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**BEFORE THE ARIZONA CORPORATION COMMISSION**

GARY PIERCE  
Chairman  
BOB STUMP  
Commissioner  
SANDRA D. KENNEDY  
Commissioner  
PAUL NEWMAN  
Commissioner  
BRENDA BURNS  
Commissioner

Arizona Corporation Commission  
**DOCKETED**  
APR - 7 2011

DOCKETED BY 

IN THE MATTER OF TUCSON ELECTRIC )  
POWER COMPANY'S APPLICATION FOR )  
APPROVAL OF ITS RESIDENTIAL BILL )  
COMPARISON PILOT PROGRAM )

DOCKET NO. E-01933A-07-0401  
DECISION NO. 72254  
ORDER

Open Meeting  
March 29 and 30, 2011  
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Tucson Electric Power Company ("TEP" or "the Company") is certificated to provide electric service as a public service corporation in the State of Arizona.

2. On July 12, 2010, the Arizona Corporation Commission ("Commission") issued Decision No. 71787 (Docket No. E-01933A-07-0401) which ordered TEP to "develop a bill comparison pilot program that will allow its customers to compare their energy usage with that of other similarly situated customers".

3. On August 25, 2010, TEP filed its Application for Approval of its Residential Bill Comparison Pilot titled the Home Energy Report Pilot Program ("Program").

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**PROGRAM DESCRIPTION**

4. The Program is designed to instigate behavioral changes in customers' energy consumption. The Program works by first making customers aware of their energy consumption and then allowing them to compare that usage to similarly situated homes.

5. The Program is designed to affect habitual behaviors like turning off the lights and adjusting the thermostat, purchasing behaviors such as buying efficient light bulbs and appliances, and participation levels in utility demand-side management ("DSM") programs by preparing reports that compare a customer's energy use to that of their neighbors.

6. The major objectives of 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 consumers' energy bills.

7. Customer privacy is assured through the manner in which the Program is designed, and by the use of strict non-disclosure contract language, and data security. Individual customers will only have access to their specific data and generic accumulated data by which they can make a comparison. The implementation contractor ("IC") is required to enter into a strict non-disclosure agreement preventing it from using customer data for any purpose outside of the Program.

8. OPOWER has been selected by TEP as the IC for the Program. OPOWER uses a multi-channel approach, as described below, employing normative messaging, to engage and motivate customer action as detailed below.

***Home Energy Report***

9. A Home Energy Report leverages cutting-edge behavioral science within a variety of motivating visual modules:

- Energy Use Comparison of one household to a similar set of "neighborhood peers." The module leverages a subtle psychological mechanism, such as smiley faces, to drive customers to action.
- Usage Analysis offers a more detailed look at household energy consumption, plus an actionable insight (e.g., "Your energy use is particularly high, compared to

1 others, during hot summer days”). OPOWER’S patented software can also suggest  
2 the likely causes of high usage.

- 3 • Targeted Tips on the back of the Home Energy Report encourage immediate  
4 energy-saving behavior. Advice can be tailored to customer demographics and the  
5 household’s previous response, such as taking advantage of an EnergyStar  
6 refrigerator rebate.
- 7 • Promotional Offers for other utility programs can be shared with customers in their  
8 Home Energy Report. Such promotions in other jurisdictions have driven up  
9 program participation by more than 20%, at no additional marketing cost to the  
10 utility.

11 10. Reports will be provided to customers approximately six times per year.

12 ***OPOWER Efficiency Portal***

13 11. OPOWER’s Energy Efficiency Portal provides an interactive medium that allows  
14 customers to explore their energy use in greater detail by giving them access to additional insight-  
15 oriented energy-use displays. Customers can browse OPOWER’s database of actionable efficiency  
16 tips and have the ability to provide feedback into the system, be it household-specific information  
17 or best-practice sharing.

18 12. OPOWER’s energy portal is tightly integrated with its home energy reports which  
19 encourage customers to access the portal. The information collected from online visitors enriches  
20 subsequent reports with user-generated content that’s relevant down to the neighborhood level.

21 13. The portal features a range of interactive modules designed to engage, educate, and  
22 motivate utility customers, including:

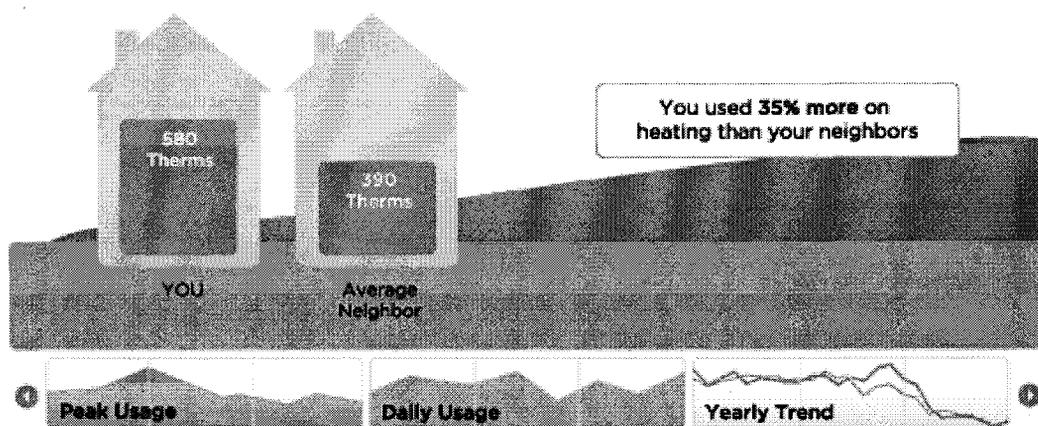
- 23 • Energy Efficiency Tips – Users can easily browse OPOWER’s database of energy-  
24 saving advice, pursue any of the tips, provide comments others can see, and report  
25 any actions they’ve already taken.
- 26 • Insight-Driven Data Displays – OPOWER’s interactive dashboards are designed to  
27 be intuitive and simple, leaving the underlying data to statistical engines running in  
28 the background, giving users only the most actionable information.

- 1 • 30-Second Home Audit – OPOWER offers a 30-second, “quick click” online audit  
2 which asks questions in modules (e.g., heating, cooling, appliances, etc.) that most  
3 customers can answer with ease.
- 4 • Best-Practice Sharing – OPOWER encourages users to “brag” about their energy-  
5 saving actions. The commentary of a few is shared for the benefit of all.
- 6 • Understanding The Bill – All energy-use data displays can be shown in dollars as  
7 well as in kWhs. The displays are a natural extension of a utility’s online bill  
8 presentation, helping customers understand the drivers behind their high bills and  
9 what they can do to lower them. Customers can also see what their most efficient  
10 neighbors are doing to keep their bills low.

### 11 *Online Energy Insight Module*

12 14. Figure 1, below, is an example of an OPOWER online insight module. Their patent-  
13 pending analytics engine extrapolates specific insights about household usage patterns, which are  
14 then communicated to the customer in a way that motivates customer action.

15 **Figure 1: OPOWER Online Insight Module Example**



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24 15. Before OPOWER’s Home Energy Reporting program is deployed in a new region,  
25 households with statistically equivalent demographic profiles and past consumption patterns are  
26 randomly divided into two groups – the treatment group and the control group. Both groups are  
27 exposed to the same local weather, energy prices, and economic environment. The only  
28 statistically meaningful difference between the groups is that the treatment group receives Home

1 Energy Reports while the control group does not. The first Home Energy Report will inform the  
2 customer that they've been chosen to participate in the pilot program and explain why TEP is  
3 beginning this Program.

#### 4 **PROGRAM IMPLEMENTATION**

5 16. During the initial years of the Program, TEP will use a phased approach to program  
6 implementation, as described below.

- 7 • Phase 1: A limited version of the program will be designed and will include a  
8 treatment group and a control group, totaling 25,000 customers. Both groups will  
9 consist of residential customers that exhibit above-average energy consumption.  
10 These groups will likely include customers whose use is 15,000 kWh per year or  
11 greater. Average TEP residential customers use about 11,000 kWh per year.
- 12 • Phase 2: OPOWER will conduct an evaluation of first-year Program participants as  
13 well as the control group to assess the effectiveness of the Program. Program  
14 results will be analyzed with the Program design refined according to the findings  
15 of the evaluation.
- 16 • Phase 3: During the third phase, participation in the Program is planned to increase  
17 to a total of 40,000 customers in the second full year of implementation.
- 18 • Phase 4: An in-depth evaluation strategy is a required element of the Program; an  
19 independent measurement and evaluation component will be utilized to achieve  
20 such an evaluation.

21 17. The control group will be statistically equivalent to the treatment group. After an  
22 initial eligibility screening process, customers will be randomly assigned to either the treatment or  
23 control group. Customers that wish to opt-in to the program will receive Home Energy Reports  
24 but will not be part of either the control or treatment groups.

#### 25 **PROGRAM DELIVERY AND ADMINISTRATION**

26 18. OPOWER is expected to deliver a turn-key program and will have responsibility for  
27 all aspects of customer selection, report generation, Program evaluation, energy savings  
28 calculations, customer communications and reporting.

1           19.     TEP will provide assistance on the design of the Home Energy Report products for  
2 appearance, readability, content, and marketing of other available energy efficiency programs.  
3 TEP will also provide OPOWER with the customer and usage history information necessary to  
4 generate the reports.

### 5 MARKETING

6           20.     Although Home Energy Report products will be delivered to the target market by  
7 OPOWER, TEP will jointly develop the marketing message contained in the Home Energy  
8 Reports. There is no direct marketing done by TEP for the Program; however, the Program will be  
9 included in the integrated marketing approach TEP has developed and uses for all DSM measures.

### 10 PROGRAM BUDGET

11           21.     Table 1, below, represents the 2011 budget provided by OPOWER plus TEP's  
12 internal costs for 2011. TEP intends to include the costs of the Program in its upcoming annual  
13 DSM charge adjustment. Based on updated budget information provided by TEP subsequent to  
14 the filing of the application for approval of this Program, Staff estimates that the Program will  
15 result in a \$0.0000413 per kWh increase to the DSM charge, which would be an increase in the  
16 average residential bill of \$0.45 per year.

17 **Table 1. Home Energy Reports Program Budget (2011)**

18 Measure	19 Maximum Cost/ Customer	20 Units	21 Total
22 <b>Home Energy Reports</b>	\$9.90	25,000	<b>\$247,500</b>
23 <b>Program Delivery</b>			
24     -Utility Program Delivery			\$39,000
25     -Other Direct Costs (Office Expenses, 26     Travel, Training, Software, License Fees, etc)			\$5,000
27     -One-time Set-up Fee			\$21,438
28     -On-going Set-up and Management			\$12,250
<b>Subtotal Program Delivery</b>			<b>\$77,688</b>
<b>Internal Program Marketing</b>			<b>\$16,259</b>
<b>Utility Program Administration</b>			<b>\$26,000</b>
<b>Measurement, Evaluation, and Research</b>			<b>\$14,698</b>
<b>Program Total</b>			<b>\$382,145</b>

## PROGRAM PARTICIPATION

22. TEP plans to have 25,000 customers participating in the program (ie., in the treatment group) during 2011, the first year of implementation, with participation increasing to 40,000 customers in the second year of implementation.

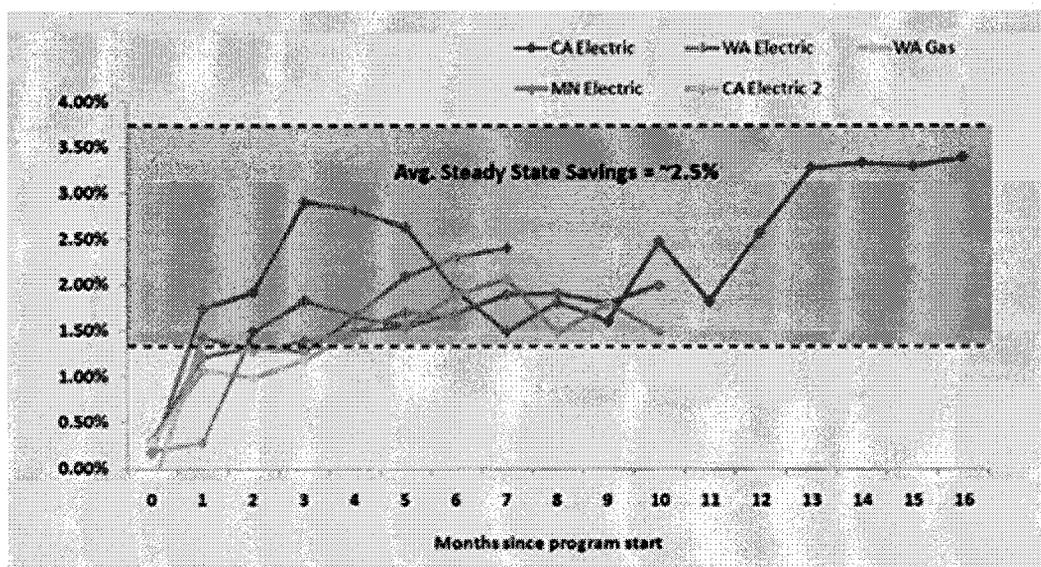
23. Customers who would like to opt-in to the program can contact TEP and will receive Home Energy Reports twice a year. These customers will not be included in the treatment or control groups for measurement purposes.

24. Customers designated to participate in the Program will be able to fully opt out of the Program (or switch from mailed paper reports to emailed reports) at any time by calling the TEP customer service number provided on the mailed Home Energy Reports and web portal. Customers can also opt out of the Program directly through the Home Energy Reporting web portal or by sending an email to the TEP customer service center.

## ESTIMATED ENERGY SAVINGS AND ENVIRONMENTAL BENEFITS

25. According to OPOWER, in every utility area where the Home Energy Reporting system has been implemented, it has consistently delivered between 1.5% and 3.5% in average energy savings across the targeted population, as demonstrated in Figure 2.

**Figure 2. OPOWER Program Savings Over Time**



1 Table 2 illustrates the energy savings TEP anticipates from the Program. Given these anticipated  
 2 savings on a household basis, the Program is anticipated to save 7,500 MWh in the first year of  
 3 implementation.

4 **Table 2. Individual Energy and Demand Savings**

5 Base Annual Home Energy Consumption (kWh)	15,000
6 Number of Households Participating	25,000
7 Program Savings (% of Sales) <sup>1</sup>	2.0%
8 Demand Savings (kW)	0.034
9 Household Annual Energy Savings (kWh)	300

10  
 11 26. Table 3 displays the anticipated environmental benefits of the program. Because the  
 12 “measure life” of behavioral measures is estimated to be one year, annual environmental benefits  
 13 are the same as lifetime environmental benefits.

14 **Table 3. Environmental Benefits**

	Annual Metric Tons Reduced
16 CO <sub>2</sub>	9,103
17 NO <sub>x</sub>	12
18 SO <sub>x</sub>	11

19 **COST-EFFECTIVENESS**

20 27. The Commission’s 1991 Resource Planning Decision established the Societal Cost  
 21 Test (“SCT”) as the methodology to be used for determining the cost-effectiveness of a DSM  
 22 program. Under the SCT, in order to be cost-effective, the ratio of benefits to costs must be  
 23 greater than one. The societal costs for a DSM program include the cost of the measure and the  
 24 cost of implementing the program, excluding rebates. The societal benefits of a DSM program  
 25 include the avoided demand and energy costs as well as avoided environmental impacts, which are  
 26 quantified, but do not have to be monetized.

27  
 28 <sup>1</sup> The Sacramento Municipal Utility District began a pilot behavioral study with OPOWER in Spring 2008. Three separate evaluations of the program after the first year found 2.1% overall energy savings for program participants.

1           28. Staff has evaluated the Program, as proposed, and has found it to be cost-effective  
2 with a SCT benefit-to-cost ratio of 1.47.

3 **MONITORING AND EVALUATION**

4           29. TEP will use an independent third-party measurement, evaluation and research  
5 contractor to evaluate the energy savings from the Program. Because behavior-based initiatives  
6 must provide a highly reliable evaluation protocol, TEP is proactively designing a protocol that  
7 will measure the impacts of the following:

- 8           • The Boomerang Effect, whereby low-energy users respond to the home energy  
9 reports by increasing their energy consumption.
- 10          • The Growth/Decay Effect, to determine whether time has a growing (energy  
11 savings increase) or a decaying (energy savings erode) effect on the Program.
- 12          • Treatment Persistence, to determine whether energy savings persist after  
13 termination of the treatment (i.e., after the home energy reports stop).
- 14          • The Rebound Effect, which will determine whether, after an extended period  
15 without treatment, a household may respond to renewed treatment with a savings  
16 surge.

17          30. A sampling strategy will be used to allow for evaluation of these aspects of the  
18 Home Energy Report Program.

19 **RECOMMENDATIONS**

20          31. Staff has recommended that the Program be approved as a two-year pilot.

21          32. Staff has recommended that a measurement and evaluation report on the results of  
22 the Program be filed in this docket within 90 days of the evaluation of Phase 1, with proposals  
23 regarding continuation, termination, redesign or expansion. Such evaluation shall be filed no later  
24 than December 31, 2012.

25          33. Staff has recommended that the measurement and evaluation report include actual  
26 data in order to verify the cost-effectiveness of the program. After reviewing the report, Staff shall  
27 file a recommendation as to whether the program should be continued or terminated, along with  
28 any proposed conditions.



1 IT IS FURTHER ORDERED that if the pilot program is found to be cost-effective by the  
2 measurement and evaluation study, the program may be continued until further order of the  
3 Commission.

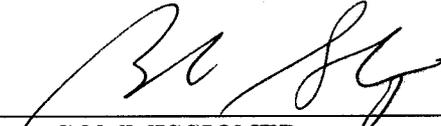
4 IT IS FURTHER ORDERED that the pilot also be used to gather data on the Program's  
5 impact on customer participation in other Tucson Electric Power Company DSM programs, and  
6 that this data be evaluated and provided as part of the measurement and evaluation report Tucson  
7 Electric Power Company provides to the Commission.

8 IT IS FURTHER ORDERED that customer privacy be carefully protected and that  
9 customers have a simple and clearly communicated avenue for opting out of participation, should  
10 they choose to do so.

11 IT IS FURTHER ORDERED that this decision become effective immediately.

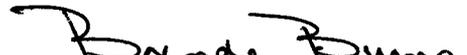
12 **BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

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14 \_\_\_\_\_  
CHAIRMAN

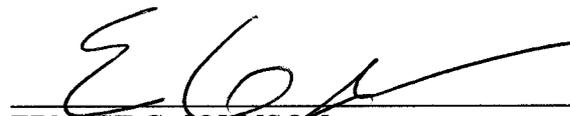
  
\_\_\_\_\_ COMMISSIONER

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COMMISSIONER

  
\_\_\_\_\_ COMMISSIONER

  
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18 IN WITNESS WHEREOF, I, ERNEST G. JOHNSON,  
19 Executive Director of the Arizona Corporation Commission,  
20 have hereunto, set my hand and caused the official seal of  
21 this Commission to be affixed at the Capitol, in the City of  
Phoenix, this 7<sup>th</sup> day of April, 2011.

22   
23 \_\_\_\_\_  
24 ERNEST G. JOHNSON  
EXECUTIVE DIRECTOR

25 DISSENT: \_\_\_\_\_

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27 DISSENT: \_\_\_\_\_

28 SMO:LAF:sms/RM

1 SERVICE LIST FOR: Tucson Electric Power Company  
2 DOCKET NO. E-01933A-07-0401

3 Mr. Michael Patten  
4 Roshka DeWulf & Patten, PLC  
5 One Arizona Center  
6 400 E. Van Buren St., Suite 800  
7 Phoenix, Arizona 85004

8 Mr. Philip Dion  
9 Ms. Melody Gilkey  
10 UniSource Energy Corporation  
11 One South Church Avenue, Suite 200  
12 Tucson, Arizona 85701-1623

13 Mr. Steven M. Olea  
14 Director, Utilities Division  
15 Arizona Corporation Commission  
16 1200 West Washington Street  
17 Phoenix, Arizona 85007

18 Ms. Janice M. Alward  
19 Chief Counsel, Legal Division  
20 Arizona Corporation Commission  
21 1200 West Washington Street  
22 Phoenix, Arizona 85007

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24  
25  
26  
27  
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