



0000133749

Regulatory Affairs Supervisor  
State Regulation

Mail Station 9708  
PO Box 53999  
Phoenix, Arizona 85072-3999  
Tel 602-250-2661  
Jeffrey.Johnson@aps.com

RECEIVED

2012 JAN 30 P 4: 22

AZ CORP COMMISSION  
DOCKET CONTROL

January 30, 2012

Docket Control  
Arizona Corporation Commission  
1200 W. Washington  
Phoenix, AZ 85007

RE: Arizona Public Service Company 2008 Amended Rate Case - Super Peak and  
Critical Peak Programs Impact Study Results  
Docket No. E-01345A-08-0172

Pursuant to Decision No. 71448, dated December 30, 2009, Arizona Public Service  
Company ("APS") was ordered as follows:

APS to prepare a study on the impact of its super peak and critical peak  
programs, study shall examine actual experience with APS's demand  
response programs and shall continue for 2 years. APS shall file reports  
as a compliance item in this docket outlining the study and describing  
the results of the study by 1/31/2011, a second report by 12/31/2011,  
and a final report within 30 days of the end of the study.

Enclosed please find APS's Super Peak and Critical Peak Programs Impact Study  
Results.

If you have any questions regarding this information, please contact Chuck Miessner at  
(602) 250-3081.

Sincerely,

Jeffrey W. Johnson

JJ/cd  
Attachment

cc: Brian Bozzo  
Steve Olea  
Terri Ford

Arizona Corporation Commission  
**DOCKETED**

JAN 30 2012

DOCKETED BY

**Arizona Public Service Company  
Demand Response Pricing Rates  
Final Report  
January 2012**

**In Compliance with Decision No. 71448,  
Docket No. E-01345A-08-0172**

**Arizona Public Service Company  
Demand Response Pricing Rates  
Final Report  
January 2012**

**In Compliance with Decision No. 71448,  
Docket No. E-01345A-08-0172**

## **Background**

In January 2010, APS implemented three new demand response pricing rates: residential super-peak time-of-use rate schedule ET-SP; residential critical peak pricing rate schedule CPP-RES; and general service critical peak pricing rate schedule CPP-GS. These demand response rates, which were approved in Decision No. 71448, are part of APS's plan to achieve an additional 250 MW of demand response.<sup>1</sup>

APS has conducted a two-year study of these plans over the 2010 and 2011 summer months. The first progress report filed in January 2011 provided a general outline of the study and the results from summer 2010. The second progress report provided the results for summer 2011. This is the final report and includes a summary of the results for the two program years, assessment of overall costs and benefits of the demand response rates, and assessment of the integration of demand response and energy efficiency programs.

## **Study Outline**

The demand response pricing study was designed to:

1. Determine the impact of the rates on participants' energy use during critical peak hours;
2. Assess the impact on the mix of power generation resources, including the use of coal-fired power resources;
3. Estimate the resulting reductions on air emissions including carbon dioxide, sulfur dioxide, nitrogen oxides, particulate matter, and mercury;
4. Evaluate the overall benefits of demand response programs; and
5. Identify methods to better integrate demand response programs and energy efficiency programs.

---

<sup>1</sup> See Decision No. 71448, Findings of Fact no. 89.

## **Program Description**

The demand response rates are designed to encourage customer load reduction by providing relatively high price signals during critical summer hours, when APS experiences high electric loads or high electric market prices as a result of major generation or transmission outages.

For ET-SP, super peak hours occur every weekday afternoon, and for CPP-RES and CPP-GS critical hours are intermittent and based on random called events.

ET-SP is similar to the APS's standard TOU rate, ET-2, with a 7 hour on-peak period, but adds a super peak price for weekday afternoons from 3 p.m. to 6 p.m. during June through August. The summer off-peak price is discounted to off-set the higher super peak price. The customer has the opportunity to have lower monthly bills by reducing load during either the on-peak or super-peak periods, or both.

CPP-RES and CPP-GS are in addition to the customer's standard rate plan and provide a high price for critical hours as called by the Company with one day advance notice. A discount is also applied to the customer's total monthly kWh to off-set this high price. Critical events may be invoked by the Company for the period 2 p.m. to 7 p.m. weekdays (Monday through Friday) during June through September, not including holidays. The Company will invoke a minimum of 6 and a maximum of 18 CPP events per calendar year, for 5 hours per event and 90 hours per year. Also, customers on CPP-GS must demonstrate the capability of reducing load by 200 kW prior to going on the rate schedule. The customer has the opportunity to lower monthly bills by reducing load during the critical peak event periods.

## **RESULTS**

### **Customer Participation**

For CPP-RES, an average of 683 customers participated in 2010 and 699 in 2011 for the June through September period. For ET-SP, 136 customers participated in 2010 and 304 in 2011 for June through August. Because of the success of CPP-RES, the Company filed an application in June 2011 to extend the program through 2014.

In contrast to CPP-RES and ET-SP, APS was not able to acquire business participants for CPP-GS. We believe that customers interested in demand response chose to participate in the alternative Peak Solutions program, which offered better monthly bill savings opportunities and less frequent load interruptions compared with CPP-GS. As a result, APS did not file for an application to extend the two year pilot program which ends December 31, 2011.

## Program Impacts

### A. Energy and Demand Use by Customers

#### CPP-RES

APS used a baseline approach to estimate customer load reduction. The customer baseline (CBL) was determined based on the customer's 2 p.m. to 7 p.m. usage for the day prior to a CPP event, not including weekends. The energy reduced is the CBL less actual load during a DR event.

For CPP-RES, APS found the average customer load reduction to be 0.91 kW for 2010 and 0.81 kW for 2011. The number of critical events called in 2010 was 6 versus 12 in 2011. The total estimated energy reduced over all critical event hours was 18.9 MWH for 2010 and 33.9 MWH for 2011.

#### ET-SP

To calculate the energy reduced for ET-SP customers, APS again used a CBL approach. To determine the CBL for ET-SP customers, APS used an indexed load shape from ET-2 customers, a good approximation for baseline time-of-use energy use. As with CPP-RES, energy reduction for ET-SP is calculated as the CBL less average load during the summer period.

For ET-SP, APS found the average customer load reduction to be 0.45 kW for 2010 and 1.39 kW for 2011. The total estimated energy reduced during the super peak period for 2010 was 24.3 MWH and 82.1 MWH for 2011.

### B. Air Emissions

Table 1 shows the estimated impact on emissions for 2010 and 2011. Because the programs are designed to reduce peak demand for the top 1-2% of hours in the year, the impact is very small compared to energy efficiency programs that would encompass all hours. The impacts on particulate matter and mercury are insignificant and therefore are not listed below.

**Table 1.**

<u>Air Pollutant</u>	<u>CPP-RES</u>	<u>CPP-GS</u>	<u>ET-SP</u>	<u>Total</u>
Sulfur Dioxide (lbs)	0.3	0	0.4	0.7
Nitrogen Oxide (lbs)	4.9	0	7.8	12.7
Carbon Dioxide (Mil lbs)	0.047	0	0.083	0.130

### C. Generation Resources

The average estimated MW reduction for both CPP-RES and ET-SP during critical summer hours was 0.65 MW for 2010 and 0.98 MW for 2011. This is about a 50% increase year-over-year in energy savings during the critical peak hours. The marginal generation resource that would be deferred from these programs is a 45 MW LMS 100 combustion turbine unit. It is unlikely that a coal generation unit would be impacted.

## Benefit and Costs

To evaluate the cost effectiveness of the CPP-RES and ET-SP programs, APS used the Program Administrator Test (PAT):

G = Generation Avoided Cost (Capacity & Energy)  
T = Transmission/Distribution Avoided Cost  
PC<sub>U</sub> = Program Costs to Utility (Program Planning, Marketing, O&M)  
R = Rebate Incentive Payments  
B<sub>PAT</sub> = Benefits of the Program  
C<sub>PAT</sub> = Costs of the Program  
BCR<sub>PAT</sub> = Benefit-Cost Ratio

$$B_{PAT} = G + T$$

$$C_{PAT} = PC_U + R$$

$$BCR_{PAT} = B_{PAT} / C_{PAT}$$

The lifecycle assumed for both programs was 15 years, with expected participation levels reaching 5000 customers per program by year 2018 and remaining flat thereafter. The avoided cost study included in the PAT was the same study as used in the 2012 DSM Implementation plan, which includes the avoided costs for environmental externalities. APS found that the benefit-cost ratio for the programs was calculated to be 1.55.

CPP-RES and ET-SP provides both APS and customers savings opportunities. Customers who participate can lower their monthly bills if they reduce or shifts usage during the peak hours. APS benefits by having reduced energy and capacity costs.

### Integration of Demand Response and Energy Efficiency Programs

APS has promoted different rates customers can take advantage of such as CPP-RES and ET-SP, as well as other time-of-use rates, and energy efficiency programs. A residential customer can integrate, for example, the high efficiency pool pump and seasonal timer measure with time-of-use rates. Another example of what the Company is doing that integrates demand response and energy efficiency programs is the Home Energy Information Pilot (HEIP). Customers who participate in HEIP can view their usage during the day and make decisions to either reduce or shift usage. The customer also has the option to allow APS to control part of their load through this program. Both the pool pump and seasonal timer program and HEIP demonstrate how APS is promoting demand response and energy efficiency programs that can help customers save on their monthly bills and reduce system load requirements. We continue to evaluate ways that demand response rates, energy efficiency programs, and other customer options can work together to help customers save on their monthly bills.