
- The Festival of Books at the University of Arizona campus (2 days);
- Future Innovator's Night during the Southern Arizona Regional Science and Engineering Fair week;
- Boxer Expo at Vail Academy and High School;
- Solar Rock at Armory Park;
- City of Tucson's Earth Day at Reid Park;
- Pima Community College (Northwest Campus location) Earth Day;
- Tucson Children's Museum Earth Day;
- Raytheon's Math, Science the Technology Funfest (3 days);
- University of Arizona Earth Day Event;
- 2-day Bio-Blitz – at Saguaro National Park, sponsored by National Geographic;
- Pima Community College (north campus) Earth Day;
- Various elementary school fairs (Health and Wellness, Earth Day, Science, STEM, ect.);
- Science and Math FunFest – two days at the Tucson Convention Center;
- Future Innovator's Night – with the So AZ Regional Science and Engineering Fair (SARSEF);
- Solar Rock;
- UA Earth Day Celebration;

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- Earth Day Festival;
- Tucson Children's Museum Energy/Solar Day; and
- Davis Monthan AFB Energy Action Day.

ALL EDUCATION & OUTREACH PROGRAMS

Evaluation and Monitoring Activities and Results

Evaluation and monitoring is just beginning for energy savings for TEP's current Education and Outreach Program. TEP has included new programs encompassing more significant neighborhood outreach, direct education, installation of energy saving items, and programs that affect consumer behavior in its 2011-2012 Implementation Plan. These expanded Programs are designed to allow for measurement and evaluation of energy savings.

Navigant Consulting performed an evaluation of the take-home energy kits for 2011. The evaluation resulted in a realization rate of 123% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

Savings attributable to the take-home efficiency kits are as follows:

No. of Kits Distributed	kW savings	kWh savings	Therm savings
1,933	28	411,818	41,530

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Education & Outreach	\$ -	\$ 647	\$ 326,177	\$ 124,250	\$ -	\$ 19,565	\$ 938	\$ 471,576

Findings from All Research Projects

No research projects were performed during this reporting period.

Other Significant Information

The 2011-2012 TEP Implementation Plan includes the revised K-12 program focused on energy conservation and how to apply these concepts at home. Development of a revised K-12 curriculum took place in the second half of 2011.

Other new programs in the newly filed Behavioral Comprehensive portfolio include Home Energy Reports which began going to customers in October of this reporting period, Community Education, CFL give-away and direct neighborhood canvassing.

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SHADE TREE PROGRAM

Description

The TEP Shade Tree Program has been in operation since December 1992. Desert-adapted trees are provided to individual residences, residential neighborhoods, low-income families, as well as to community areas, and schools through TEP's partnership with Tucson Clean and Beautiful ("TCB"). Residents are allowed two, 5-gallon trees per year (four trees are allotted to homes built before 1980), which must be planted on the south, west, or east side of the home. Residents complete an application provided by TCB either online or by mail which includes the type of tree requested and the location where it will be planted. The resident pays a nominal fee of \$8.00 per tree, and the tree will be delivered to their home by TCB.

Program Modifications

No modifications were made during this reporting period.

Program Goals, Objectives, and Savings Targets

The objective of the Program is to promote energy conservation and the environmental benefits associated with planting low water use trees. Along with the energy savings trees provide to the homes, trees also provide habitat for wildlife, absorb air and water pollutants, and control storm water runoff and soil erosion, in addition to the aesthetic beauty they provide to neighborhoods and the community.

Program goals for 2011:

No. Trees Planted	4,000
kWh savings	708,000

Levels of Participation

For this reporting period, TCB delivered a total of 3,839 trees as follows:

- 3,592 five-gallon trees were distributed to approximately 1823 residential customers;
- 75 fifteen gallon trees and 11 five-gallon trees to sixteen schools;
- 58 five-gallon trees and 103 fifteen-gallon trees were delivered to eleven community projects.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 96% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

No. of Trees	kW savings	kWh savings	Therm savings
3,839	0	714,294	0

Savings are adjusted for line losses of 9.5% for both demand and energy.

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Problems Encountered and Proposed Solutions

TCB had a personnel change when their field person resigned mid-year. This change caused a slight disruption in deliveries while the new field person came up to speed and is the primary reason fewer trees were delivered. They also had higher than expected requests for both school and community projects, quite possibly due to tree deaths from the freeze that occurred at the beginning of 2011.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Shade Tree	\$ 137,665	\$ 811	\$ -	\$ 5,209	\$ -	\$ 6,466	\$ 5,692	\$ 155,844

Findings from All Research Projects

No research projects were conducted during this reporting period.

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EXISTING HOMES RETROFIT AND RESIDENTIAL ENERGY ASSESSMENT PROGRAM

Description

The TEP Existing Homes Retrofit Program is designed to encourage homeowners to increase the energy efficiency of their homes. The Program provides incentives for high-efficiency heating, ventilation and air conditioning ("HVAC") equipment; along with home performance services such as sealing leaky duct work, installing insulation, air sealing, and other thermal envelope improvements in existing homes. The Program provides direct incentives to participating contractors with the requirement that the incentives are passed on to utility customers as a line item credit toward approved Program measures. To access incentives TEP requires customers to utilize Program participating contractors who are required to be Building Performance Institute ("BPI") certified and complete Program administrative training including field mentoring.

The Residential Energy Assessment Program ("REAP") is an integral component of the Existing Homes Retrofit Program. The major components of the REAP include a home energy assessment (or "audit"); a general appliance assessment; installation of up to ten compact fluorescent lamps ("CFLs") and one Advanced Power Strip per home. Education regarding behavioral changes as well as other TEP efficiency programs, rate options, and contact information to assist with questions are provided during the assessment. The assessment will also provide the homeowner with information regarding possible energy savings by participating in the components of the Existing Homes Retrofit Program, as described above.

The Existing Home Retrofit Program was approved in Commission Decision No. 72028 (December 10, 2010), and the Residential Energy Assessment Program was approved in Commission Decision No. 70263 (January 6, 2011). While contained in separate decisions, the programs are designed to complement each other and are administered and reported as a single program. The Program will be marketed as the BrightSave Home Program, and replaces the previous Efficient Home Cooling Program.

TEP conducted an RFP process to select an Implementation Contractor ("IC") and Conservation Services Group ("CSG") was the successful bidder.

Program Modifications

Upon the initial public launch of the REAP in May 2011 several new homes, including some very large homes (one listed at 31,000 square feet), requested audits. In response new Program participation qualifications were instituted with the goal of reducing the number of audits being performed where little efficiency could be gained and/or the home size exceeded the programs economic model & technical parameters. The additional qualifications added are as follows:

- Homes must be constructed in or prior to 2005 to avoid testing the most energy efficient homes in the service territory. Homes built after 2005 may still be eligible for a REAP audit when referred as a "high bill" customer that may be experiencing atypical energy use due to acute design, equipment, or other issues.
- Homes may not exceed 3,500 square feet in conditioned floor area. This size designation was established to align with the Program's economic model which affords each audit be performed by a single auditor in a half-day increment. Homes over 3,500 square feet require either a full day to audit and/or multiple auditors to staff, significantly increasing the cost of the audit and significantly reducing the cost effectiveness. An additional technical consideration with some very large homes is that their HVAC systems often utilize commercial equipment outside the expertise of residentially trained technicians.

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- Program contractors have requested the ability to administer energy assessments directly to their own customers versus referring them to the utility audit team. Recognizing the market penetration gained by the contractor-auditor model used in the UNS Gas and APS shared service territory TEP initiated a mentoring pilot in the 4th quarter of 2011 to train contractors to provide in-home assessments. This effort will have the added benefit of enabling contractors to utilize their own resources to offer assessments to homes larger than 3,500 square feet without adversely impacting program resources. Home energy assessments completed by Program contractors will meet all program standards and be subject to QA review by Program staff; approved audits will qualify for the programs flat \$200 per dwelling fee.

The following modifications and additions to incentivized retrofit measures have also been instituted:

- HVAC Early Retirement incentive qualification has been modified to include existing systems rated at 10.0 SEER or less (previously had to be less than 10 SEER);
- Air Sealing and Insulation credit for installing vertical insulation in the thermal plane of insulated attic spaces including knee-walls and skylight shafts;
- A \$250 A/C upgrade incentive for swamp cooler replacements based solely on the new equipment meeting minimum Energy Star efficiency standards. The technical justification is identical to the existing ROB incentive designed to motivate customers to install more efficient equipment than currently required by code where other factors have already motivated them to install a new A/C unit; and
- Expanding solar shade screen and window film incentives to exposed easterly facing glazing.

TEP officially ended the Residential Efficient Home Cooling Program May 1, 2011. The contractors were given until May 31, 2011 to complete scheduled jobs and to submit all required paperwork for the participant rebates.

Program Goals, Objectives, and Savings Targets

The objectives of the Existing Homes Retrofit component of the Program are as follows:

- The proper sizing and quality installation of high efficiency HVAC equipment, sealing leaky ductwork, and installation of thermal envelope measures;
- Advance the building science skills of participating contractors leading to BPI certification; and
- Achieving designation as a Home Performance with Energy Star participating program.

The objectives of the Energy Assessment component of the Program are as follows:

- Assess how much energy a home is using and what measures can be taken to improve efficiency;
- Install up to ten (10) CFL's and one energy saving power strip; and
- Educate homeowners about applicable TEP rebates and simple behavioral modifications to increase energy efficiency.

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The 2011 program goals are:

Retrofit Measure	Goal
HVAC Replace on Burnout with Quality Install and Duct Sealing- Prescriptive	300
HVAC Replace on Burnout with Quality Install and Duct Sealing- Performance	100
HVAC Early Retirement with Quality Install and Duct Sealing- Prescriptive	200
HVAC Early Retirement with Quality Install and Duct Sealing- Performance	50
Duct Sealing- Prescriptive	300
Duct Sealing- Performance	200
Air Sealing	100
Air Sealing and Attic Insulation	100
Solar Shade Screens/Window Film	300

Energy Assessment Measure	Goal
Audits	1,000
Direct install- CFL	10,000
Direct install- Power strip	1,000

Levels of Participation

For this reporting period, TEP paid rebates on 2,418 HVAC retrofits under the previous Efficient Home Cooling Program. 22 contractors were recruited into the BrightSave Home Program; 12 have achieved the BPI certification of participating staff. 780 customers participated in the BrightSave Home Program for a total of 950 measures, of which 531 were audits. Of the 531 customers that had audits performed, 30 had additional measures installed.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 100% for both demand and energy savings for Efficient Home Cooling, and a realization rate of 97% for non-coincident demand and 89% for energy savings for BrightSave Home. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Saving

Efficient Home Cooling

No. of Units Installed	kW savings	kWh savings	Therm savings
2,418	541	1,097,163	0

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BrightSave Home

Measure	Units	kW Savings	kWh Savings
Air Sealing	34	18	28,374
Duct Testing & Repair	76	54	46,555
Early Retirement	144	397	302,916
Replace on Burnout	60	66	63,436
Shade Screens	105	28	36,658
Energy Audits	531	40	317,115
Totals	950	603	795,054

Savings are adjusted for line losses of 9.5% for both demand and energy.

Problems Encountered and Proposed Solutions

The use of CSG's sophisticated Energy Measures software to refine energy saving estimates and performance testing has introduced an adaptation period during which refinements to conform to Program requirements and regional climate are ongoing. Efforts to calibrate the software's energy saving calculation models and derive customized savings reporting tables persisted through the end of 2011.

Costs Incurred

Costs incurred for this Program during the reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation *	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Efficient Home Cooling	\$ 564,750	\$ 1,407	-	\$ 75,443	\$ 9,875	\$ 28,432	\$ 5,409	\$ 685,316

a. Includes \$64,810 paid to KEMA, the IC for processing rebates.

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation *	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Existing Home Program	\$ 231,776	\$ 37,746	-	\$ 780,573	\$ 138,148	\$ 64,777	\$ 20,086	\$ 1,273,105

a. Includes \$373,129 paid to CSG, the IC.

Findings from All Research Projects

No research projects were conducted during this reporting period.

Other Significant Information

The timeline of key events during Program planning and launch is as follows:

November 2010	Final Implementation Contractor interviews conducted
December 2010	Letter of Intent issued to Conservation Services Group awarding contract as program implementation contractor
January 2011	Program staff hiring, BPI training and field certification
March 2011	REAP software, CSG's Energy Measure Home, completes UniSource Information Services and Security technical screening

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March 2011	Program Launch for Contractors
April 2011	First TEP Contractor BPI Training
May 2011	Phase in of BrightSave Home incentives, phase out of Efficient Home Cooling Program incentives
May 23, 2011	Official media launch of REAP audits
June 2011	Efficient Heating and Cooling Program officially closed
July 2011	Home Assessment Program application submitted to EPA for Home Performance with Energy Star status.
November 2011	Energy Star application approved by EPA pending transfer and verification by DOE, (the Energy Star brand, transitions, from EPA to DOE control January, 2012.)
November 2011	Launch of pilot home assessment training for program contractors.

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ENERGY STAR® LIGHTING PROGRAM

Description

The TEP ENERGY STAR® Compact Fluorescent Lamp (“CFL”) Buy-down Program promotes the installation of energy efficient ENERGY STAR® approved lighting products by residential and small commercial customers in the TEP service territory. TEP provides funds to manufacturers of ENERGY STAR® approved CFL products to reduce the cost of CFLs. TEP then partners with local retailers to pass on these savings to the consumer.

Program Modifications

There have no Program modifications this reporting period.

Program Goals, Objectives, and Savings Targets

The program objectives are to:

- Reduce peak demand and overall energy consumption in homes and small businesses;
- Increase the purchase of CFLs;
- Increase the availability of energy efficient lighting products in the marketplace; and
- Increase the awareness and knowledge of retailers and TEP customers on the benefits of energy efficient lighting products.

Sales, demand, and energy savings goals for 2011:

Projected Lamp sales	1,139,320
Peak Demand Savings (kW)	5,814
Energy Savings (kWh)	64,067,811

Levels of Participation

A total of 1,301,312 CFLs were sold during this reporting period, which was 114% of goal. CFL sales by wattage are listed in Appendix 3.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 100% for both demand and energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

No. of CFLs Sold	kW savings	kWh savings	Therm savings
1,301,312	15,238	79,977,123	0

Savings are adjusted for line losses of 9.5% for both demand and energy.

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Problems Encountered and Proposed Solutions

As the Program matures, more people have used CFL bulbs for a longer period of time. Program representatives are beginning to hear some complaints on the longevity of the bulbs versus manufacturers stated expectations. This is occurring across the country. TEP is advising customers that some behaviors, such as frequent switching on and off of bulbs, may affect their expected life. Information from the ENERGY STAR® Lighting Partners Conference in the fall of 2011 indicates that manufacturers and ENERGY STAR® are working to improve the longevity of bulbs and to provide more accurate estimates of lifespan for their products. TEP continues to receive repeated requests for information on LED bulbs. Inclusion of some LED lamps in the 2011-2012 Implementation Plan was not recommended for approval by Commission Staff. This was primarily due to the high cost of LED lamps and the resulting high incentive per lamp suggested by TEP. TEP will continue to monitor this technology, and propose it as a DSM measure again if prices come down enough to warrant its inclusion.

A potential problem is the availability of rare earth minerals. CFL bulbs require these minerals to operate. Reduced availability has resulted in an increase in the price of CFL bulbs, which could negatively impact sales. A possible solution is to increase incentives to lower the price of the bulbs to consumers. TEP will continue to monitor the impact of the price increases on sales and adjust the program policies or incentives as needed.

There is confusion in the marketplace regarding the Energy Independence and Security Act ("EISA") and the resulting changes in incandescent bulbs that will meet the new efficiency standards. Customers and retail employees do not have a good understanding of the changes that are about to take place. TEP has been conducting training sessions for employees while at retail stores. In addition, a marketing piece has been developed that explains the phase out as mandated by the federal government. These are being handed out during store events. A surge in purchases of incandescent 100 Watt light bulbs occurred towards the end of the reporting period. This was likely an effect of customers trying to stock up in advance of EISA rules while standard bulbs are still available.

Costs Incurred

Costs incurred for this Program during the reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation *	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
ENERGY STAR® Lighting (CFL)	\$ 1,510,375	\$ 9,200	\$ 708	\$ 273,785	\$ 19,121	\$ 79,512	\$ 18,838	\$ 1,911,540

Includes \$254,657 paid to ECOVA, the IC.

Findings from All Research Projects

No research projects were conducted during this reporting period.

Other Significant Information

TEP has found that retailer visits are playing a critical role toward the success of the Program. Visits focus on proper Program information and signage; ensuring product is displayed prominently; checking product inventory; and training staff on the benefits of Program participation. TEP performed 1,067 store visits during this reporting period. In addition, TEP held 172 aisle training events for retail employees.

TEP performed 55 week-end outreach events at various retailers during this reporting period. Outreach events consist of one or more TEP representatives promoting various CFL products and using a CFL lighting display to help educate customers. Outreach events typically last four hours. Retailers are very appreciative of this type of outreach to their customers and always encourage repeat events at their store.

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Marketing efforts for this reporting period include:

- The Program was promoted at 44 speaking events during this reporting period;
- TEP has a bulb display showing incandescent vs. CFL bulbs. Customers can see the difference in energy used, brightness and colorization. A dimmable fixture and an LED were added to the display. This display is used at in-store outreach events, schools, and other events where TEP is exhibiting;
- The bulb application guide was displayed at participating retail stores to help customers select the correct bulb for the correct application. The guide was modeled after the ENERGY STAR[®] guide;
- A bill insert was sent to over 320,000 TEP customers in their June/July bill;
- In support of Earth Day, ads promoting the benefits of CFL bulbs were placed in the Tucson area newspaper for five days;
- No calls were made to the 800 number during this reporting period;
- There were 3,406 hits on the web site for this Program. Of these, 2,058 went to the retail locator site to find out where to buy CFL bulbs. The website includes a calendar of events and a retailer locator page; and
- A new marketing piece has been developed that explains the EISA standards and the changes being made to increase efficiency of incandescent bulbs.

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HOME ENERGY REPORTS PILOT PROGRAM

Description

The TEP Home Energy Reports Pilot Program utilizes reports designed to instigate behavioral changes in customers' energy consumption. The Program works by (1) making customers aware of their energy consumption. (2) Allowing them to compare that usage to similarly situated homes; and (3) providing tailored energy savings tips in each report. The concept is simple: once customers are able to compare their usage to similarly situated homes, sociological instincts take over and customers are induced to use less energy.

Program Modifications

There have no Program modifications this reporting period.

Program Goals, Objectives, and Savings Targets

The Home Energy Reports Program is designed to affect: (1) habitual behaviors like turning off the lights or adjusting the thermostat; (2) purchasing behaviors such as buying efficient light bulbs and appliances; and (3) the behavior of participating in utility demand side management ("DSM") programs by preparing reports that compare a customer's energy use to that of neighbors.

The major objectives from this Program are to:

- generate significant savings for DSM portfolio objectives;
- educate and empower customers to take advantage of other DSM programs;
- develop a positive utility image;
- promote efficient building operations; and
- lower energy bills for consumers.

Levels of Participation

The Program has been implemented with paper reports mailed to 25,000 TEP households beginning in October 2011.

Evaluation and Monitoring Activities and Results

TEP will use an independent third-party measurement, evaluation and research contractor to evaluate the energy savings from the Program.

In accordance with Decision No. 72254, a measurement and evaluation report on the results of the Program will be filed within 90 days of the evaluation of Phase 1, with proposals regarding continuation, termination, redesign or expansion. The evaluation will be filed no later than December 31, 2012.

kW, kWh, and Therm Savings

There are no kW or kWh savings for this reporting period.

Problems Encountered and Proposed Solutions

No problems were encountered during this reporting period.

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Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation *	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Home Energy Reports (Pilot)	\$ -	\$ 775	\$ -	\$ 242,396	\$ -	\$ 11,049	\$ 65	\$ 254,285

a. Includes \$221,104 paid to Opower[®], the IC.

Findings from All Research Projects

No research projects were undertaken during this reporting period.

Other Significant Information

The Program was approved in Commission Decision No. 72254 (April 7, 2011). TEP has contracted with Opower[®] to implement the pilot. Program integration with TEP information systems began late in the 2nd quarter of 2011. The initial group of 25,000 customers received three consecutive monthly reports starting October 2011.

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RESIDENTIAL AND SMALL COMMERCIAL DIRECT LOAD CONTROL PILOT PROGRAM

Description

The TEP Residential and Small Commercial Direct Load Control (“DLC”) Pilot Program is designed to determine if TEP can better manage peak demand and mitigate system emergencies through direct load control of residential and small commercial central air-conditioners (“AC”). The pilot program tests the use of two-way communication that sends load control signals to equipment at the home or business and also provides interval consumption data back to TEP for all participants. Participants will receive either: 1) a free thermostat that can be programmed manually or reset remotely via the internet; or 2) a load control device placed on their outdoor air conditioning unit. In exchange, customers will permit TEP to cycle AC units or raise thermostat temperature settings for a limited number of hours or events per year. TEP plans to operate the pilot through 2012.

Program Modifications

In order to accommodate a higher than anticipated number of homes with dual HVAC systems, 100 additional programmable communication thermostats were ordered from the implementation contractor.

Program Goals, Objectives, and Savings Targets

The primary objective of this Program is to confirm the feasibility and effectiveness of the direct load control of residential and small commercial air conditioners. Load impact results and customer feedback gained through the pilot program will enable a better assessment of cost-effectiveness of DLC and inform Program enhancements for a possible broader rollout.

Specific objectives for the pilot include the following:

- Refine estimates of load impacts through DLC;
- Test the effectiveness of the new generation of load control technology; and
- Assess the customer experience with load control events and different technologies

The goal is to recruit 600 residential and 200 small commercial customers to participate in the pilot.

Levels of Participation

Residential recruitment started in June 2011 with an email marketing request to customers for applications. Response rates are satisfactory. 510 residential customers have been recruited and equipment installed as of the end of the reporting period. Small Commercial recruitment and installation has been less than anticipated. Only 13 active commercial customers were participating at the end of the reporting period.

Evaluation and Monitoring Activities and Results

TEP will develop a detailed evaluation plan that will guide an ongoing impact, technology, and process evaluation. Elements of this plan are as follows:

- The impact evaluation will address the changes in demand during load control events. These changes in demand will be estimated using statistical regression modeling and by comparing the expected peak usage with the actual peak usage based on interval meter data.
- A technology assessment will address the accuracy, reliability, and customer acceptance of the various technologies associated with the DLC and Smart Grid architecture. These technologies include the customer-facing equipment such as in-home displays, smart

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

thermostats, and web portals as well as back-end system such as interval meter data collection via broadband.

- The process evaluation will encompass a review of how well TEP has administered the Program and how customers perceived the Program. A Program delivery assessment will include interviews with TEP staff, vendors, and participants to identify program strengths, areas for improvement, and features that are preferred or disliked by customers. Customer feedback will be a major aspect of the process evaluation and will be obtained primary through surveys of at least a portion of participants at various stages of the Program implementation.

kW, kWh, and Therm Savings

There are no savings for this reporting period.

Problems Encountered and Proposed Solutions

There were unforeseen obstacles in information technology integration that created delays in implementation and extra costs. TEP has overcome these obstacles and begun installation of Program devices in residences.

Small commercial participation has been light. This has been due to a limited number of customers available for our email marketing campaign, a high level of stipulations and requirements to participate, and a constrained value proposition for small commercial customer.

Solutions are being undertaken to increase the number of possible customers receiving mail solicitation to engage with the program, a phone calling effort to back up the email campaign, and use of customer lists of those who have participated in other commercial energy efficiency programs. A significantly beneficial rate structure design for commercial DLC would be needed to address the constrained value proposition of the program for the commercial customer. No such rate design is under consideration at this time.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation ^a	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Res. & Small Comm. Direct Load Control	\$ -	\$ 22,897	\$ -	\$ 609,474	\$ -	\$ 29,548	\$ 33,937	\$ 695,856

a. Includes \$544,587 paid to Tendril, the IC.

Findings from All Research Projects

No research projects were undertaken during this reporting period.

Other Significant Information

The Program was approved in Commission Decision No. 71846 (August 25, 2010). TEP has contracted with Tendril Networks and has purchased the equipment necessary to implement the pilot. Risk assessment and IT integration are complete, recruitment and installation of program devices for residential participants is nearing completion.

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NON-RESIDENTIAL EXISTING FACILITIES PROGRAM

Description

The TEP Non-Residential Existing Facilities Program is a multi-faceted program that will provide incentives to TEP's large commercial customers for the installation of energy-efficiency measures including lighting equipment and controls, HVAC equipment, motors and motor drives, compressed air, and refrigeration. Incentives are offered for measures in each of these categories. The Program also provides customers with the opportunity to propose innovative energy efficiency solutions through customer energy efficiency measures.

Program Modifications

No Program modifications were made during this reporting period. Additional energy measures and an increase in budget were requested as part of TEP's 2011-2012 Energy Efficiency Implementation Plan, which is pending Commission approval.

Program Goals, Objectives, and Savings Targets

The primary goal of the Program is to encourage TEP's large commercial customers to install energy efficiency measures in existing facilities. More specifically, the Program is designed to:

- Provide incentives to facility operators for the installation of high-efficiency lighting equipment and controls, HVAC equipment, premium efficiency motors and motor controls, energy efficient compressed air and leak-repair measures, and energy-efficient refrigeration system retrofits;
- Overcome market barriers including:
 - Lack of awareness and knowledge about the benefits and cost of energy efficiency improvements;
 - Performance uncertainty associated with energy efficiency projects; and
 - High first costs for energy efficiency measures.
- Assure that the participation process is clear, easy to understand and simple; and
- Increase the awareness and knowledge of facility operators, managers and decision-makers on the benefits of high-efficiency equipment and systems.

The savings goal for 2011 was 30,118 MWh.

Levels of Participation

There were 123 pre-applications and 95 final applications during this reporting period for prescriptive measures. In addition, there were 106 pre-applications and 40 final applications for custom measures. A total of \$2,056,139 in rebates was paid to 83 participants. There were 12 cancellations of final applications.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 100% for non-coincident demand savings and 97% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

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kW, kWh, and Therm Savings

Measure	No. Installed	kW savings	kWh savings	Incremental Cost
Air Compressors	0	0	0	\$0
Chillers	16	960	1,756,090	\$34,258
Condensers	0	0	0	\$0
HVAC	249	191	822,267	\$1,049
Refrigeration	393	41	917,843	\$284
Motors	246	17	9,923,538	\$3,898
Lighting	50,701	2,179	8,395,904	\$20
Custom	159	1,184	8,471,900	\$15,974
Totals	51,764	4,573	30,287,542	

Savings are adjusted for line losses of 9.5% for both demand and energy.

Problems Encountered and Proposed Solutions

There were no problems encountered during this reporting period.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation ^a	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Non-Residential Existing Facilities	\$ 2,056,139	\$ 5,278	\$ 318	\$ 615,692	\$ 1,249	\$ 120,988	\$ 98,076	\$ 2,897,741

a. Includes \$531,672 paid to KEMA, the IC.

Findings from All Research Projects

No research projects were conducted during this reporting period.

Other Significant Information

There is an ongoing evaluation of new technology, additional measures and processes that could be incorporated in the program to improve savings and cost effectiveness. The monitoring of industry changes continues.

Marketing efforts for this reporting period include:

- 165 presentations and sales calls given to:
 - various business associations and individual businesses;
 - government agencies within TEP service territory;
 - school systems within TEP service territory; and
 - Davis-Monthan and Ft. Huachuca Military Base representatives.

Two Trade Ally meetings were held in 2011. One on March 16 and the other on August 31. Year end results were presented and goals for 2011 were outlined. Training on lighting changes was also presented to the contractors.

There were seven contractor training sessions held in 2011. These sessions were based around program details, how to promote the programs, how to complete the needed paper work and how to help the customer complete the EE projects.

There were 2,838 web site hits for this Program, down about 30% from the last six months.

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The TEP Commercial DSM Programs continue to be a key part of the City of Tucson Green Certification Program. Businesses participate to stretch their investment dollars. Program presentations are given each time a certification seminar is held.

KEMA hired an Outreach Representative for their team. This person calls on customers and helps them determine which program and what measures are best suited for their participation. The Outreach Representative is also heavily involved in marketing the program through presentations and outreach events.

KEMA has updated the web site and has two new marketing pieces available. Window clings were introduced to participating businesses in 2011. A one page flyer was developed to encourage businesses to change out T12 lighting.

The rebate application has been modified in an effort to make it shorter and easier for customers to participate.

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DSM PROGRESS REPORT FOR THE PERIOD:
January through December 2011

SMALL BUSINESS PROGRAM

Description

The TEP Small Business Program is designed to minimize some of the barriers related to the implementation of energy efficiency improvements in the small business market, such as the lack of capital, information search costs, transaction costs, performance uncertainty, and the so-called "hassle factor". Small firms generally concentrate on their core businesses, and do not have the wherewithal to analyze energy use and improve efficiency.

The Program is an upstream market program providing incentives directly to contractors for the installation of selected high efficiency lighting, motors, HVAC, and refrigeration measures. The incentives are set at a higher level for this market in order to encourage contractors to market and deliver the Program, thus offsetting the need for TEP marketing and overhead expenses. In order to further reduce overhead expenses, the Program has employed internet-based measure analysis and customer proposal processing which has made the process easier for both contractors and customers.

The Program includes customer and trade ally education to help them with understanding the technologies being promoted, what incentives are offered, and how the Program functions.

Program Modifications

No Program modifications were made during this reporting period. Additional energy measures and an increase in budget were requested as part of TEP's 2011-2012 EE Plan, which is pending Commission approval.

Program Goals, Objectives, and Savings Targets

The primary objective of the Program is to encourage TEP's small business customers to install energy efficiency measures in existing facilities. More specifically, the Program is designed to:

- Encourage small business customers to install high-efficiency lighting equipment and controls, HVAC equipment, and energy-efficient refrigeration system retrofits in their facilities;
- Encourage contractors to promote the Program and provide turn-key installation services to small business customers;
- Overcome the unique market barriers of the small business market including:
 - first costs and lack of access to capital for energy efficiency improvements;
 - lack of awareness and knowledge about the benefits and cost of energy efficiency improvements;
 - hassle and transactions costs; and
 - performance uncertainty associated with energy efficiency projects.
- Assure that the participation process is clear, easy to understand and simple; and
- Increase the awareness and knowledge of business owners, building owners and managers, and other decision-makers on the benefits of high-efficiency equipment and systems.

The savings goal for 2011 was 7,479 MWh.

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Levels of Participation

278 applications were received during this reporting period. There were 8 cancellations or 3.3%. A total of \$1,031,975 in rebates was paid and 179 small businesses participated during this reporting period.

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 100% for non-coincident demand savings and 97% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

Measure	No. Installed	kW savings	kWh savings	Incremental Cost
HVAC	101	1	445,891	\$238
Refrigeration	369	19	216,970	\$289
Lighting	26,143	1,641	7,325,076	\$74
Totals	26,613	1,661	7,987,937	

Savings are adjusted for line losses of 9.5% for both demand and energy.

Problems Encountered and Proposed Solutions

There was a decrease in program participation in 2011. Some key trade allies shifted their business focus outside TEP's service territory. In addition several potential participants expressed interest in non-prescriptive energy efficiency measures, which resulted in them participating in the custom measure category of the Non-residential Existing Facilities Program. TEP will work to increase Program participation in 2012 by re-engaging existing trade allies, recruiting new trade allies, and emphasizing the advantages of the prescriptive measures.

Costs Incurred

Costs incurred during the reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation *	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Small Business	\$ 1,031,975	\$ 3,564	\$ -	\$ 571,434	\$ 3,398	\$ 73,523	\$ 74,428	\$ 1,758,322

a. Includes \$528,993 paid to KEMA, the Implementation Contractor.

Findings from All Research Projects

No research projects were conducted during this reporting period.

Other Significant Information

Two trade ally meetings were held in 2011. 2010 year end results were presented and goals for 2011 were outlined. In addition there were seven contractor training sessions held in 2011. These sessions were based around program details, how to promote the programs, how to complete the needed paperwork and how to help the customer complete EE projects.

Marketing efforts for this reporting period include:

- 178 presentations and sales calls made to:
 - various Business associations and individual businesses;
 - government agencies within TEP service territory;

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

- school systems within TEP service territory; and
- Davis-Monthan and Ft. Huachuca Military Base representatives.

The TEP Small Business Program website was updated. There were 2,683 hits on the web site, which has proven to be a successful marketing tool for the Program.

KEMA hired an Outreach Representative to their team. This person helps customers determine which measures are best suited for their participation. This person is also heavily involved in marketing the program through presentations and outreach events. KEMA has established a sales call tracking data base that will help get more repeat business and help track detailed customer participation.

Window clings were introduced to participating businesses in 2011. A one page flyer was developed to encourage businesses to change out T12 lighting.

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DSM PROGRESS REPORT FOR THE PERIOD:
January through December 2011

EFFICIENT COMMERCIAL BUILDING DESIGN PROGRAM

Description

The Efficient Commercial Building Design Program is geared toward the building owner/developer and is designed to encourage improved building energy efficiency in new commercial construction compared to standard building practices.

The Program is a performance-based program that includes design assistance for the design team, performance-based incentives for the building owner and developer, and energy design information resources. Design assistance involves efforts to integrate energy efficiency into a customer's design process as early as possible. The Program provides incentives to offset the additional design cost of alternative, energy-efficient designs.

In addition to the design incentives and performance-based incentives for the building owner/developer, this Program provides technical support services to the design community. The Program provides consumer education and promotional pieces designed to assist building owners/developers in understanding various energy efficiency options and encourage them to explore energy efficiency options.

Program Modifications

No Program modifications were made during this reporting period.

Program Goals, Objectives, and Savings Targets

The primary goal of the Program is to encourage energy-efficient new building design for new, non-residential projects in TEP's service area. More specifically, the Program is designed to:

- Provide incentives to building owners/developers to design and build more energy-efficient buildings;
- Provide assistance to design teams to offset the additional cost and time of investigating more energy-efficient design;
- Overcome certain market barriers;
- Assure that the participation process is clear and easy to understand and does not unduly burden the design and construction time schedule or budget process;
- Increase the awareness and knowledge of building owners/developers, architects, engineers, and decision-makers on the benefits of high efficiency buildings design; and
- Encourage building owners/developers and the design community to consider energy efficiency options as early in the design process as possible.

The savings goal for 2011 was 1,832 MWh.

Levels of Participation

There were 15 participants in calendar year 2011, with 18 buildings completed. Four of the 15 participants received design assistance, three of which completed construction. Of the 18 buildings completed, five also received design assistance.

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

Evaluation and Monitoring Activities and Results

Navigant Consulting performed an evaluation of this Program for 2011. The evaluation resulted in a realization rate of 102% for non-coincident demand savings and 105% for energy savings. This report is attached in Appendix 1. 2011 savings have been updated as a result of the 2011 evaluation.

kW, kWh, and Therm Savings

Measure	No. of Participants	No. of Buildings	kW savings	kWh savings	Therm savings
Design Assistance	4	4	0	0	0
Completed Buildings	14	18	1,511	5,122,446	0
Total	15^a	22	1,511	5,122,446	0

Savings are adjusted for line losses of 9.5% for both demand and energy.

a. Three of the participants completing buildings also received design assistance.

Problems Encountered and Proposed Solutions

No problems were encountered during this reporting period.

Costs Incurred

Costs incurred during the reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation ^a	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
Efficient Commercial Business Design	\$ 427,969	\$ 838	\$ -	\$ 135,036	\$ 1,203	\$ 24,964	\$ 8,653	\$ 598,661

a. Includes \$118,481 paid to KEMA, the IC.

Findings from All Research Projects

No research projects were conducted during this reporting period.

KEMA Expenses

Commission Decision Nos. 71820 (August 10, 2010) and 71836 (August 10, 2010) require TEP to report how much is paid to the IC (KEMA), by program and in total. KEMA Expenses are listed below:

KEMA Expenses for 2011 (Jan-Dec)		
Program	Expenses	% of Total Program Expenses
Non-Residential Existing Facilities	\$ 531,672	18%
Small Business	\$ 528,993	30%
Efficient Commercial Building Design	\$ 118,481	20%
Total	\$ 1,179,146	22%

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

COMMERCIAL AND INDUSTRIAL DIRECT LOAD CONTROL PROGRAM

Description

The TEP Commercial and Industrial (“C&I”) Direct Load Control (“DLC”) Program is designed to manage peak demand and mitigate system emergencies through a commercial and industrial load curtailment program. The Program is delivered on a turn-key basis by a third-party implementation contractor, who negotiates load reduction agreements with multiple customers and “aggregates” those customers to provide TEP a confirmed and guaranteed load reduction capacity available upon request. The goal of the Program will be to enroll enough customers to provide up to 40 MW of summer peak demand reduction, available for up to 80 hours per year, with a typical load control event lasting 3-4 hours.

Program Modifications

There have been no Program modifications this reporting period.

Program Goals, Objectives, and Savings Targets

The primary goal of the Program is to provide up to 40 MW of summer peak demand reduction, available for up to 80 hours per year, in order to mitigate system emergencies.

Levels of Participation

34 participants were enrolled as of December 31, 2011, with a total commitment of 11,605 kW of load reduction under contract.

Twelve load control events were initiated during this reporting period. The kW reduction per event as reported by the IC is:

Date of Event	Duration of Event	kW Reduction
1/3/11	1 hour	7.72
2/2/11	1 hour	7.91
2/3/11	2 hours	8.13
2/3/11	1 hour	4.36
6/27/11	1.25 hours	11.63
7/19/11	1 hour	12.98
7/28/11	3 hours	11.95
8/2/11	3 hours	11.85
8/17/11	2 hours	6.45
8/23/11	3 hours	12.88
9/7/11	1 hours	12.88
9/8/11	2 hours	2.27

Evaluation and Monitoring Activities and Results

Monitoring and evaluation of the Program will help ensure that the load curtailments are providing the megawatts for which TEP is paying and counting on for resource planning purposes. TEP will develop a detailed evaluation plan that will guide an ongoing impact and process evaluation. Elements of this plan are as follows:

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

- The impact evaluation will address the changes in demand during load control events. These changes in demand will be estimated using statistical regression modeling and by comparing each customer's expected usage during an event with their actual usage based on interval meter data during the event and in the days and hours prior to the event. The customer-specific load reductions reported by the DR provider will be verified, and system-wide reduction estimated using data from the entire summer season. Alternative baseline methodologies may be examined to assess whether alternative baselines provide a more accurate prediction of usage.
- The process evaluation will encompass a review of how well TEP and the selected third party implementation contractor has administered the Program and how customers perceive the Program. A Program delivery assessment will include interviews with TEP staff, vendors, and participants to identify Program strengths, areas for improvement, and features that are preferred or disliked by customers. Customer feedback will be a major aspect of the process evaluation and will be obtained primary through surveys of at least a portion of participants at various stages of the Program implementation.

A full third-party evaluation and verification is not available as of this reporting date. TEP will provide an evaluation of this program for the years 2011 and 2012 in the 2012 year end DSM progress report.

kW, kWh, and Therm Savings

The Energy Efficiency Standard allows a credit for demand response and load management programs per A.A.C. R14-2-2404 (C). Peak reduction capability may be converted to an annual energy savings equivalent based on an assumed 50% load factor. The credit shall not exceed 10% of the annual standard. The following table shows the allowable credit for this Program based on the available capacity reduction and the 10% cap.

No. of Participants	Available MW reduction	MWh savings credit
34	11.60	11,615

Problems Encountered and Proposed Solutions

Program growth has been slower than expected. Sales efforts are being increased by the implementation contractor.

Costs Incurred

Costs incurred during this reporting period are listed below:

DSM Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation ^a	Program Marketing	Planning & Admin	Measurement, Evaluation & Research	Program Total Cost
C&I Direct Load Control	\$ -	\$ 4,433	\$ -	\$ 693,875	\$ -	\$ 47,171	\$ 2,421	\$ 747,900

a. Program implementation expenses include participant incentives, however, that information is confidential.

There is no customer interfacing hardware installed as part of this Program. However, 80 current transformers were installed for metering purposes at a total cost of \$35,851. Of this total, \$22,276 was for equipment and \$13,575 was for labor.

Findings from All Research Projects

No research projects were undertaken during this reporting period.

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DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

MISCELLANEOUS DSM INFORMATION

Description

TEP filed its 2011-2012 Energy Efficiency Implementation Plan ("Plan") on February 1, 2011, in accordance with Section R14-2-2405 of the Electric Energy Efficiency Standards ("EES" or "Standard"). The Plan asks for continuance of existing DSM programs and the approval of new DSM programs, to be implemented either in 2011 or 2012. TEP is proposing the following new Residential, Commercial, Behavioral and Support DSM Programs: Multi-Family, Appliance Recycling, Schools Program, Combined Heat and Power Pilot, Retro-Commissioning, Bid-for-Efficiency, Behavioral Comprehensive (including K-12 Education, Direct Canvassing, Compact Fluorescent Bulb give-away, and Community Education), Residential Financing, and Codes and Support. The Residential Efficient Home Cooling Program was the only program terminated in 2011; no other programs or measures were terminated. Please see the Existing Homes Retrofit and Residential Energy Assessment Program section for further information. No programs or measures are expected to be terminated in 2012.

TEP has also researched new technologies for possible inclusion in future Plans. Two promising technologies include the Colorado™, which is an advanced design evaporative cooling system, and the Ice Bear®, which is a small scale thermal storage system that makes ice during the nighttime hours which is then used to provide cooling during peak hours in the daytime. Both products have advantages, but TEP has determined that they are not cost-effective to implement at this time. TEP will continue to research these and other emerging technologies to help meet the future EE Standard.

In order to properly track and report the extensive energy savings and expenses associated with the EE Standards TEP has identified the need for a comprehensive tracking and reporting software solution. In March TEP submitted an RFI to 12 prospective vendors, and received ten responses. After evaluation TEP submitted a Request for Quote to the top two vendors in June. In November TEP selected Nexant's TrakSmart® software as a database for tracking and reporting.

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January through December 2011

APPENDIX I – MEASUREMENT, EVALUATION, AND RESEARCH REPORTS

- Arizona Energy Office Training, Monitoring, and Evaluation Report – July 2011
- Navigant Consulting - TEP Demand Side Management 2011 Portfolio Savings Verification Report

**ARIZONA GOVERNOR'S OFFICE of ENERGY POLICY
TRAINING, MONITORING AND EVALUATION REPORT
FISCAL YEAR 2012 ANNUAL REPORT
January 2012
Tucson Electric Power**

Re: Arizona Governor's Office of Energy Policy Contract M030-08

Training and Monitoring for Weatherization

Southwest Building Science Training Center

The Southwest Building Science Training Center (Training Center), operated by the Foundation for Senior Living Home Improvement (FSL) and funded through the OEP and local utilities, provides Arizona low-income weatherization technicians with the knowledge and skills needed to successfully perform diagnostics and repairs on Arizona's housing stock. The Energy Office has entered into agreement with FSL to fund a full time position to develop, coordinate and implement a comprehensive training program at the training center and an administrative assistant position.

The Training Center has started the expansion of the training center by developing a multistory training lab that will be used to provide real world hands on training to the new green workforce. Funding has been committed utilizing American Recovery and Reinvestment Act of 2009 (ARRA) funds for the construction of an expanded diagnostic lab. The lab has received additional funding and donations for utility companies, manufacturing companies and local contractors.

Training center courses

<http://www.fsl.org/services/HomeEnergy/hecourses.html>

The Center, in partnership with the Building Performance Institute, Inc. (BPI), provides nationally recognized building science certifications to Arizona's weatherization agencies. All agencies have BPI Certified staff members or contractors that are BPI certified.

In 2011-12 the Training Center has provided almost 8,000 hours of training hours (attendees times class hours) to over 350 course attendees. Since 2009 over 400 contractors have been certified through BPI.

Details on BPI

<http://www.bpi.org/>

The Training Center has implemented a Lead Renovator Repair and Painting certification class. On April 22nd 2010 the new EPA Regulations went into effect regarding lead safe work practices. All contractors working on houses Pre-1978 are now required to be registered with the EPA as a lead renovator firm. Any contractors performing work on houses must now have at least one person on their crew that is "Lead Renovator" certified. This certification requires an 8 hour training which involves both a Power Point slide presentation and a "Hands On" section to teach lead safe practices when working on a home with a potential for Lead based paint. Certification requires the participant to pass both a written and field skills test.

The Training Center has implemented an OSHA 30 hour and 10 hour certification course.

The OSHA 30 Hour Construction Industry Outreach Training course is a comprehensive safety program designed for anyone involved in the construction industry. Specifically devised for safety directors, foremen, and field supervisors; the program provides complete information on OSHA compliance issues. OSHA recommends Outreach Training Programs as an orientation to occupational safety and health for workers covered by OSHA 29 CFR 1926

The OSHA 10 Hour Construction Industry Outreach Training Program is intended to provide an entry level construction worker's general awareness on recognizing and preventing hazards on a construction site. OSHA recommends Outreach Training Program courses as an orientation to occupational safety and health for workers covered by OSHA 29 CFR 1926.

The Training Center was also awarded a grant from the Department of Energy to expand the curriculum and tailor it towards the Auditor, Inspector and Crew Members of the technicians in the field. This is a two year grant that will help deliver the skilled workers that will be needed to conduct energy retrofits on existing housing.

Peer-to-Peer Fiscal and Technical Procedures

The Arizona WAP has formed peer-to-peer working groups that allow the fiscal and technical staff from the agencies and the OEP to meet and discuss issues that arise in the program. Agencies are able to share solutions to common problems and other information. These peer-to-peer meetings occur every two months and have been a great arena to discuss any changes or improvement to the program.

Agency Personnel Performance Reviews

A review and monitoring process to evaluate the competency of agency personnel performing the various requirements of the weatherization program was developed for the statewide weatherization assistance program. Based on this process, additional one-on-one training and technical assistance is provided on an as-needed basis.

Inspections

The Arizona WAP has implemented a monitoring program that focuses on determining areas that need improvement and utilizes the monitoring process to implement needed changes. The areas covered include: auditing, diagnostics, testing and measures completed and program operations. This process begins with the review of 100% of the technical reports for auditing, diagnostics, testing and work completed each month. These reports can highlight instances where opportunities were missed or program requirements were not followed. When there are concerns with some element of the report, a site visit is conducted to address the concerns. At the job site, the diagnostic, testing and work are reviewed to determine if any improvements can be made. A minimum of 15% of the job sites will be visited with visits taking place approximately twice a month. Based on the site visit results, follow-up training and technical assistance is provided to the local agency. For agencies where the technical reports do not show concerns, the site visit consists of monitoring a number of randomly selected homes and reviewing the diagnostics, testing and work completed. These efforts, combined with the training and competence programs, have a goal of ensuring that the program is providing the clients

with a high return on Southwest's investment, while maintaining or improving the customers' health and safety.

Utility Bill Analysis

To date, an analysis of 275 homes has been completed on homes utilizing APS, TEP, Unisource Gas and Electric and Southwest Gas utility data. This analysis is ongoing, new data will be updated to these values on a quarterly basis.

Provided are Savings to Investment Ratios (SIR) for total investment from all funding spent (diagnostics, energy measures and health and safety measures) and for energy related measure only (diagnostics and energy measures).

Assumptions

Present value is based on 17.5 years measure life, discount rate of 3% and an utility cost escalation rate of 1%.

Results Summary

The combined SIR of all jobs reviewed to date for funds spent on diagnostics, energy measures and health and safety measures was 1.21. Health and saving represented 16% of expenditures.

The combined SIR of all jobs reviewed to date for funds spent on energy measures and diagnostics was 1.38

The average saving per home reviewed was 2746 kWh and 35 therms of natural gas (gas therms average includes all electric homes).



TEP Demand Side Management 2011 Savings Verification Report

January 1, 2011-December 31, 2011

**Presented to:
Tucson Electric Power
Randy Altergott and Denise Smith**

February 24, 2012

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Section 1. Summary

This report presents realization rates, proposed changes, and adjustments to the 2011 energy and demand savings calculations for the Tucson Electric Power (TEP) residential and commercial energy efficiency programs after completing a savings verification review of reported savings. Benefit-Cost calculations were outside the scope of this task and were not reviewed.

For details on algorithms or assumptions, see the Navigant-reviewed workbooks:

Commercial Programs -

2011_TEP_Commercial New Construction_2012_02_24_FINAL
2011_TEP_Large Business_2012_02_24_FINAL
2011_TEP_SmallBusiness_2012_02_24_FINAL

Residential Programs -

2011_TEP_Efficient Home Cooling_2012_02_24_FINAL
2011_TEP_Res New Construction_2012_02_24_FINAL
2011_TEP_LIW_Shade_CFL_Kit_2012_02_24_FINAL
2011_TEP_Existing Homes_2012_02_24_FINAL

TEP has reported values at meter. Navigant presents values both at meter and at generator. A line-loss factor (LLF) of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. The following algorithm is used to calculate at generator values:

$$\text{At generator} = \text{At meter value} * (1 + \text{Line Loss Factor (LLF)})$$

Ex-Ante utility reported Capacity Savings (kW) were detailed as non-coincident demand savings for some programs but not for others. As a result, Navigant has calculated realization rates based on non-coincident demand savings. Programs that report coincident demand savings will not have applicable realization rates. Navigant recommends that all ICs report one type of capacity savings in the future.

Table 1-1, Table 1-2, and Table 1-3 present summary findings and adjustments for energy savings.

Overall, TEP had at meter verified non-coincident demand savings of 95.64 MW. Verified coincident savings were determined to be 21.42 MW. Verified at meter annual energy savings were determined to be 117,055 MWh.

Total at generator verified non-coincident demand savings were determined to be 104.72 MW. Verified coincident demand savings at generator were determined to be 23.46 MW. Verified at generator annual energy savings were determined to be 128,175 MWh.

Total reported gas savings for Low Income Weatherization, Residential New Construction, and Behavioral programs were 53,792 therms. The verified gas savings were determined to be 62,652 therms.

Realization rates for demand and annual energy savings were calculated to be 100% and 99% respectively. The realization rate for annual therm savings was calculated to be 116%.

Table 1-1. TEP 2011 Portfolio Demand & Energy Savings Summary at Generator

Program	Non-Coincident Demand Savings (MW)			Coincident Demand Savings (MW)			Annual Energy Savings (MWh)		
	Reported Demand	NCI Verified Demand	Realization Rate	Percent of Portfolio	Reported	NCI Verified	Realization Rate	Percent of Portfolio	
Residential Programs									
Low-Income Weatherization	N/A	N/A	N/A	N/A	472	472	100%	0.4%	
Residential New Construction	1.3	1.7	130%	1.6%	1,105	1,068	97%	0.8%	
Shade Tree	N/A	N/A	N/A	N/A	744	714	96%	0.6%	
Efficient Products Program	92.3	92.3	100%	88.1%	79,977	79,930	100%	62.4%	
Efficient Home Cooling	0.5	0.5	100%	0.5%	1,097	1,097	100%	0.9%	
TEP Existing Homes & Audit Direct-Install	0.9	0.8	89%	0.8%	813	786	97%	0.6%	
Behavior - Kits*	N/A	0.3	N/A	0.2%	335	410	123%	0.3%	
Commercial Programs									
Small Business	2.2	2.2	100%	2.1%	8,231	7,986	97%	6.2%	
Non-Residential Existing Facilities	5.5	5.4	97%	5.1%	30,955	30,354	98%	23.7%	
Commercial New Construction	1.5	1.5	102%	1.5%	5,122	5,358	105%	4.2%	
Utility Totals	104.30	104.72	100%	100%	128,851	128,175	99%	100%	

At generator values are calculated by the following algorithm: at meter*(1+LLF).

* Behavior Program only reported coincident demand savings.

Table 1-2. TEP 2011 Portfolio Demand & Energy Savings Summary at Meter

Program	Non-Coincident Demand Savings (MW)			Verified Coincident Demand Savings (MW)			Annual Energy Savings (MWh)			
	Reported Demand	NCI Verified Demand	Realization Rate	Reported Demand	NCI Verified Demand	Realization Rate	Reported	NCI Verified	Realization Rate	Percent of Portfolio
Residential Programs										
Low-Income Weatherization	N/A	N/A	N/A	N/A	N/A	100%	431	431	100%	0.4%
Residential New Construction	1.2	1.5	130%	N/A	N/A	N/A	1,009	975	97%	0.8%
Shade Tree	N/A	N/A	N/A	N/A	N/A	N/A	680	652	96%	0.6%
Efficient Products Program	84.3	84.3	100%	13.9	13.9	100%	73,038	72,996	100%	62.4%
Efficient Home Cooling	0.5	0.5	100%	N/A	N/A	N/A	1,002	1,002	100%	0.9%
TEP Existing Homes & Audit Direct-Install	0.8	0.7	89%	0.5	0.5	100%	742	718	97%	0.6%
Behavior - Kits*	N/A	0.2	N/A	0.03	0.03	100%	306	375	123%	0.3%
Commercial Programs										
Small Business	2.0	2.0	100%	1.5	1.5	100%	7,517	7,293	97%	6.2%
Non-Residential Existing Facilities	5.0	4.9	97%	4.3	4.3	100%	28,269	27,721	98%	23.7%
Commercial New Construction	1.4	1.4	102%	1.2	1.2	100%	4,678	4,893	105%	4.2%
Utility Totals	95.25	95.64	100%	21.42	21.42	100%	117,672	117,055	99%	100%

* Behavior Program only reported coincident demand savings.

Table 1-3. TEP 2011 Therm Savings Summary

Program	Annual Therm Savings			Percent of Portfolio
	Reported	NCI Verified	Realization Rate	
Residential Programs				
Low-Income Weatherization	5,495	5,495	100%	8.8%
Residential New Construction	14,732	15,627	106%	24.9%
Shade Tree	N/A	N/A	N/A	N/A
Efficient Products Program	N/A	N/A	N/A	N/A
Efficient Home Cooling	N/A	N/A	N/A	N/A
Existing Homes & Audit Direct-Install	N/A	N/A	N/A	N/A
Behavior - Kits	33,565	41,530	124%	66.3%
Commercial Programs				
Small Business	N/A	N/A	N/A	N/A
Large Business	N/A	N/A	N/A	N/A
Commercial New Construction	N/A	N/A	N/A	N/A
Utility Totals	53,792	62,652	116%	100%

The following sections present a summary of major findings of proposed changes and/or confirmation that no changes are required to reported savings.

2.1 Low Income Weatherization

Savings per home are derived per AEO directive; savings per home increased slightly from 2010 (2667 kWh and 32 therms) to 2011 (2746 kWh and 35 therms). The Low Income Weatherization program has a realization rate of 100%. There are no demand savings reported for this program.

2.2 Residential New Construction

The Residential New Construction Program had an energy realization rate of 97% and a non-coincident demand realization rate of 130%.

The slightly low energy realization rate is due to a slight overestimation of the IC's claimed energy savings on a few homes. The high demand realization rate is due to an underestimation of the IC's claimed demand savings on several homes. Navigant's verification efforts focused on a review of the IC's provided end-use savings summaries and the as-built REM/Rate building files.

In an effort to move the program towards the national ENERGY STAR® program, a majority of program home participants (337) reported performance-based savings based on RESNET testing procedures. However, a number of homes (267) as part of the legacy Guarantee Home Program (GHP) reported pre-determined deemed savings based on HERS index score tier and HVAC type per an existing agreement with participating local home builders.

For the homes with reported performance-based savings, Navigant conducted a desk review of a sample of as-built REM/Rate building files for actual home premises. Navigant found the building files to be in good order with no erroneous building input fields that would affect savings calculations.

Based upon findings from its desk review, Navigant applied average home savings from the tested/rated homes and compared them to the GHP deemed savings values. Table 2-1 shows a comparison of the deemed and tested savings by home type (HERS index score tier and HVAC type).

Table 2-1. GHP Deemed and Performance-based/ Tested Savings Summary

Home Type	HERS Index	KW		kWh		Therms	
		GHP Deemed Coincident Demand KW Savings	Performance-based/ Tested Coincident Demand KW Savings	GHP Deemed kWh Savings	Performance-based/ Tested kWh Savings	GHP Deemed Therm Savings	Performance-based/ Tested Therm Savings
All Electric - Tier 1a	71-85	0.93	3.10	1,583	1,453	-	-
All Electric - Tier 2a	46-70	1.85	5.47	3,164	3,066	-	-
All Electric - Tier 3a	<45	3.18	5.94	9,457	2,246 ¹	-	-
Dual Fuel - Tier 1b	71-85	1.21	1.35	1,369	1,363	37	46
Dual Fuel - Tier 2b	46-70	2.92	1.59	1,683	1,705	89	73

2.3 Shade Trees

The overall annual realization rate for energy savings is 96%; there are no demand savings reported for this program.

Savings per tree are derived per ACC directive and need not be changed. However, TEP conducted inspections in 2011 on over 530 trees. Twenty-two trees were mis-planted (planted North of the home, or 20-50 feet away from home) and three trees were found dead. As such, Navigant used a 4% misplacement rate reduction to account for these trees. This rate is in line with other utility shade tree programs. Navigant will support this rate with modeling in the future.

2.4 Efficient Products

The Efficient Products program, which in 2011 only consisted of CFLs, had an overall annual energy and non-coincident demand realization rate of 100%.

Navigant verified annual savings of the CFLs bought based on the extended database provided by Ecova and deemed savings for each bulb model type from the program's 2011 Measure

¹ Performance-based/ tested kWh savings for the All Electric – Tier 3a savings are much lower than the GHP Deemed savings due to exclusion of solar technologies, which were not accounted for in the performance modeling.

Analysis Sheet (MAS). Slight differences between the reported and verified savings occurred in assumptions for 3-way bulb (base and efficient) wattages.

2.5 Efficient Home Cooling

The energy and non-coincident demand savings realization rates for this program are both 100%.

The IC's reported deemed savings values for this program were consistent with 2010 and 2009 MER results. Navigant found no issues or discrepancies in the program tracking datasets used to determine program savings. This program stopped providing incentives in summer 2011 and was replaced by the newly approved Existing Homes and Audit Direct Install Program.

2.6 Existing Homes and Audit Direct Install

The Existing Homes and Audit Direct-Install Program had an energy savings realization rate of 97% and a non-coincident demand savings realization rate of 89%. The primary reason for a slightly low energy savings realization rate is due to a misclassification of the HVAC Early Replacement measure subcategories (i.e., Packaged versus Split, A/C versus Heat Pump, and the addition of Duct Test & Repair), which overestimated energy savings on a few homes; this misclassification had a greater corollary effect on the non-coincident demand savings realization rate as misclassification of Downsizing can cause a slight overestimation on non-coincident demand savings.

Navigant's verification efforts focused on a review of the IC's provided program tracking dataset. Subsequent data requests were made to the IC along with a review of invoice summaries for site homes that received audits, a cross-check of site home addresses within TEP's Customer Care and Billing system, and correspondence with TEP's staff.

2.1 Behavioral Suite

The Behavioral Suite of programs consisted of K-12 Education Kits and Community Education Kits. The reported demand savings were coincident demand savings; as such no realization rate was calculated. The overall annual energy realization rate for this program was calculated to be 123%.

Navigant adjusted the savings values from what was provided in the original 2011 MAS for the K-12 Education Kits based on program updates that occurred during the year (additional items were included in the kit during the year). This led to higher realization rates for both electric and gas savings. Savings values in the Community and Modified Community (modified towards the end of the year as supplies ran out) Kits remained the same as reported by TEP.

2.2 Residential Summary

Overall, Navigant's savings verification of TEP's residential programs resulted in realization rates of 100% for non-coincident demand savings, 100% for annual electric energy savings, and 116% for annual gas savings.

Table 2-2 below presents reported savings (as provided by TEP to Navigant for review) and verified savings (adjusted savings post Navigant review), as well as the Realization Rate (Verified Savings/Reported Savings).

Table 2-2. Residential Programs Summary

	Non Coincident Demand Savings (MW)	Annual Energy Savings (MWh)	Annual Therm Savings
Reported at Meter	86.19	76,466	53,792
Verified at Meter	86.55	76,431	62,652
Realization Rate	100%	100%	116%

Section 3. Small Business Program

3.1 Air Conditioning and Heat Pumps

Air Conditioning and Heat Pump measures had an overall energy realization rate of 115% and a non-coincident demand realization rate of 100%.

Energy savings were higher due to the fact that a set of programmable thermostats that were installed in schools used the wrong deemed savings values from the most updated 2011 MAS. Programmable thermostats do not have demand savings, and as such, did not affect the non-coincident demand savings realization rate.

3.2 Refrigeration

Refrigeration measures had an overall annual energy and non-coincident demand realization rates of 100%. All claimed savings values matched the most updated 2011 MAS deemed savings value.

3.3 Lighting

Navigant's review of the Commercial Lighting program reported savings identified an overall annual energy realization rate of 96% and annual overall non-coincident demand realization rate of 100%.

The following adjustments were made to the lighting savings estimates, which increased and decreased energy and demand realization rates on a per measure basis:

- Fixture wattages were reviewed and updated based on the most updated 2011 MAS. For lamp types not in the current MAS, Navigant used industry standard fixture wattage assumptions to verify reported fixture wattages
- Navigant included HVAC Interaction Factors in the calculation of demand and energy savings
- Due to the lack of detail regarding occupancy sensor installations, Navigant assumed that the occupancy sensors were installed to a connected load equal only to that of the sum of the wattages of all new fixtures
- Navigant also assumed demand and energy savings factors based on building type from the most updated 2011 occupancy sensor MAS
- Furthermore, Navigant assumed that occupancy sensors' savings are based on the reported operating hours of fixtures replaced

Navigant recommends the implementation of the following items for better documentation and review in future years of the Small Business program:

- Create standardized nomenclature for lighting fixtures so that there is no uncertainty regarding the wattage of each fixture replaced and installed

- Document whether projects are interior or exterior lighting measures. This is essential for calculating coincident demand savings (especially whether the lighting fixture is an interior or exterior measure) as well utilizing the correct HVAC Interaction Factors for demand and energy savings.

3.4 Small Business Summary

Overall, Navigant's savings verification of TEP's Small Business Program resulted in realization rates of 100% for non-coincident demand savings and 97% for annual electric energy savings.

Table 3-1 below presents Reported (as provided by TEP to Navigant for review) and Verified Savings (adjusted savings post Navigant review), as well as the Realization Rate (Verified Savings / Reported Savings).

Table 3-1. Small Business Program Summary

	Non Coincident Demand Savings (MW)	Annual Energy Savings (MWh)	Annual Therm Savings
Reported at Meter	2.0	7,517	-
Verified at Meter	2.0	7,293	-
Realization Rate	100%	97%	-

Section 4. Commercial New Construction

Overall, Navigant's savings verification of TEP's Commercial New Construction Program resulted in realization rates of 102% for demand savings and 105% for annual electric energy savings.

The greater than expected energy and demand savings can largely be attributed to certain projects that had a reduction in lighting power density (LPD) which did not include the interactive effects of HVAC equipment.

Table 4-1 presents Navigant's savings verification of the Commercial New Construction program resulted in increase in energy savings. The table below presents Reported (as provided by TEP to Navigant for review) and Verified Savings (adjusted savings post Navigant review), as well as the Realization Rate (Reported Savings / Verified Savings).

Table 4-1. Commercial New Construction Summary

	Non-Coincident Demand Savings (MW)	Annual Energy Savings (MWh)	Annual Therm Savings
Reported at Meter	1.38	4,678	-
Verified at Meter	1.41	4,893	-
Realization Rate	102%	105%	-

Section 5. Non-Residential Existing Facilities

5.1 HVAC

Review of IC-provided demand savings estimates resulted in a demand realization rate of 95% and an energy realization rate of 98%. The reduction in verified savings when compared to the reported savings is largely due to the implementation contractor using a weighted average value from the measure analysis sheet (MAS). Navigant calculated measures savings using the data provided in the tracking database to calculate savings on a measure-by-measure basis.

Demand savings are non-coincident demand savings multiplied by a coincidence factor of 0.95. A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

5.2 Refrigeration

TEP provides rebates for the installation of a variety of refrigeration measures such as night covers, high efficiency ice makers and refrigerators, and evaporator fan motors. Review of IC-provided demand savings estimates resulted in lower demand and energy savings with realization rates of 99% and 100% respectively.

Demand savings are non-coincident demand savings multiplied by a coincidence factor of 0.98. A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

No specific reason for the low demand savings results were found.

5.3 Motors

Review of IC-provided demand savings for motor measures installed through the Large Business program resulted in the reported demand and energy savings being equal to the verified demand and energy savings with realization rates of 100%.

Demand savings are non-coincident demand savings multiplied by a coincidence factor of 0.95. A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

5.4 Lighting

Review of IC-provided savings estimates for lighting measures installed through the Large Business program resulted in lower demand and energy savings with realization rates of 98% and 96% respectively.

Demand savings are non-coincident demand savings multiplied by a coincidence factor of 0.93². A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

The reduction in verified savings when compared to the reported savings is largely due to the implementation contractor using a weighted average value from the measure analysis sheet (MAS). Navigant calculated measures savings using the data provided in the tracking database to calculate savings on a measure-by-measure basis.

5.5 Custom

TEP provides rebates for the installation of measures that are not detailed in its prescriptive measure offerings, referred to as Custom Measures. Navigant determined the realization rates of custom measures for energy and demand savings to be 98% and 99% respectively.

A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

The reduction in verified savings when compared to the reported savings is largely due to the implementation contractor using a weighted average value from the measure analysis sheet (MAS). When possible, Navigant calculated measures savings using the data provided in the tracking database to calculate savings on a measure-by-measure basis. When custom calculations were not possible, Navigant conducted a detailed review of the project level documentation provided by the IC.

5.6 Variable Speed Drives (VSD)

Review of IC-provided savings estimates for VSD measures installed through the Large Business program resulted in verified energy savings equal to the reported energy savings, yielding a realization rate of 100%.

Demand savings are non-coincident demand savings multiplied by a coincidence factor of 0.95. A line-loss factor of 9.5% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

5.7 Non-Residential Existing Facilities Summary

All together, the above changes resulted in realization rates of 97% for demand savings, 98% for annual energy savings.

² A coincidence factor of 1.00 was used for Exit Sign measures. A coincidence factor of 0.02 was used for HID Exterior measures.

Table 5-1 below presents Reported and Verified Savings at Generator (adjusted savings post Navigant review accounted for Line Loss, and for demand savings, coincidence factor) and Meter, as well as the Realization Rates (Verified Savings/Reported Savings).

Table 5-1: Non-Residential Existing Facilities Program Summary

	Non-Coincident Demand Savings (MW)	Annual Energy Savings (MWh)	Annual Therm Savings
Reported at Meter	5.04	28,269	-
Verified at Meter	4.90	27,721	-
Realization Rate	97%	98%	-

5.8 Commercial Summary

Overall, Navigant's savings verification of TEP's commercial programs resulted in realization rates of 99% for non-coincident demand savings and 99% for annual electric energy savings.

Table 5-2 below presents reported savings and verified savings (adjusted savings post Navigant review), as well as the Realization Rate (Verified Savings/Reported Savings).

Table 5-2: Commercial Programs Summary

	Non Coincident Demand Savings (MW)	Annual Energy Savings (MWh)	Annual Therm Savings
Reported at Meter	8.5	40,464	N/A
Verified at Meter	8.4	39,906.59	N/A
Realization Rate	99%	99%	N/A

Tucson Electric Power Company

DSM PROGRESS REPORT FOR THE PERIOD:
January through December 2011

APPENDIX 2 – COMMISSION APPROVED DSM PROGRAMS AND MEASURES FOR 2011	
DSM Program	Approved Measures
Residential Programs	
Low-Income Weatherization	Whole House Low Income Weatherization
Residential New Construction	Tier 1
	Tier 2
	Tier 3
Shade Tree Program	Shade Tree
ENERGY STAR® Lighting (CFL)	Integral CFL
Efficient Home Cooling	SEER 14 or greater AC or Heat Pump Retrofits
Existing Home Program	Air Sealing
	Air Sealing & Attic Insulation
	Duct Sealing (Performance)
	Duct Sealing (Prescriptive)
	Early Retirement HVAC with QI and Duct Sealing (Performance)
	Early Retirement HVAC with QI and Duct Sealing (Prescriptive)
	ROB HVAC with QI and Duct Sealing (Performance)
	ROB HVAC with QI and Duct Sealing (Prescriptive)
	Shade Screens
	Screw in CFL - Direct Install from Audit
	Advanced Power Strips - Direct Install from Audit
	Behavioral changes resulting from Energy Assessments
	Residential & Small Comm. Direct Load Control
Commercial Programs	
Non-Residential Existing Facilities	Custom Measures
	14 SEER Packaged and Split AC's
	14 SEER Packaged and Split HP's
	15 SEER Packaged and Split AC's
	15 SEER Packaged and Split HP's
	16 SEER Packaged and Split AC's
	16 SEER Packaged and Split HP's
	17 SEER Packaged and Split AC's
	17 SEER Packaged and Split HP's
	18 SEER Packaged and Split AC's
	18 SEER Packaged and Split HP's
	Air Cooled Chillers < 150 tons

Tucson Electric Power Company

DSM PROGRESS REPORT FOR THE PERIOD: January through December 2011

	Air Cooled Chillers > 150 tons
	EER Rated Packaged AC (> 20tons ,10.9 EER)
	EER Rated Packaged AC (11.5 - 20 tons ,11.24 EER)
	EER Rated Packaged AC (5.4 - 11.25 tons ,11.36 EER)
	EER Rated Packaged HP (> 20 tons ,11.11 EER)
	EER Rated Packaged HP (11.25 - 20 tons ,11.02 EER)
	EER Rated Packaged HP (5.4 - 11.25 tons ,11.31 EER)
	Programmable Thermostats
	Variable Speed Screw Compressor
	Water Cooled Chillers < 200 tons
	Water Cooled Chillers > 400 tons
	Water Cooled Chillers 201 - 400 tons
	Daylighting controls
	Delamping
	Energy efficient exit signs
	HIDs to T8/T5
	Integral Screw In CFL
	Occupancy sensors
	Screw in cold cathode CFL
	Standard T8 Lighting
	Energy efficient ODP motors
	Energy Efficient TEFC Motors
	Variable Speed Drives
	Anti-sweat heater controls
	High Efficiency Evaporator Fan Motors
	High Efficiency Ice Makers
	High Efficiency Reach-in Refrigerators and Freezers
	Strip Curtains and Night Covers
Small Business	Programmable Thermostats
	14 SEER Packaged and Split AC's
	14 SEER Packaged and Split HP's
	15 SEER Packaged and Split AC's
	15 SEER Packaged and Split HP's
	16 SEER Packaged and Split AC's
	16 SEER Packaged and Split HP's
	Daylighting controls
	Delamping
	Energy efficient exit signs
	Hard Wire CFL

Tucson Electric Power Company

DSM PROGRESS REPORT FOR THE PERIOD:
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	HIDs to T8/T5
	Integral Screw In CFL
	Occupancy sensors
	Screw in cold cathode CFL
	Standard T8 Lighting
	Variable Speed Drives
	Anti sweat heater controls
	Strip Curtains and Night Covers
Efficient Commercial Building Design	New Commercial Construction
	Design Assistance
C & I Demand Response	Demand Response/Direct Load Control
Support Programs	
Home Energy Reports	Home Energy Reports

Tucson Electric Power Company

DSM PROGRESS REPORT FOR THE PERIOD:
January through December 2011

APPENDIX 3 – CFL SALES AND WATTAGE INFORMATION

Units	Watts	Watts Replaced	Watts Saved	Hours/Day	Meas Life	Unit kWh Annual	kWh Annual @ Meter	kWh Annual @ Generator
2,541	7	40	33	2.90	6.0	33.0	88,705	97,132
38,552	9	40	31	2.90	6.0	31.0	1,264,269	1,384,374
22,908	10	40	30	2.90	6.0	30.0	727,008	796,074
25,475	11	40	29	2.90	6.0	29.0	781,525	855,770
381	11	45	34	2.90	6.0	34.0	13,704	15,005
831	11	50	39	2.90	6.0	39.0	34,284	37,541
274	12	60	48	2.90	6.0	48.0	13,913	15,235
460,711	13	60	47	2.90	6.0	47.0	22,906,422	25,082,532
2,564	14	50	36	2.90	6.0	36.0	97,645	106,922
245,107	14	60	46	2.90	6.0	46.0	11,927,361	13,060,460
8,344	14	65	51	2.90	6.0	51.0	450,169	492,935
24,770	15	60	45	2.90	6.0	45.0	1,179,151	1,291,170
3,498	16	65	49	2.90	6.0	50.0	181,320	198,546
57,198	15	65	50	2.90	6.0	50.0	3,025,392	3,312,804
709	15	75	60	2.90	6.0	60.0	45,002	49,277
98	16	65	49	2.90	6.0	49.0	5,080	5,562
62,832	18	75	57	2.90	6.0	57.0	3,788,668	4,148,591
54,407	19	75	56	2.90	6.0	56.0	3,223,099	3,529,293
27,686	20	75	55	2.90	6.0	55.0	1,610,845	1,763,875
929	23	90	67	2.90	6.0	67.1	65,845	72,100
204,433	23	100	77	2.90	6.0	77.1	16,652,235	18,234,198
13,176	23	120	97	2.90	6.0	97.1	1,352,029	1,480,472
2,755	26	90	64	2.90	6.0	64.1	186,523	204,243
498	26	95	69	2.90	6.0	69.1	36,350	39,804
33,384	26	100	74	2.90	6.0	74.1	2,613,370	2,861,640
4,722	27	120	93	2.90	6.0	93.1	464,558	508,691
33	30	125	95	2.90	6.0	95.1	3,316	3,631
1,435	32	150	118	2.90	6.0	118.1	179,129	196,146
35	33	150	117	2.90	6.0	117.1	4,332	4,743
1,026	42	150	108	2.90	6.0	108.1	117,220	128,356
1,301,312							73,038,469	79,977,123