

ORIGINAL

# OPEN MEETING



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## MEMORANDUM

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Arizona Corporation Commission

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2011 JUN 28 P 4:00

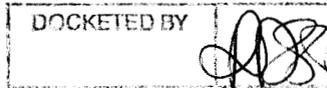
TO: THE COMMISSION

FROM: Utilities Division

JUN 28 2011

AZ CORP COMMISSION  
DOCKET CONTROL

DATE: June 28, 2011



RE: ARIZONA PUBLIC SERVICE COMPANY - APPLICATION FOR APPROVAL OF REVISIONS TO SERVICE SCHEDULE 8 - BILL ESTIMATION (DOCKET NO. E-01345A-10-0377)

On September 13, 2010, Arizona Public Service Company ("APS" or "Company") filed for approval of proposed revisions to its bill estimation tariff Service Schedule 8 ("Schedule 8"). On June 3, 2011, APS revised its filing. APS' Schedule 8 contains procedures for estimating kWh (energy) and kW (demand) when a complete and valid meter read cannot be obtained due to circumstances such as severe weather, equipment malfunctions, emergencies or dangerous conditions.

APS' proposed changes to Schedule 8 are needed to estimate kWh usage for missing interval "smart meter" data and accommodate for example, new six-part time-of-use ("TOU") rate schedules as discussed below.

The Arizona Corporation Commission ("Commission") approved two TOU rate schedules in Decision No. 71871 to serve private and public elementary and secondary schools (K-12) as follows: 1) Rate Schedule GS-Schools M serves average monthly maximum demand loads of less than or equal to 400 kW per month; and, 2) Rate Schedule GS-Schools L serves average monthly maximum demand loads of greater than 400 kW, but less than 3,000 kW per month. Both schedules contain new six-part pricing structures that provide time differentiated prices for three time periods per day (on-peak, shoulder-peak, and off-peak) and three seasons per year (summer-peak, summer shoulder-peak, and winter-peak). The meters used to develop the schools' TOU billing data are considered to be "smart meters".

### Staff Findings

The Company indicates that it is required to use its advanced metering infrastructure ("AMI") and smart meters to properly bill interval-metered kWh data consisting of six separate time periods. APS' typical TOU meters cannot readily record the six separate time periods needed for billing. The six-part rate structure also requires the Company to amend its methods for estimating customers' monthly bills should it become necessary to estimate invalid or missing interval meter data. Interval metering data are read hourly or more frequently, compared to the monthly data reads typically taken for most existing TOU and non-TOU meters.

According to APS' application<sup>1</sup>, the Company proposes using total monthly kWh data obtained from total monthly register reads (not interval kWh data) to estimate off-peak kWh consumption for schools billed under the GS-Schools M and L rate schedules. APS' proposed off-peak estimation methodology would be accomplished by subtracting on-peak and shoulder-peak interval kWh data for the period from total actual monthly kWh usage to derive off-peak monthly kWh. APS' proposed monthly residual off-peak kWh estimation methodology may be summarized as: *[Total Monthly Non-Interval kWh] less [On-Peak and Shoulder-Peak Interval kWh] = Off-Peak billing kWh.*

In cases where kWh estimates involve 3 percent<sup>2</sup> or less of relevant kWh usage, APS proposes that the estimated kWh be included in a proposed off-peak billing kWh residual category as proposed under Schedule 8 guidelines (Section 3.1.4) applicable to rate schedules GS-Schools M and L.

In cases where more than 3 percent of relevant interval data (on-peak and shoulder-peak kWh consumption) is missing, APS proposes using the standardized validating, editing, and estimating ("VEE") process to estimate the kWh billing determinants.

The Company indicates that VEE-based estimates of monthly interval billing determinants are also needed for other Commission-approved rate schedules that are currently in effect (i.e. critical peak pricing rates for business and residential customers). APS points out that VEE processes are being used throughout the utility industry for quality control and estimation of interval billing data. Staff confirmed that Tucson Electric Power Company ("TEP") is using the VEE process to estimate interval data. The proposed blending of the VEE bill estimation process with bill estimation methodologies already in effect under Section R14-2-210 of the Arizona Administrative Code was viewed by TEP as a move that would make clear the distinction between monthly consumption reads and interval reads.

A copy of APS' proposed section 3.1.4 of Schedule 8 is reproduced below.

#### 3.1.4 ENERGY ESTIMATION FOR MISSING INTERVAL DATA

For rate schedules where kWh billing determinants are derived from interval data, such as 15 minute or hourly intervals, and which are not specifically addressed elsewhere herein, the billing determinants shall be estimated through the standard validating, editing and estimating (VEE) process described below.

3.1.4.1 If any of the relevant interval billing data is missing in a billing period, the kWh billing determinants will be estimated as stated below, with the exception of section 3.1.4.1.1.

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<sup>1</sup> p. 1, L 25 – p. 2, L 2

<sup>2</sup> approximately 1 day per month

- Determine the kWh to be estimated: Compute the total kWh for the relevant time period by subtracting the start read from the stop read for that period, using the most recent reads. Sum the interval data for the same period to determine the kWh for the intervals having valid data. Compute the kWh for the interval data needing estimation (X): where (X) equals the total kWh for the period minus the kWh for the intervals with valid data.
- Determine the reference day(s): Select a reference day (or days) to provide an estimate of the load shape for the missing interval data. The reference day shall have a load shape that resembles the time period needing estimation. Weekday load shapes will be estimated with weekday reference days, weekends with weekend reference days. Holidays will be estimated with a weekend reference day.
- Replace the missing interval data with the reference day interval data for the same hour or sub-hour intervals of the day.
- Scale the reference day interval data: Sum the kWh for the reference day interval data that replaced the missing interval data (Y). Create a scale factor by dividing the kWh for the section needing estimation (X) by (Y). Multiply each estimated interval data point in the period by the (X/Y) scale factor.

3.1.4.1.1 For rate schedules GS-Schools M and GS-Schools L, the on-peak and shoulder-peak monthly billing kWh are derived from hourly interval data, while the off-peak monthly kWh is derived as the residual of the total kWh register read less the on-peak and shoulder-peak kWh. If 3% or less of the relevant combined on-peak and shoulder-peak interval data is missing in a billing period, the missing kWh will be included in the residual off-peak billing kWh. Otherwise the missing interval data will be estimated according to 3.1.4.1.

Staff verified that: a) VEE-related guidelines have been properly incorporated into APS' proposed Section 3.1.4; and, b) housekeeping changes proposed by APS (e.g. AMI references and typos) were properly made to the appropriate sections. Furthermore, APS originally proposed to insert electric vehicle ("EV") bill estimation references into proposed Schedule 8, thinking that the proposed EV program would have been approved by the Commission before the proposed Schedule 8 was reviewed by the Commission. However, Staff and APS later agreed to

remove EV references from proposed Schedule 8 in an effort to avoid a premature approval of EV-related bill estimation procedures.

**Staff Recommendations**

With the exception of APS' proposal to insert EV-related bill estimation guidelines into Schedule 8 as discussed above, Staff recommends approval of APS' proposed Schedule 8 as revised. Staff notes that APS' proposal to bill 3 percent or less of missing relevant interval data as off-peak kWh is an exclusive provision for rate schedules GS-Schools M and L. Accordingly, as interval billings become more prevalent, Staff also recommends that APS investigate the feasibility of offering similarly-situated rate classes similar opportunities to lower their monthly electric bills.

Although "AMI/smart meter/interval-derived kWh billings" are not dominant at this time, they are likely to increase substantially during the next few years. Staff references the following developments in support of this comment: 1) the Commission's recent approval of APS' Residential Home Energy Information Pilot (Decision No. 72214) is likely to accelerate the demand for AMI/smart meter technologies; and, 2) as reported by APS in its March 2011 AMI Plan Biannual Report, approximately 570,000 smart meters have been installed throughout APS' service territory. By the end of 2012, a total of more than 950,000 smart meters are expected to be installed in the metro Phoenix area and the more populated rural areas of APS' service territory. Given: a) the magnitude of existing and expected smart meter installations; b) the increased program/pilot opportunities approved by the Commission; and c) that APS' AMI technology is becoming more available throughout its service area, Staff believes that the need to estimate interval meter readings will increase in the relatively near future. Consequently, Staff supports APS' proposal to incorporate a VEE-based bill estimation process into its Schedule 8 as discussed herein.



for Steven M. Olea  
Director  
Utilities Division

SMO:WHM:lhm\SH

ORIGINATOR: William Musgrove

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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

IN THE MATTER OF THE APPLICATION )  
OF ARIZONA PUBLIC SERVICE )  
COMPANY FOR REVISIONS TO SERVICE )  
SCHEDULE 8 (BILL ESTIMATION) )

DOCKET NO. E-01345A-10-0377  
DECISION NO. \_\_\_\_\_  
ORDER

Open Meeting  
July 12 and 13, 2011  
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Arizona Public Service Company ("APS" or "Company") is certificated to provide electric service as a public service corporation in the State of Arizona.
2. On September 13, 2010, APS filed for approval of proposed revisions to its bill estimation tariff Service Schedule 8 ("Schedule 8"). On June 3, 2011, APS revised its filing. APS' Schedule 8 contains procedures for estimating kWh (energy) and kW (demand) when a complete and valid meter read cannot be obtained due to circumstances such as severe weather, equipment malfunctions, emergencies or dangerous conditions.
3. APS' proposed changes to Schedule 8 are needed to estimate kWh usage for missing interval "smart meter" data and accommodate for example, new six-part time-of-use ("TOU") rate schedules as discussed below.
4. The Arizona Corporation Commission ("Commission") approved two TOU rate schedules in Decision No. 71871 to serve private and public elementary and secondary schools (K-

1 12) as follows: 1) Rate Schedule GS-Schools M serves average monthly maximum demand loads  
 2 of less than or equal to 400 kW per month; and, 2) Rate Schedule GS-Schools L serves average  
 3 monthly maximum demand loads of greater than 400 kW, but less than 3,000 kW per month. Both  
 4 schedules contain new six-part pricing structures that provide time differentiated prices for three  
 5 time periods per day (on-peak, shoulder-peak, and off-peak) and three seasons per year (summer-  
 6 peak, summer shoulder-peak, and winter-peak). The meters used to develop the schools' TOU  
 7 billing data are considered to be "smart meters".

#### 8 **Staff Findings**

9 5. The Company indicates that it is required to use its advanced metering  
 10 infrastructure ("AMI") and smart meters to properly bill interval-metered kWh data consisting of  
 11 six separate time periods. APS' typical TOU meters cannot readily record the six separate time  
 12 periods needed for billing. The six-part rate structure also requires the Company to amend its  
 13 methods for estimating customers' monthly bills should it become necessary to estimate invalid or  
 14 missing interval meter data. Interval metering data are read hourly or more frequently, compared  
 15 to the monthly data reads typically taken for most existing TOU and non-TOU meters.

16 6. According to APS' application<sup>1</sup>, the Company proposes using total monthly kWh  
 17 data obtained from total monthly register reads (not interval kWh data) to estimate off-peak kWh  
 18 consumption for schools billed under the GS-Schools M and L rate schedules. APS' proposed off-  
 19 peak estimation methodology would be accomplished by subtracting on-peak and shoulder-peak  
 20 interval kWh data for the period from total actual monthly kWh usage to derive off-peak monthly  
 21 kWh. APS' proposed monthly residual off-peak kWh estimation methodology may be  
 22 summarized as: *[Total Monthly Non-Interval kWh] less [On-Peak and Shoulder-Peak Interval*  
 23 *kWh] = Off-Peak billing kWh.*

24 7. In cases where kWh estimates involve 3 percent<sup>2</sup> or less of relevant kWh usage,  
 25 APS proposes that the estimated kWh be included in a proposed off-peak billing kWh residual  
 26 ...

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<sup>1</sup> p. 1, L 25 – p. 2, L 2

<sup>2</sup> approximately 1 day per month

1 category as proposed under Schedule 8 guidelines (Section 3.1.4) applicable to rate schedules GS-  
2 Schools M and L.

3 8. In cases where more than 3 percent of relevant interval data (on-peak and shoulder-  
4 peak kWh consumption) is missing, APS proposes using the standardized validating, editing, and  
5 estimating (“VEE”) process to estimate the kWh billing determinants.

6 9. The Company indicates that VEE-based estimates of monthly interval billing  
7 determinants are also needed for other Commission-approved rate schedules that are currently in  
8 effect (i.e. critical peak pricing rates for business and residential customers). APS points out that  
9 VEE processes are being used throughout the utility industry for quality control and estimation of  
10 interval billing data. Staff confirmed that Tucson Electric Power Company (“TEP”) is using the  
11 VEE process to estimate interval data. The proposed blending of the VEE bill estimation process  
12 with bill estimation methodologies already in effect under Section R14-2-210 of the Arizona  
13 Administrative Code was viewed by TEP as a move that would make clear the distinction between  
14 monthly consumption reads and interval reads.

15 10. A copy of APS’ proposed section 3.1.4 of Schedule 8 is reproduced below.

16 3.1.4 ENERGY ESTIMATION FOR MISSING INTERVAL DATA

17 For rate schedules where kWh billing determinants are derived from interval  
18 data, such as 15 minute or hourly intervals, and which are not specifically  
19 addressed elsewhere herein, the billing determinants shall be estimated  
20 through the standard validating, editing and estimating (VEE) process  
21 described below.

22 3.1.4.1 If any of the relevant interval billing data is missing in a billing  
23 period, the kWh billing determinants will be estimated as stated below, with  
24 the exception of section 3.1.4.1.1.

- 25 • Determine the kWh to be estimated: Compute the total kWh for  
26 the relevant time period by subtracting the start read from the  
27 stop read for that period, using the most recent reads. Sum the  
28 interval data for the same period to determine the kWh for the  
intervals having valid data. Compute the kWh for the interval  
data needing estimation (X): where (X) equals the total kWh  
for the period minus the kWh for the intervals with valid data.
- Determine the reference day(s): Select a reference day (or days)  
to provide an estimate of the load shape for the missing interval



1 Accordingly, as interval billings become more prevalent, Staff has also recommended that APS  
2 investigate the feasibility of offering similarly-situated rate classes similar opportunities to lower  
3 their monthly electric bills.

4 13. Although "AMI/smart meter/interval-derived kWh billings" are not dominant at this  
5 time, they are likely to increase substantially during the next few years. Staff referenced the  
6 following developments in support of this comment: 1) the Commission's recent approval of  
7 APS' Residential Home Energy Information Pilot (Decision No. 72214) is likely to accelerate the  
8 demand for AMI/smart meter technologies; and, 2) as reported by APS in its March 2011 AMI  
9 Plan Biannual Report, approximately 570,000 smart meters have been installed throughout APS'  
10 service territory. By the end of 2012, a total of more than 950,000 smart meters are expected to be  
11 installed in the metro Phoenix area and the more populated rural areas of APS' service territory.  
12 Given: a) the magnitude of existing and expected smart meter installations; b) the increased  
13 program/pilot opportunities approved by the Commission; and c) that APS' AMI technology is  
14 becoming more available throughout its service area, Staff believes that the need to estimate  
15 interval meter readings will increase in the relatively near future. Consequently, Staff supports  
16 APS' proposal to incorporate a VEE-based bill estimation process into its Schedule 8 as discussed  
17 herein.

#### 18 CONCLUSIONS OF LAW

19 1. Arizona Public Service Company is a public service corporation within the meaning  
20 of Article XV, Section 2, of the Arizona Constitution.

21 2. The Commission has jurisdiction over Arizona Public Service Company and the  
22 subject matter of the application.

23 3. Approval of APS' proposed revisions to its Service Schedule 8 Bill Estimation, as  
24 modified, does not constitute a rate increase as contemplated by A.R.S. Section 40-250.

25 4. The Commission, having reviewed the revised application and Staff's  
26 Memorandum dated June 28, 2011, concludes that it is in the public's interest to approve the  
27 revisions to Service Schedule 8 Bill Estimation as discussed herein.

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ORDER

IT IS THEREFORE ORDERED that Arizona Public Service Company's application to revise its Service Schedule 8 Bill Estimation as revised and discussed herein is approved.

IT IS FURTHER ORDERED that as interval billings become more prevalent in Arizona Public Service Company's service area, the Company shall investigate the feasibility of offering similarly-situated rate classes similar opportunities to lower their monthly electric bills.

IT IS FURTHER ORDERED that Arizona Public Service Company's Service Schedule 8 Bill Estimation revisions, as approved, shall become effective on August 1, 2011.

1 IT IS FURTHER ORDERED that Arizona Public Service Company shall file, as a  
2 compliance item with Docket Control, a revised Service Schedule 8 Bill Estimation consistent with  
3 the Decision in this matter within 15 days from the effective date of the Decision.

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

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

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CHAIRMAN COMMISSIONER

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COMMISSIONER COMMISSIONER COMMISSIONER

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IN WITNESS WHEREOF, I, ERNEST G. JOHNSON,  
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 \_\_\_\_\_ day of \_\_\_\_\_, 2011.

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\_\_\_\_\_  
ERNEST G. JOHNSON  
EXECUTIVE DIRECTOR

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

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

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SMO:WHM:lhm\SH

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1 SERVICE LIST FOR: Arizona Public Service Company  
2 DOCKET NO. E-01345A-10-0377

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10 Arizona Corporation Commission  
11 1200 West Washington Street  
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