



BEFORE THE ARIZONA CORPORATION COMMISSION

MIKE GLEASON  
Chairman  
WILLIAM A. MUNDELL  
Commissioner  
JEFF HATCH-MILLER  
Commissioner  
KRISTIN K. MAYES  
Commissioner  
GARY PIERCE  
Commissioner

Arizona Corporation Commission

DOCKETED

JUL 30 2007

DOCKETED BY NR

IN THE MATTER OF SMART METERING )  
REQUIREMENTS OF SECTION 1252 OF )  
THE ENERGY POLICY ACT OF 2005 )

DOCKET NO.E-00000A-06-0038

DECISION NO. 69736

ORDER

Open Meeting  
July 24 and 25, 2007  
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

Introduction

1. The Energy Policy Act of 2005 requires each state regulatory authority to consider certain PURPA<sup>1</sup> standards, including one on Time-based Metering and Communications, included in the section entitled Smart Metering. The Commission may decline to implement the standard or adopt a modified standard. The Commission was required to begin its consideration by August 8, 2006, and must complete its consideration by August 8, 2007. On January 23, 2006, Staff filed a memo in Docket Control to open a docket on Smart Metering.

2. A workshop was held on June 7, 2007. Participants in the Workshops included representatives from utilities, government agencies, advocates for renewable resources, product

...

<sup>1</sup> Public Utility Regulatory Policies Act of 1978.

1 suppliers, and others. Written comments were received by Arizona Public Service Company  
2 (“APS”), and Tucson Electric Power Company (“TEP”)/UNS Electric, Inc.

3 **PURPA Standard on Time-Based Metering and Communications**

4 3. In Section 1252 Smart Metering, the Energy Policy Act of 2005 (EPACT) requires  
5 each state regulatory authority to consider a PURPA standard on Time-based Metering and  
6 Communications. The standard would apply to utilities with greater than 500,000 MWh in annual  
7 retail sales. The Commission may decline to implement the standard or adopt a modified standard.

8 The standard is as follows:

9 (14) *TIME-BASED METERING AND COMMUNICATIONS.* –

10 (A) *Not later than 18 months after the date of enactment of this paragraph,*  
11 *each electric utility shall offer each of its customer classes, and provide*  
12 *individual customers upon customer request, a time-based rate schedule*  
13 *under which the rate charged by the electric utility varies during different*  
14 *time periods and reflects the variance, if any, in the utility's costs of*  
15 *generating and purchasing electricity at the wholesale level. The time-*  
16 *based rate schedule shall enable the electric consumer to manage energy*  
17 *use and cost through advanced metering and communications technology.*

18 (B) *The types of time-based rate schedules that may be offered under the*  
19 *schedule referred to in subparagraph (A) include, among others –*

20 (i) *time-of-use pricing whereby electricity prices are set for a*  
21 *specific time period on an advance or forward basis, typically not*  
22 *changing more often than twice a year, based on the utility's cost of*  
23 *generating and/or purchasing such electricity at the wholesale level*  
24 *for the benefit of the consumer. Prices paid for energy consumed*  
25 *during these periods shall be pre-established and known to*  
26 *consumers in advance of such consumption, allowing them to vary*  
27 *their demand and usage in response to such prices and manage their*  
28 *energy costs by shifting usage to a lower cost period or reducing*  
*their consumption overall;*

(ii) *critical peak pricing whereby time-of-use prices are in effect*  
*except for certain peak days, when prices may reflect the costs of*  
*generating and/or purchasing electricity at the wholesale level and*  
*when consumers may receive additional discounts for reducing peak*  
*period energy consumption;*

(iii) *real-time pricing whereby electricity prices are set for a specific*  
*time period on an advanced or forward basis, reflecting the utility's*  
*cost of generating and/or purchasing electricity at the wholesale*

1                    *level, and may change as often as hourly; and*

2                    *(iv) credits for consumers with large loads who enter into pre-*  
 3                    *established peak load reduction agreements that reduce a utility's*  
 4                    *planned capacity obligations.*

5                    *(C) Each electric utility subject to subparagraph (A) shall provide each*  
 6                    *customer requesting a time-based rate with a time-based meter capable of*  
 7                    *enabling the utility and customer to offer and receive such rate,*  
 8                    *respectively.*

9                    4.        Although the 18-month utility compliance deadline contained in paragraph A of the  
 10                    standard appears to be in conflict with the two-year statutory deadline for the Commission to  
 11                    consider the standard, the Commission can modify the utility compliance deadline in the standard  
 12                    to be a different time period.

13                    5.        In addition, there is a related provision in the Energy Policy Act of 2005 which  
 14                    states the following:

15                    (i)        *TIME-BASED METERING AND COMMUNICATIONS. - In*  
 16                    *making a determination with respect to the standard established*  
 17                    *by section 111(d)(14), the investigation requirement of section*  
 18                    *111(d)(14)(F) shall be as follows: Each State regulatory*  
 19                    *authority shall conduct an investigation and issue a decision*  
 20                    *whether or not it is appropriate for electric utilities to provide*  
 21                    *and install time-based meters and communications devices for*  
 22                    *each of their customers which enable such customers to*  
 23                    *participate in time-based pricing rate schedules and other*  
 24                    *demand response programs.*

25                    6.        The Commission is required to consider the three purposes of PURPA in its  
 26                    determination of whether to adopt the Time-based Metering and Communications standard. The  
 27                    three purposes of PURPA are as follows:

- 28                    •        conservation of energy supplied by electric utilities,
- optimal efficiency of electric utility facilities and resources, and
- equitable rates for electric consumers

29                    ...

30                    ...

31                    ...

1           7.       Information regarding the timing of electric usage may enable customers to modify  
2 usage patterns, and the associated price signals may provide an incentive to modify usage patterns  
3 or to conserve. When customers shift load to lower cost periods, utilities may utilize their facilities  
4 more efficiently. Electric rates can become more equitable for customers by charging prices that  
5 are more in line with the underlying cost at the time of consumption. However, both the benefits  
6 and the costs of Advanced Metering and Communications should be considered before requiring  
7 full-scale implementation.

8       **Background**

9           8.       EPACT uses all of these terms: "Advanced Metering and Communications," "Smart  
10 Metering," and "Time-based Metering and Communications."

11          9.       Advanced Metering and Communications is usually known as Advanced Metering  
12 Infrastructure (AMI). AMI should not be confused with Automated Meter Reading (AMR) which  
13 only refers to the meter reading process which includes drive-by and hand-held meter reading  
14 systems. AMR meters have one-way communication. AMI is a fixed network system that can  
15 read meters at any time and support a variety of complex rates.

16          10.      A Smart Meter can be defined as an interval meter with two-way communication  
17 capability that can relay data from the meter to the utility or vice versa. The end-point devices  
18 must be capable of being upgraded remotely, and the interval data need to be collected at least  
19 daily. However, the functionality of AMI can also be achieved with a "dumb" meter/smart  
20 network by moving the processing out of the meters and into the communication network to be  
21 shared by many meters.

22          11.      Capabilities of Smart Meters and AMI include on-demand meter reading, outage  
23 management, critical peak pricing support, direct load control program support, demand response  
24 program support, pre-paid metering support, virtual disconnects, and others.

25          12.      Time-based Metering and Communications consists of meters and systems that  
26 enable customers to participate in time-of-use (TOU), critical peak pricing (CPP), or real-time  
27 pricing (RTP) programs by either recording consumption during specific time periods or providing  
28 information to customers about market costs at specific times.

1 **Discussion and Analysis**

2 13. Some Arizona electric distribution utilities already offer time-based rates to their  
3 customers, and some of those utilities have already begun to introduce AMI in their service areas.  
4 The AMI technology varies substantially among the utilities. It appears that one technology may  
5 be most feasible for a densely populated area, but a different technology would be used in a rural  
6 area.

7 14. APS has begun implementation of an AMI system that consists of a cellular  
8 wireless public network with hub meters and client meters. Each hub meter is in contact with  
9 multiple client meters. These meters are considered Smart Meters. TEP has begun using a dumb  
10 meter/smart network approach. It uses one-way communications from the radio frequency meter  
11 but derives interval data which are passed back to the meter data management system. The  
12 investment is in the network rather than in the meter. Trico Electric Cooperative uses a cellular  
13 AMI system for its TOU, commercial, and interruptible customers. Trico's largest customers can  
14 obtain real time information through Trico's website. Half of Trico's meters are read remotely, and  
15 half are read using a drive-by system.

16 15. Both benefits and costs of AMI and time-based rates should be considered.  
17 Benefits of AMI include reduced meter reading costs, reduced meter reading access issues, ability  
18 to remotely program meters to facilitate rate changes, flexibility in billing cycles, and fewer field  
19 visits. Fewer field visits result in less mileage, reduced fuel consumption, fewer emissions, and  
20 possibly fewer vehicular accidents. AMI provides a tool for innovative rate design, a source for  
21 load data and system planning data, a gateway for future services the utility may choose to  
22 provide, increased reliability because of outage and restoration notification, a decrease in energy  
23 theft with the ability of looking at energy patterns, and a change in the utility mindset from re-  
24 active to pro-active.

25 16. Costs of AMI can include the costs for the meters, meter installation, a Meter Data  
26 Management System, data management labor, communications, back office software and servers,  
27 the integration of the AMI system to other systems, repairs to customer equipment, and other  
28 associated costs. As of February 2007, APS had purchased 29,872 AMI meters at an average cost

1 of about \$97 per meter. The communication cost per AMI meter was about \$0.15 per month,  
2 compared to a meter read cost of about \$0.90 per conventional meter. During a six-month period,  
3 APS spent about \$700,000 for integration of the AMI system and the Customer Information  
4 System.

5 17. AMI represents a significant investment by utilities and is still an evolving  
6 technology. Utilities should investigate their needs and those of their customers to determine if the  
7 benefits of AMI outweigh the costs and which AMI technology would be most appropriate to use.

8 18. Benefits of time-based rates may include an improved load shape for the utility with  
9 a reduced peak and the potential to defer capacity construction, increased reliability, better  
10 alignment of rates to costs, mitigation of price increases, an ability for the customer to save,  
11 increased customer satisfaction, and potential environmental benefits. Negative outcomes of time-  
12 based rates could include increased off-peak usage, increased load on the call center, and customer  
13 dissatisfaction.

14 19. Costs related to TOU include costs for meters, meter installation, meter reading,  
15 back office and operational support, customer education, marketing, training customer service  
16 staff, and other items. TEP has found the cost to read a TOU meter manually to be \$2.24 per read,  
17 compared to \$0.56 for the aggregated meter read cost for all meter reads within the TEP service  
18 territory. Changes to the TOU rates require reprogramming the meter through field visits. The  
19 costs for CPP include all of the costs for TOU plus the costs for communication to customers, the  
20 costs for the collection of interval data (including the costs for the interval meters, the costs for  
21 obtaining the data, and additional back-office cost to process the data), costs for increased  
22 customer education, and acceleration of depreciation of meter stock. Costs for RTP include the  
23 costs for TOU and CPP plus higher costs for communication to customers.

24 20. Utilities should offer voluntary time-based rate schedules that can provide benefits  
25 to both customers and utilities. However, each utility should be allowed to determine which  
26 type(s) of time-based rate schedules are appropriate for which customer classes in its area.

27 ...

28 ...

1 Staff Recommendations

2 21. Staff recommends that the Commission adopt a modified version of the PURPA  
3 standard on Time-based Metering and Communications.

4 22. The modified standard would be as follows:

5 (14) *TIME-BASED METERING AND COMMUNICATIONS.* –

6 *(A) ~~Not later than 18 months after the date of enactment of this paragraph,~~*  
7 *~~Within 18 months of Commission adoption of this standard, each electric~~*  
8 *~~distribution utility shall offer to appropriate customer classes, and provide~~*  
9 *~~individual customers upon customer request, a time-based rate schedule~~*  
10 *~~under which the rate charged by the electric utility varies during different~~*  
11 *~~time periods and reflects the variance, if any, in the utility's costs of~~*  
12 *~~generating and purchasing electricity at the wholesale level. Within 18~~*  
13 *~~months of Commission adoption of this standard, each electric distribution~~*  
14 *~~utility shall investigate the feasibility and cost-effectiveness of~~*  
15 *~~implementing advanced metering infrastructure for its service territory~~*  
16 *~~and shall begin implementing the technology if feasible and cost-effective.~~*  
17 *~~The time-based rate schedule shall enable the electric consumer to~~*  
18 *~~manage energy use and cost through advanced metering and~~*  
19 *~~communications technology.~~*

20 (B) *The types of time-based rate schedules that may be offered under the*  
21 *schedule referred to in subparagraph (A) include, among others-*

22 (i) *time-of-use pricing whereby electricity prices are set for a*  
23 *specific time period on an advance or forward basis, typically not*  
24 *changing more often than twice a year, based on the utility's cost of*  
25 *generating and/or purchasing such electricity at the wholesale level*  
26 *for the benefit of the consumer. Prices paid for energy consumed*  
27 *during these periods shall be pre-established and known to*  
28 *consumers in advance of such consumption, allowing them to vary*  
*their demand and usage in response to such prices and manage their*  
*energy costs by shifting usage to a lower cost period or reducing*  
*their consumption overall;*

(ii) *critical peak pricing whereby time-of-use prices are in effect*  
*except for certain peak days, when prices may reflect the costs of*  
*generating and/or purchasing electricity at the wholesale level and*  
*when consumers may receive additional discounts for reducing peak*  
*period energy consumption;*

(iii) *real-time pricing whereby electricity prices are set for a specific*  
*time period on an advanced or forward basis, reflecting the utility's*  
*cost of generating and/or purchasing electricity at the wholesale*  
*level, and may change as often as hourly; and*



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

ORDER

IT IS THEREFORE ORDERED that a modified version of the PURPA standard on Time-based Metering and Communications, as included in Finding of Fact No. 22, that would apply to all electric distribution companies in Arizona that are regulated by the Commission is adopted.

IT IS FURTHER ORDERED that this Decision shall become effective immediately.

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

  
CHAIRMAN

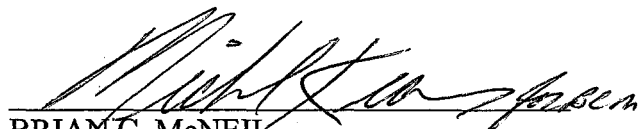
  
COMMISSIONER

COMMISSIONER

  
COMMISSIONER

  
COMMISSIONER

IN WITNESS WHEREOF, I BRIAN C. McNEIL, Executive Director of the Arizona Corporation Commission, have hereunto, set my hand and caused the official seal of this Commission to be affixed at the Capitol, in the City of Phoenix, this 30th day of JULY, 2007.

  
BRIAN C. McNEIL  
Executive Director

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

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

EGJ:BEK:lh\RM

1 SERVICE LIST FOR: Smart Metering  
2 DOCKET NO. E-00000A-06-0038

3 Ajo Improvement Company  
4 Post Office Drawer 9  
5 Ajo, Arizona 85321

6 Arizona Public Service Company  
7 Post Office Box 53999  
8 Station 9905  
9 Phoenix, Arizona 85072

10 Columbus Electric Cooperative, Inc.  
11 Post Office Box 631  
12 Deming, New Mexico 88031

13 Dixie-Escalante Rural Electric Association, Inc.  
14 71 East Highway 56  
15 Beryl, Utah 84714-5197

16 Garkane Energy Cooperative, Inc.  
17 Post Office Box 465  
18 Loa, Utah 84747

19 Graham County Electric Cooperative, Inc.  
20 Post Office Drawer B  
21 Pima, Arizona 85543

22 Mohave Electric Cooperative, Inc.  
23 Post Office Box 1045  
24 Bullhead City, Arizona 86430

25 Morenci Water and Electric Company  
26 Post Office Box 68  
27 Morenci, Arizona 85540

28 Navopache Electric Cooperative, Inc.  
1878 West White Mountain Boulevard  
Lakeside, Arizona 85929

Sulphur Springs Valley Electric Cooperative, Inc.  
Post Office Box 820  
Willcox, Arizona 85644

Trico Electric Cooperative, Inc.  
Post Office Box 930  
Marana, Arizona 85644

1 Ms. Jana Brandt  
Regulatory Affairs and Contracts  
2 Salt River Project  
Mail Station PAB221  
3 Post Office Box 52025  
4 Phoenix, Arizona 85072-2025

5 Ms. Kelly Barr  
Regulatory Affairs and Contracts  
6 Salt River Project  
Mail Station PAB221  
7 Post Office Box 52025  
8 Phoenix, Arizona 85072-2025

9 Mr. David Couture  
Director, Regulatory Services  
10 UNS Electric, Inc.  
Post Office Box 711  
11 Tucson, Arizona 85072-0711

12 Mr. Marc Jerden  
13 Senior Legal Counsel  
UNS Electric, Inc.  
14 Post Office Box 711  
15 Tucson, Arizona 85072-0711

16 Mr. Ernest G. Johnson  
Director, Utilities Division  
17 Arizona Corporation Commission  
1200 West Washington  
18 Phoenix, Arizona 85007

19 Mr. Christopher C. Kempley  
20 Chief Counsel  
Arizona Corporation Commission  
21 1200 West Washington  
22 Phoenix, Arizona 85007

23  
24  
25  
26  
27  
28

