

ORIGINAL

OPEN MEETING AGENDA ITEM



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MEMORANDUM

TO: Docket Control

FROM: Ernest G. Johnson
Director
Utilities Division

EA for EGT

DATE: December 11, 2008

RE: INFORMATION IN RESPONSE TO COMMISSIONER PIERCE'S NOVEMBER 14, 2008 LETTER. ARIZONA ELECTRIC POWER COOPERATIVE (DOCKET NO: E-01773A-08-0333)

The attached information is being filed in response to the letter of Commissioner Pierce filed on November 14, 2008. The information requested was "a table listing of Arizona utilities' (1) yearly kWhs, (2) projected renewable energy costs and (3) projected renewable energy costs per kWh."

Table 1 lists each utility subject to the Renewable Energy Standard and Tariff ("REST") rules, by 2007 kWh sales, with the corresponding 2009 REST kWh requirement, 2009 projected utility budget, and cost per kWh of meeting the 2009 REST requirement. Table 2 lists the same type of information for the distributed portion of the REST requirement. Table 3 includes information for the non-distributed portion of the REST requirement.

Table 4 includes a different approach to cost analysis. It is a system life kWh cost analysis, using information from the proposed 2009 implementation plan of Arizona Public Service.

EGJ:BEK:tdp

Originator: Barbara Keene

Arizona Corporation Commission
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Table 1
Renewable Energy Standard Costs
by kWh Sales

| Utility | 2007 kWh Sales (from Annual Reports) | 2009 REST kWh Requirement (2%) | 2009 REST Cost (from Implementation Plans) | 2009 REST Cost per kWh |
|-----------------------------------|---|-----------------------------------|---|---------------------------|
| APS-Compliance Plan | 29,171,321,000 | 583,426,420 | \$78,400,000 | \$0.13438 |
| Current Funding | 29,171,321,000 | 583,426,420 | \$37,000,000 | \$0.06342 |
| Alternate Funding | 29,171,321,000 | 583,426,420 | \$47,200,000 | \$0.08090 |
| TEP-Full Compliance Plan | 9,634,406,796 | 192,688,136 | \$38,509,236 | \$0.19985 |
| Best Value Plan | 9,634,406,796 | 192,688,136 | \$17,010,199 | \$0.08828 |
| Staff Proposed Plan | 9,634,406,796 | 192,688,136 | \$29,686,056 | \$0.15406 |
| Morenci (with mining load) | 1,850,055,247 | 37,001,105 | \$2,408,469 | \$0.06509 |
| (without mining load) | 30,134,828 | 602,697 | \$158,169 | \$0.26244 |
| UNS Electric-Full Compliance Plan | 1,681,832,000 | 33,636,640 | \$6,460,086 | \$0.19206 |
| Best Value Plan | 1,681,832,000 | 33,636,640 | \$2,861,259 | \$0.08506 |
| Staff Proposed Plan | 1,681,832,000 | 33,636,640 | \$5,042,877 | \$0.14992 |
| AEPCO | 1,475,371,632 | 29,507,433 | \$1,364,058 | \$0.04623 |
| Duncan Valley | | | | |
| Graham County | | | | |
| Mohave | | | | |
| Trico | | | | |
| Sulphur Springs Valley | 796,093,821 | 15,921,876 | \$3,429,006 | \$0.21536 |
| Navopache | 410,360,000 | 8,207,200 | \$2,505,247 | \$0.30525 |
| Ajo Improvement | 12,630,592 | 252,612 | \$62,253 | \$0.24644 |

Table 2
Distributed Renewable Energy Standard Costs
by kWh Sales

| Utility | 2009 REST kWh Requirement | 2009 Distributed REST kWh Requirement (15%) | 2009 Distributed REST Cost | 2009 Distributed REST Cost per kWh |
|--|------------------------------|--|-------------------------------|---------------------------------------|
| APS-Compliance Plan ⁵ | 583,426,420 | 87,513,963 | \$66,250,000 | \$0.75702 |
| Current Funding ⁶ (80% of Distr. req.) | 583,426,420 | 70,011,170 | \$25,000,000 | \$0.35709 |
| Alternate Funding ⁵ | 583,426,420 | 87,513,963 | \$35,050,000 | \$0.40051 |
| TEP-Full Compliance Plan ¹ | 192,688,136 | 28,903,220 | \$30,992,444 | \$1.07228 |
| Best Value Plan ¹ | 192,688,136 | 28,903,220 | \$9,671,567 | \$0.33462 |
| Staff Proposed Plan ¹ | 192,688,136 | 28,903,220 | \$22,215,239 | \$0.76861 |
| Morenci (with mining load) | 37,001,105 | 5,550,166 | \$910,030 | \$0.16396 |
| (without mining load) | 602,697 | 90,404 | \$79,743 | \$0.88207 |
| UNS Electric-Full Compliance Plan ³ | 33,636,640 | 5,045,496 | \$5,736,533 | \$1.13696 |
| Best Value Plan ³ | 33,636,640 | 5,045,496 | \$2,147,706 | \$0.42567 |
| Staff Proposed Plan ³ | 33,636,640 | 5,045,496 | \$4,319,324 | \$0.85608 |
| AEPCO ⁴ | 29,507,433 | 4,426,115 | \$1,033,669 | \$0.23354 |
| Duncan Valley | | | | |
| Graham County | | | | |
| Mohave | | | | |
| Trico | | | | |
| Sulphur Springs Valley ² | 15,921,876 | 2,388,281 | \$2,617,715 | \$1.09607 |
| Navopache | 8,207,200 | 1,231,080 | \$500,000 | \$0.40615 |
| Ajo Improvement | 252,612 | 37,892 | \$38,555 | \$1.01750 |

¹ The breakdowns for which budget line items are distributed and non-distributed were developed through discussions with TEP. Costs not related to just distributed or non-distributed activities were allocated 50/50 to each category. Costs for "Reporting" and "Outside Coordination and Support" were split 50/50 between categories. The costs for "Renewable Energy Hardware Development" were split 50/50, except the portion for "operation and maintenance of renewable generation systems cost, etc." which was allocated 100% to non-distributed costs.

² Costs for "Loan Program," "Program Costs," and "CREB Bond Repayment" were allocated 50/50 between distributed and non-distributed categories.

³ The breakdowns for which budget line items are distributed and non-distributed were developed through discussions with UNS Electric. Costs not related to just distributed or non-distributed activities were allocated 50/50 to each category. Costs for "Reporting" and "Outside Coordination and Support" were split 50/50 between categories.

⁴ Distributed costs include "Rebate Program," "PV for Schools," "Habitat for Humanity," "Advertising," and 50% of "Administration."

⁵ Costs of \$1,500,000 for Research, Development, Commercialization, and Integration were allocated 50/50 between distributed and non-distributed categories.

⁶ Costs of \$1,200,000 for Research, Development, Commercialization, and Integration were allocated 50/50 between distributed and non-distributed categories.

Table 3
 Non-Distributed Renewable Energy Standard Costs
 by kWh Sales

| Utility | 2009 REST kWh Requirement | 2009 Non-Distributed REST kWh (Total-Distr.) | 2009 Non-Distributed REST Cost | 2009 Non-Distributed REST Cost per kWh |
|--|------------------------------|---|-----------------------------------|---|
| APS-Compliance Plan ¹ | 583,426,420 | 495,912,457 | \$12,150,000 | \$0.02450 |
| Current Funding ² | 583,426,420 | 513,415,250 | \$12,000,000 | \$0.02337 |
| Alternate Funding ¹ | 583,426,420 | 495,912,457 | \$12,150,000 | \$0.02450 |
| TEP-Full Compliance Plan ³ | 192,688,136 | 163,784,916 | \$7,516,792 | \$0.04589 |
| Best Value Plan ³ | 192,688,136 | 163,784,916 | \$7,338,632 | \$0.04481 |
| Staff Proposed Plan ³ | 192,688,136 | 163,784,916 | \$7,470,817 | \$0.04561 |
| Morenci (with mining load) | 37,001,105 | 31,450,939 | \$1,340,270 | \$0.04261 |
| (without mining load) | 602,697 | 512,292 | \$78,426 | \$0.15309 |
| UNS Electric-Full Compliance Plan ⁵ | 33,636,640 | 28,591,144 | \$723,553 | \$0.02531 |
| Best Value Plan ⁵ | 33,636,640 | 28,591,144 | \$713,553 | \$0.02496 |
| Staff Proposed Plan ⁵ | 33,636,640 | 28,591,144 | \$723,553 | \$0.02531 |
| AEPCO ⁶ | 29,507,433 | 25,081,318 | \$330,389 | \$0.01317 |
| Duncan Valley | | | | |
| Graham County | | | | |
| Mohave | | | | |
| Trico | | | | |
| Sulphur Springs Valley ⁴ | 15,921,876 | 13,533,595 | \$811,293 | \$0.05995 |
| Navopache | 8,207,200 | 6,976,120 | \$2,005,247 | \$0.28744 |
| Ajo Improvement | 252,612 | 214,720 | \$23,698 | \$0.11037 |

¹ Costs of \$1,500,000 for Research, Development, Commercialization, and Integration were allocated 50/50 between distributed and non-distributed categories.

² Costs of \$1,200,000 for Research, Development, Commercialization, and Integration were allocated 50/50 between distributed and non-distributed categories.

³ The breakdowns for which budget line items are distributed and non-distributed were developed through discussions with TEP. Costs not related to just distributed or non-distributed activities were allocated 50/50 to each category. Costs for "Reporting" and "Outside Coordination and Support" were split 50/50 between categories. The costs for "Renewable Energy Hardware Development" were split 50/50, except the portion for "operation and maintenance of renewable generation systems cost, etc." which was allocated 100% to non-distributed costs.

⁴ Costs for "Loan Program," "Program Costs," and "CREB Bond Repayment" were allocated 50/50 between distributed and non-distributed categories.

⁵ The breakdowns for which budget line items are distributed and non-distributed were developed through discussions with UNS Electric. Costs not related to just distributed or non-distributed activities were allocated 50/50 to each category. Costs for "Reporting" and "Outside Coordination and Support" were split 50/50 between categories.

⁶ Non-distributed costs include "Large Scale Purchase Power Contract Program," "Large Scale Generating Program," "Educational Grant Program," "Research and Development," and 50% of "Administration."

A Different Approach to kWh Cost Analysis

APS REST Plan: System Life KWH Cost Analysis by Commission Staff

The attached analysis for the APS 2009 REST Plan shows the system life kWh cost for renewables, either installed in 2009 or contracted for in 2009. The assumption is a 30-year system life for systems installed and a 30-year contract for kWh purchases.

The key in this type of analysis is to ensure that a true “apple to apple” comparison is made between the utility options. For instance, if a utility chooses a kWh contract or offers a Production-Based Incentive (“PBI”) for a renewable project, that utility will pay, EVERY YEAR FOR THE NEXT 30 YEARS, for the kWh produced each year.

Conversely, if a utility chooses to offer an Up-Front Incentive (“UFI”) for the installation of a distributed solar generator, the utility will pay ONCE in 2009 for 30 years of future electricity. There will be no additional future payments for a UFI project, since the solar fuel is FREE.

An “apples to oranges” analysis would attempt to compare these two renewable payment options based on the utility cost in the first year, 2009. That would be a flawed analysis, neglecting to consider the following 29 years (2010-2038) of FREE electricity from the UFI project and also failing to consider the 29 years (2010-2038) of PBI payments that the utility would have to make for a PBI project or 30-year contract purchase.

Details of the Analysis for Table 4

Column B of the spreadsheet comes directly from the APS 2009 REST Plan, Exhibit 1. Column C comes directly from APS 2009 REST Plan, Exhibit 2. Column D shows the cost from 2010-2038 for annual purchases of contracted wholesale renewable kWh or for PBI incentives from 2010-2038. Column E is the sum of costs included in Column C plus Column D. Column F is the 30-year kWh output for each selected resource listed in Column A. Column G is the life-cycle cost per kWh for renewables procured in 2009 which is calculated by taking the total costs from Column E divided by the total kWh in Column F.

**Table 4
APS 2009 REST PLAN: SYSTEM LIFE KWH COST ANALYSIS BY COMMISSION STAFF**

| A | B | C | D | E | F | G |
|---|----------------|---|---|--|---|---|
| | <u>KWH</u> | <u>COST</u> <u>YR 1</u> <u>2009</u> | <u>COST</u> <u>YR 2-30</u> <u>2010-2038</u> | <u>COST</u> <u>30</u> <u>YEARS</u> | <u>30-YEAR</u> <u>OUTPUT</u> <u>KWH</u> | <u>COST</u> <u>PER</u> <u>KWH</u> |
| APS 2009 Retail Electric Sales | 29,531,727,000 | | | | | |
| APS 2009 REST Requirement | 590,634,540 | | | | | |
| Renewable Generation | 502,039,359 | \$ 9,800,000 | \$ 284,200,000 | \$295,600,000 | 15,061,180,770 | \$ 0.020 |
| Renewable Generation Admin | | \$ 1,600,000 | 0 | \$ 1,600,000 | | Renewable Generation |
| Distributed Energy | 88,595,181 | | | | | |
| Existing DE Resources | 26,033,000 | | | | 780,990,000 | |
| Up-Front-Incentive Projects Production-Based Incentives | | \$ 3,300,000 | \$ 95,700,000 | \$ 99,000,000 | | |
| New DE Resources | 62,562,181 | | | | 1,876,865,430 | \$ 0.075 |
| Up-Front-Incentive Projects Production-Based Incentives Contracts | | \$ 50,600,000 | 0 | \$ 50,600,000 | | Distributed Energy |
| DE Administration | | \$ 1,100,000 | \$ 31,900,000 | \$ 33,000,000 | | |
| R & D, Comm. & Integration | | \$ 200,000 | \$ 5,800,000 | \$ 6,000,000 | | |
| TOTALS: | | \$ 10,300,000 | \$ 10,300,000 | \$ 10,300,000 | 17,719,036,200 | \$ 0.028 |
| | | \$ 1,500,000 | \$ 1,500,000 | \$ 1,500,000 | | Average |
| | | \$ 78,400,000 | \$ 497,600,000 | \$ 497,600,000 | | Cost/kwh |

Notes:
 Column B: From APS 2009 REST Plan, Exhibit 1
 Column C: From APS 2009 REST Plan, Exhibit 2
 Column G: Total from Column E divided by the Total from Column F