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BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF ARIZONA PUBLIC SERVICE COMPANY REQUEST FOR APPROVAL OF UPDATED GREEN POWER RATE SCHEDULE GPS-1, GPS-2, AND GPS-3.	DOCKET NO. E-01345A-10-0394
IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTATION FOR RESET OF RENEWABLE ENERGY ADJUSTOR.	DOCKET NO. E-01345A-12-0290
IN THE MATTER OF THE APPLICATION OF TUCSON ELECTRIC POWER COMPANY FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTATION PLAN AND DISTRIBUTED ENERGY ADMINISTRATIVE PLAN AND REQUEST FOR RESET OF ITS RENEWABLE ENERGY ADJUSTOR.	DOCKET NO. E-01933A-12-0296
IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC. FOR APPROVAL OF ITS 2013 RENEWABLE ENERGY STANDARD IMPLEMENTATION PLAN AND DISTRIBUTED ENERGY ADMINISTRATIVE PLAN AND REQUEST FOR RESET OF ITS RENEWABLE ENERGY ADJUSTOR.	DOCKET NO. E-04204A-12-0297 **STAFF'S NOTICE OF FILING DIRECT TESTIMONY**

Staff of the Arizona Corporation Commission ("Staff") hereby files the Direct Testimony of Robert G. Gray in the above docket.

RESPECTFULLY SUBMITTED this 24th day of April, 2013.

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Arizona Corporation Commission
DOCKETED
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JM

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DIRECT

TESTIMONY

OF

ROBERT G. GRAY

EXECUTIVE CONSULTANT III

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

APRIL 24, 2013

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EXECUTIVE SUMMARY
ARIZONA PUBLIC SERBICE COMPANY, ET AL
DOCKET NOS. E-01345A-10-0394, ET AL

My testimony in this proceeding provides Staff's perspectives and recommendations regarding how the Commission should treat distributed energy for purposes of determining whether jurisdictional utilities are in compliance with the REST rules. Staff previously recommended adoption of a track and record methodology. Staff is now recommending a modification of its previous track and record proposal, which it is now calling Track and Monitor.

INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Robert G. Gray. I am an Executive Consultant III employed by the Arizona Corporation Commission ("ACC" or "Commission") in the Utilities Division ("Staff"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Briefly describe your responsibilities as an Executive Consultant III.

A. In my capacity as an Executive Consultant III, I conduct analysis and provide recommendations to the Commission on a variety of electricity, natural gas, and water/wastewater matters. A copy of my resume is attached as Exhibit RGG-1.

Q. What is the scope of this testimony?

A. My testimony provides Staff's perspectives and recommendations regarding how the Commission should treat distributed energy for purposes of determining whether jurisdictional utilities are in compliance with the Renewable Energy Standard and Tariff ("REST") rules.

Q. Have you reviewed the testimony of Arizona Public Service Company Witness Gregory L. Bernosky and Tucson Electric Power Company/UNS Electric Inc. Witness Carmine Tilghman?

A. Yes. I have reviewed their testimony and will discuss their recommendations as part of my testimony.

BACKGROUND

Q. Please discuss the background of this proceeding.

A. The immediate reason for this testimony is that in the Commission's orders approving the Arizona Public Service Company ("APS"), Tucson Electric Power Company ("TEP"), and UNS Electric, Inc. ("UNS") 2013 REST plans, the Commission ordered that a hearing be held and a Recommended Opinion and Order ("ROO") be prepared for Commission consideration on the track and record proposal and alternatives. The Commission further ordered that the ROO in this proceeding should evaluate whether adoption of track and record or alternatives would require modifications to the REST rules. On March 29, 2013, APS and TEP/UNS filed testimony providing their perspectives and proposals for how they should achieve compliance with the REST rules in future years if/when at least some incentive levels reach zero.

More broadly speaking, there has been a gradual realization in recent years that as incentives for distributed energy ("DE") continued to decline, a time could come in the near term future when utilities would no longer need to offer direct incentives for DE installations to take place within their service territories. Traditionally when utilities offered direct incentives for DE installations, a transaction took place where the utility provided the incentive to a customer and the utility received the renewable energy credit ("REC") in return. Utilities then used the RECs to achieve compliance under the REST rules which require the utility to meet a growing percentage of its electricity needs via renewable energy resources, culminating in a 15 percent standard in 2025. However, this transaction breaks down once a utility no longer offers a direct incentive or offers a direct incentive sufficiently small that at least some customers would decline to request the incentive from the utility. In these situations, the customer no longer would be providing the RECs to the utility in return for the incentive payment. Thus, the REST rules, as currently formulated, do not provide a clear pathway for utilities to demonstrate compliance with the REST standard in an environment where DE incentives are no longer offered or are small enough that some customers do not take them. The REST rules are premised on measuring the percent of a utility's load it is meeting with renewable resources. To the extent renewable resources are installed in their service territory and are not accounted for in some manner, the REST compliance reports will fail to reflect reality, ie., a higher percent of electric load will be served with renewable energy than is reported.

APS, TEP and UNS recognized this issue when they filed their proposed 2013 REST plans with the Commission on June 29, 2012 (APS) and July 2, 2012 (TEP and UNS). APS' proposed 2013 REST plan specifically proposed adoption of a track and record method for DE compliance, whereby APS would meter all DE production that is interconnected with APS' system for REST compliance, without acquiring RECs from those customers. TEP's and UNS' proposed 2013 REST plans both requested guidance from the Commission on how to demonstrate REST compliance in a post-incentive time and put forth four options for consideration:

> "1. Change or waive the existing Resource Portfolio Standard ("RPS") to eliminate either the DG requirement, or the requirement to retire RECs associated with the customer-sited distributed generation system and allow the utility to report metered production data in order to show the percentage of sales associated with renewable energy.
>
> 2. Allow utilities to modify their existing net-metering tariffs to require customers to surrender all credits and environmental attributes in exchange for net-metering.
>
> 3. Allow utilities to meet the RPS DG requirement by showing a percentage of their sales through metered data without the requirement of retiring REC's (and without altering the existing rules).
>
> 4. In the absence of existing rule changes, allow the utilities to request waivers for meeting the DG requirement through the use of REC retirement and allow the utility to show compliance in an alternative manner."

TEP's proposed 2013 REST plan notes that this issue was already coming to fruition in TEP's service territory, as TEP already had over 4 megawatts ("MW") of DE installations as of July 2012 that had not taken incentives from TEP.

On October 18, 2012, Staff filed its Staff reports on the proposed APS, TEP, and UNS 2013 REST plans. In all three Staff reports, Staff recommended adoption of the track and record method of determining DE compliance with the REST rules. A number of entities filed comments in the APS and TEP proceedings, proposing various possible alternatives to the track and record proposal. These events led to the Commission ordering this current proceeding.

Q. Please discuss some of the proposals made by APS and TEP/UNS in their March 29, 2013 testimony?

A. One solution proposed by APS and TEP would be to eliminate the DE set-aside from the REST rules, with a temporary waiver of the DE set-aside while the Commission would amend the REST rules to remove the requirement. They further propose that the 15 percent REST requirement remain intact, even with elimination of the DE set-aside.

Q. Please provide Staff's perspective on this proposal.

A. Staff does not support this proposal for several reasons. First, while parties may debate the merits of adopting a DE set-aside in the first instance, the proposal to remove it would clearly be a substantive change to the Commission's policy decision to codify the DE set-aside in the REST rules. Second, removal of the DE set-aside would not address Staff's desire to have REST compliance reports reflect reality concerning how much electric load is being served by renewable energy. Even if the DE set-aside were removed, some amount of DE will continue to be installed, giving rise to the same issue that we are trying to resolve in this proceeding: how should the Commission treat that distributed energy for purposes of assessing compliance with the REST rules?

Third, this proposal would result in a *de facto* increase of the REST rules' 15 percent renewable energy requirement. The amount of the increase would depend on the amount of additional DE that is installed without a utility incentive. None of this additional energy could be used towards meeting the 15 percent requirement.

Finally, removing the DE set-aside would not reduce the number of carve-outs from the REST rules, it would simply replace the existing 4.5 percent DE carve-out, with something approaching a 15 percent utility scale carve out. Currently, of the 15 percent REST requirement in 2025, 4.5 percent must be met by DE. Under the utilities' proposal, the 4.5 percent reservation for DE is eliminated, and thus the utility scale component would have to make up the difference, requiring something close to the full 15 percent (taking into account some amount of residual DE RECs the utilities have already acquired or will acquire). Given the current much higher direct cost recovered through the REST surcharge of utility scale generation in comparison to the low level of DE incentives that has been offered recently, such an expansion of the utility scale component could significantly increase utility REST budgets in future years and therefore the costs recovered from ratepayers through the REST surcharge.

Q. APS indicates it considered several other options and TEP/UNS identifies several short term alternatives. What were these alternatives and options?

A. They included tying RECs to all utility interconnections, tying RECs to net metering, eliminating the DE requirement while reducing the overall REST requirement to 10.5 percent, and a variation of track and record where the REST requirement would be reduced to reflect production from energy systems where no REC transfer to the utility takes place.

Q. What were the primary goals considered by Staff in formulating its position in this proceeding?

A. While there are many considerations in evaluating how compliance under the REST rules should be achieved in a setting where there is little if any incentive money offered for DE installations, the following goals were the most important considerations to Staff:

1. Provide a clear and easily documented way for utilities to achieve compliance under the REST rules;
2. Recognize reality regarding how much electric load is actually being met with renewable energy;
3. Minimize the cost to ratepayers;
4. Maximize value to the extent possible for those who undertake DE installations and Arizona as a whole; and
5. Be minimally invasive to the REST rules.

Q. Given developments to date, does Staff continue to support the track and record type method that was contained in the Staff Reports on the utilities' 2013 REST plans filed by Staff in October 2012?

A. Yes, Staff continues to believe that a form of track and record is the best solution for the Commission to adopt in this proceeding. However, taking into consideration input from interested entities and the utilities, Staff now supports a modified form of track and record, rather than the form of track and record it supported in the October 2012 Staff Reports.

Q. Please describe the modified form of track and record Staff now supports.

A. The modified form of track and record Staff now supports, what Staff will refer to as "Track and Monitor", would be based on an alternative contained in TEP/UNS' March 29, 2013 testimony. Under this alternative, where Track and Monitor would be used, the REST requirement would be reduced for each utility, on a kWh per kWh basis, for all DE that is produced in their service territory where no REC transfer to the utility takes place.

Q. How does Track and Monitor meet Staff's goal of providing a clear and easily documented way for utilities to achieve compliance under the rest rules?

A. The utilities will have, or will shortly have, production meters on all interconnected DE facilities in their service territory and will know which DE facilities have involved a REC transfer to the utility or not. Thus the utilities will know exactly how much production has taken place from all DE facilities. With this knowledge they will know whether the DE component in the REST rules will be reduced enough by DE facilities that did not transfer their RECs to the utility in a given year so that their compliance requirements under the REST rules are met, in conjunction with their utility scale production and any DE production for which they still receive the RECs. Use of actual production information is a clear and straightforward method to determine what is happening for each utility each year under the REST rules.

Q. How does Track and Monitor meet Staff's goal of recognizing reality regarding how much electric load is being met with renewable energy?

A. Track and Monitor fully captures DE generation activity in a given utility's service territory, providing an accurate picture of how much renewable energy production is taking place on an on-going basis. The Arizona renewable energy marketplace will have accurate information on what is happening both within utility renewable energy programs and with projects that are not part of a utility's REST compliance efforts. This was a strength of the track and record proposal made by Staff in the October 2012 Staff Reports, and it continues to be a strength of this current proposal. It is very straightforward to track the actual metered production of renewable facilities.

Q. How does Track and Monitor meet Staff's goal of minimizing the cost to ratepayers?

A. The Track and Monitor proposal should not lead to any additional costs to ratepayers in comparison to the current formulation of the REST requirement. It will actually lower REST surcharge costs if DE deployments that do not take an incentive go beyond the 4.5 percent DE REST compliance floor and lower the 10.5 percent that must be met with utility scale generation.

Q. How does Track and Monitor meet Staff's goal of maximizing value to the extent possible for those who undertake DE installations and Arizona as a whole?

A. Under Track and Monitor, those who undertake DE installations without taking a utility incentive would retain the rights to their RECs, unlike other options such as requiring an exchange of RECs in order to interconnect with a utility or take net metering service from a utility. A variety of renewable energy interests have expressed a desire to have owners of DE systems maintain ownership of the RECs their systems produce.

Under Track and Monitor, owners of DE systems that do not take a utility incentive will retain ownership of their RECs. They can use their RECs to meet their own renewable energy goals or potentially even sell their RECs. Such sales would inevitably enhance the economic equation for installing DE in Arizona and therefore would likely spur further DE installations in Arizona. Such additional installations would not increase the REST surcharge and could provide further opportunities for economic activity in Arizona.

A further benefit of Track and Monitor is that it resolves the issue of cases such as the Veterans Administration ("VA") in Tucson, where there were potentially competing claims for the RECs produced by renewable energy facilities that did not take an incentive in TEP's service area, such as the VA facilities in Tucson. As noted in the VA's letter docketed in TEP's 2013 REST plan docket on November 26, 2012, the VA expressed a concern that the "vanilla" track and record proposal would allow TEP to claim RECs from VA installations in the TEP service territory for which the VA took no incentives[1]. The VA believes that under such a scenario it could not use the RECs from such installations to meet federal renewable energy goals and requirements. Use of Track and Monitor would alleviate this issue for the VA and any other similar situations which could develop within utility service territories in Arizona.

Q. How does Track and Monitor meet Staff's goal of being minimally invasive to the REST rules?

A. Track and Monitor would only adjust the REST compliance requirements for production from facilities that do not take an incentive and do not transfer their RECs to the utility. This is less invasive than, for example, elimination of the DE portion of the rules. The current carve-out for DE would be maintained under Track and Monitor. No new carve-outs are created under the Track and Monitor proposal.

[1] See also November 26, 2012 letter from Department of Veterans Affairs filed I APS' RES docket claiming Track and Record would interfere with VA's ability to sell or claim solar generation from VA's facilities in Phoenix, Prescott and other portions of APS's service territory in Arizona. The VA stated that with Track and Record APS would have the ability to count any of VA's general RECs towards APS' own renewable energy requirements, VS cannot retain credit for RECs generated by VA facilities if they are counted towards another entities' RES requirements.

Q. How does the Track and Monitor Proposal differ from APS's modified Track and Record proposal contained in their Direct Testimony?

A. Under APS's modified track and record proposal, APS and other affected utilities would no longer be required to obtain RECs from DE sources as contemplated in A.A.C. R-14-2-1805. Customers installing DE would keep their RECs. But APS would track the energy produced by DE installations through the continued deployment of DE production meters and annually report the amount of that energy to the Commission for informational purposes, rather than compliance purposes. The requirement that affected utilities acquire a certain amount of RECs from DE would be eliminated. As discussed earlier, however, Staff does not support elimination of the DE set-aside.

Q. How does Staff recommend the Commission implement the Track and Monitor proposal within the context of the REST rules and the utilities' annual REST plan filings?

A. Staff believes that initially the Commission should grant a waiver to the utilities to implement Track and Monitor. Then, if Track and Monitor seems to be working well, the Commission could consider amending the REST rules to reflect Track and Monitor on a permanent basis. Staff anticipates that if Track and Monitor were approved by the Commission in this proceeding and implemented with the utilities' 2014 REST plans, that the utilities could report back to the Commission in their July 1, 2014 filings of their proposed 2015 REST plans as to how Track and Monitor is working and if they believe any adjustments need to be made.

Q. What specifically would this waiver do to the existing REST rules?

A. It would allow the utilities to adjust applicable REST requirements downward, on a kWh per kWh basis, in a given compliance year to reflect production from facilities within their service territory that did not receive an incentive and did not transfer RECs to the utility. Further, as I discuss below, utilities would not be penalized for not achieving the overall REST requirement in a given year if they had been meeting it in previous years.

Q. Would the Track and Monitor proposal avoid the problem noted by some stakeholders that when incentives are at a low level, no recognition is given to the fact that some customers are taking an incentive and transferring RECs to the utility and some customers are not?

A. Yes. All customers' production would be metered and they would either fall into the category where the utility receives the RECs or they would fall into the category of production facilities where no incentive is taken and no RECs are transferred to the utility. But production from both categories would be accounted for, either toward meeting the utility's REST compliance requirement or by reducing the utility's REST compliance requirement.

Q. Should the Commission adopt Track and Monitor even if utility incentives in certain DE segments have not reached zero?

A. Yes. From a practical standpoint, most direct incentives are at zero or are quite low at this time and it is unclear exactly when they will reach zero, but it is likely to happen in the near future in various utility service territories. So adopting Track and Monitor at this time will avoid trying to synchronize adoption with the elimination of direct incentives at some point, possibly mid-year, in the future. Further, various types of direct incentives may reach zero at different times for a given utility. There is no downside to adopting Track and Monitor sooner, rather than later.

And finally, utilities have noted that installations are taking place without taking an incentive even when incentives still exist. For example, TEP's 2013 REST plan filing noted that TEP had seen more than 4 MW of installations that had not taken an incentive as of July 2012, with more expected to occur as incentives ramped down in 2012 and into 2013. Track and Monitor would provide a mechanism for accounting for those installations in a marketplace where some customers are taking direct incentives and some are not. Currently, those installations not taking a direct incentive fall between the cracks, so to speak, of the current formulation of the REST rules. Yet, such installations certainly do impact the extent to which the required percent of load within a given service territory is being met with renewable energy resources and thus should somehow be reflected in utility REST reporting, whether toward meeting the REST requirement under Track and Monitor or toward reducing it.

Q. Does anything in Staff's proposal impact the utility scale segment of the REST requirement?

A. No. Utilities would continue to meet their utility scale generation requirements under the REST rules with the kWh from utility-owned renewable generation or purchased power agreements with third party utility scale renewable generation, just as before.

Q. Under Staff's Track and Monitor proposal, could a utility reduce its REST requirement for the metered kWh production from a DE facility that is not taking an incentive and then also acquire the RECs for those same kWhs from that production facility to help meet its remaining REST requirements?

A. No. Staff believes that if a utility recognizes a kWh produced by a DE facility to reduce the REST requirement, then it should not be allowed to acquire the RECs from that facility to meet its remaining REST requirement. This would violate the spirit of the

REST rules' intention to have 15 percent of retail electricity sales met through actual renewable energy.

Q. How does Staff anticipate the results of this proceeding be incorporated into future REST filings by the utilities?

A. It is unlikely that a decision will be available prior to the utilities filing their proposed 2014 REST plans on July 1, 2013, given that the hearing in this proceeding will begin in early June 2013. However, it seems much more likely that a decision in this proceeding may be issued in the late summer/ fall 2013 timeframe. In this case, Staff believes there could be time for utilities to file revisions to their proposed 2014 REST plans to reflect the results of this proceeding. The Commission would then be able to consider these proposals as part of its deliberations over utilities' 2014 REST plans.

Q. Under Track and Monitor, should a utility be penalized for falling short of the DE portion of the REST requirement in a given year if it had been meeting the requirement in past years?

A. No. However, if a utility were falling significantly short of the DE portion of the REST requirement in such a year, the Company would be expected to come before the Commission in a timely fashion, such as in its next filing for approval of an annual REST plan, to address the shortfall in some fashion, such as potentially reinstating a direct incentive level to spur the market to a point where the utility would be back in compliance in the following year.

Q. If the DE market where no transfer of RECs to the utility take place slows down to a point where a utility still has an outstanding portion of its DE requirement to comply with, how would such a situation be addressed under the Staff proposal?

A. The utility, as is currently the case, would have the ability to come before the Commission as part of its annual REST plan filing, or at another time of the utility's choosing, to request a reinstatement of a direct incentive for given segment(s) of the DE market to spur further DE installations to enable the utility to achieve compliance. Exhibit Two shows three examples of the calculations that are made under different Track and Monitor Scenarios.

Q. Does Staff's Track and Monitor proposal maintain the spirit of the REST rules, which is to see 15 percent deployment of renewable resources within each utility service territory in 2025?

A. Yes. While the formal compliance requirement would be reduced under Track and Monitor to some level below 15 percent, the actual level of renewable energy in a given utility's service territory in total, would tally to at least 15 percent. Therefore, Track and Monitor would not result in any reduction in the amount of renewable energy being deployed in a given utility's service territory through 2025, when utilities are supposed to meet the 15 percent REST requirement.

Q. Does this conclude your direct testimony?

A. Yes, it does.

RESUME

ROBERT G. GRAY

Education

B.A. Geography, University of Minnesota-Duluth (1988)
M.A. Geography, Arizona State University (1990) Thesis: *A Model for Optimizing the Federal Express Overnight Delivery Aircraft Network.*

Employment History

Arizona Corporation Commission, Utilities Division, Phoenix, Arizona: Executive Consultant III (November 2007 – present), Public Utility Analyst V (October 2001 – November 2007), Senior Economist (August 1997 – October 2001), Economist II (June 1991 - July 1997), Economist I (June 1990 - June 1991). Conduct economic and policy analyses on a variety of natural gas issues in Arizona, including gas procurement, rate design, interstate pipeline issues, revenue decoupling, energy conservation, low income issues, natural gas research and development funding, customer services issues, special contracts, various tariff matters, and other natural gas issues. Conduct economic and policy analyses on a variety of electricity issues in Arizona, power plant and transmission line siting cases, energy efficiency, renewable energy standards, rate design, time-of-use service, and low income issues. Prepare recommendations and present written and oral testimony before the Commission and organize workshops and other proceedings on various utility industry issues. Represent the ACC in natural gas proceedings at the Federal Energy Regulatory Commission, at the North American Energy Standards Board, and on the National Association of Regulatory Utility Commissioners' Staff Subcommittee on Gas, including serving as a past Vice-Chair and Chair of the NARUC Staff Subcommittee on Gas.

Testimony

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Semstream Arizona Propane Acquisition of Energy West (Docket G-02696A-06-0515), Arizona Corporation Commission, 2006.

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Coolidge Power Corporation, Coolidge Power Project Application before the Arizona Power Plant and Line Siting Committee, (L-00000HH-08-0422-00141), 2008.

UNS Gas Inc., Rate Proceeding (Docket No. G-04204A-08-0571), Arizona Corporation Commission, 2009.

El Paso Natural Gas Company, Rate Proceeding (Docket No. RP08-426), Federal Energy Regulatory Commission, 2009.

Arizona Water/Global Water CC&N Extension/Acquisition Proceeding (Docket Nos. W-01445A-06-0199, etc.), Arizona Corporation Commission, 2009.

Graham County Utilities Company Rate Proceeding (Docket No. G-02527A-09-0088), Arizona Corporation Commission, 2009.

Southwest Gas Corporation Rate Proceeding (Docket No. G-01551A-10-0458), Arizona Corporation Commission, 2010.

UNS Gas Inc., Rate Proceeding (Docket No. G-04204A-11-0158), Arizona Corporation Commission, 2011.

Semstream Arizona Propane, LLC Rate Proceeding, (Docket No. G-20471A-11-0150), Arizona Corporation Commission, 2011.

El Paso Natural Gas Company, Rate Proceeding, (Docket No. RP10-1398), Federal Energy Regulatory Commission, 2011.

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Publications

(with David Berry, Kim Clark, Lewis Gale, Barbara Keene, and Harry Sauthoff) Staff Report on Resource Planning. (Docket No. U-0000-90-088) Arizona Corporation Commission, 1990.

(with Prem Bahl) "Transmission Access Issues: Present and Future," October, 1991.

(with David Berry) Substitution of Photovoltaics for Line Extensions: Creating Consumer Choices. Arizona Corporation Commission, 1992.

(with Barbara Keene and Kim Clark) Report of the Task Force on the Feasibility of Implementing Sliding Scale Hookup Fees, December, 1992.

(with Mike Kuby) "The Hub and Network Design Problem With Stopovers and Feeders: The Case of Federal Express," Transportation Research A., Vol. 27A, 1993, pp. 1-12.

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(with Ray Williamson, Robert Hammond, Frank Mancini, and James Arwood) The Solar Electric Option (Instead of Power Line Extension). A joint publication of the Arizona Corporation Commission and the Arizona Department of Commerce Energy Office, August, 1993.

(with David Berry, Kim Clark, Barbara Keene, Jesse Tsao, Ray Williamson, Randall Sable, Roni Washington, Wilfred Shand, and Prem Bahl) Staff Report on Resource Planning. (Docket No. U-0000-93-052) Arizona Corporation Commission, 1993.

Staff Report On Rural Local Calling Areas. (Docket No. E-1051-93-183) Arizona Corporation Commission, March, 1994.

(with David Berry, Kim Clark, Barbara Keene, Glenn Shippee, Julia Tsao, and Ray Williamson) Staff Report on Resource Planning. (Docket No. U-000-95-506) Arizona Corporation Commission, 1996.

(with Barbara Keene) "Customer Selection Issues," NRRI Quarterly Bulletin, Vol. 19, No. 1, Spring 1998, National Regulatory Research Institute.

Staff Report on Purchased Gas Adjustor Mechanisms, (Docket No. G-00000C-98-0568) Arizona Corporation Commission, October 19, 1998.

Staff Report on the Rolling Average PGA Mechanism, (Docket No. G-00000C-98-0568),Arizona Corporation Commission, September 6, 2000.

Staff Report on the Use of a Circuit-Breaker in Adjustor Mechanisms, Arizona Corporation Commission, September 3, 2003.

Staff Report on Southwest Gas Filing for Pre-Approval of Cost Recovery for Participation in the Kinder Morgan Silver Canyon Pipeline Project, (Docket No. G-01551A-04-0192), Arizona Corporation Commission, June 2, 2004.

Staff Report on Arizona Public Service Company Filing for Pre-Approval of Cost Recovery for Participation in the Kinder Morgan Silver Canyon Pipeline Project, (Docket No. E-01345A-04-0273), Arizona Corporation Commission, August 16, 2004.

Staff Report on Arizona Public Service Company Filing for Pre-Approval of Cost Recovery for Participation in the Transwestern Pipeline Phoenix Project, (Docket No. E-01345A-05-0895), Arizona Corporation Commission, March 2, 2006.

Staff Report on Southwest Gas Filing for Pre-Approval of Cost Recovery for Participation in the Transwestern Pipeline Phoenix Project, (Docket No. G-01551A-06-0107), Arizona Corporation Commission, May 16, 2006.

Staff Report on UNS Gas Filing for Pre-Approval of Cost Recovery for Participation in the Transwestern Pipeline Phoenix Project, (Docket No. G-04204A-06-0627), Arizona Corporation Commission, January 30, 2007.

Staff Review of UNS Electric 2008 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-07-0593), Arizona Corporation Commission, March 25, 2008.

Staff Report on Semstream Arizona Propane, Payson Division Bankruptcy, Reorganization, and other issues, Arizona Corporation Commission, June 6, 2008.

Staff Review of UNS Electric 2009 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-07-0593), Arizona Corporation Commission, November 26, 2008.

Staff Review of Tucson Electric Power 2009 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-01933A-07-0594), Arizona Corporation Commission, November 26, 2008.

Staff Report for Arizona Water Company and Global Water Resources LLC's Consolidated Docket Addressing Numerous Requests for Extensions of Certificates of Convenience and Necessity for Water and Wastewater Service as Well as the Transfer of Assets, (Docket No. W01445A-06-0199, etc.), Arizona Corporation Commission, May 10, 2009.

Staff Review of UNS Electric 2010 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-09-0347), Arizona Corporation Commission, January 5, 2010.

Staff Review of Tucson Electric Power 2010 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-01933A-09-0340), Arizona Corporation Commission, January 5, 2010.

Staff Review of UNS Electric 2011 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-10-0265), Arizona Corporation Commission, November 8, 2010.

Staff Review of Tucson Electric Power 2011 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-01933A-10-0266), Arizona Corporation Commission, November 9, 2010.

Staff Review of UNS Electric 2012 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-11-0267), Arizona Corporation Commission, October 25, 2011.

Staff Review of Tucson Electric Power 2012 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-01933A-11-0269), Arizona Corporation Commission, October 25, 2011.

Staff Review of UNS Electric 2013 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-04204A-12-0297), Arizona Corporation Commission, October 18, 2012.

Staff Review of Tucson Electric Power 2013 Renewable Energy Standard Tariff and Implementation Plan, (Docket No. E-01933A-12-0296), Arizona Corporation Commission, October 18, 2012.

Additional Training

1990	Seminars on Regulatory Economics
1993	PURTI course on Public Utilities and the Environment
1996	Center for Public Utilities Workshop on Gas Unbundling and Retail Competition
1997	NARUC 6th Annual Natural Gas Conference
1998	Local Distribution Company Restructuring and Retail Access and Competition Conference
1998	NARUC 7th Annual Natural Gas Conference
1999 – 2007, 2010, 2012	NARUC Summer Committee Meetings
2001	Center for Public Utilities Workshop on Risk Management in Gas Purchasing
2003-2008	NARUC Winter Committee Meetings
2004-2007	NARUC Annual Convention

Memberships

NARUC – Staff Subcommittee on Gas – member, 1998 - present
NARUC – Staff Subcommittee on Gas – Vice-Chair - 2002 - 2004
NARUC – Staff Subcommittee on Gas – Chair - 2005 - 2007
Michigan State Institute for Public Utilities – NARUC Advisory Committee – 2005-2007
NARUC – North American Energy Standards Board Advisory Council – 2006 - present
NARUC – DOE LNG Partnership – 2003 - present

Exhibit RGG-2: Hypothetical Track and Monitor REST Compliance Calculation Scenarios

In 2014, the REST Rules require that 4.5 percent of utility load be met by renewable resources, with 30 percent of that being met through distributed renewable energy resources.

Scenario One

Line 1	Total Utility Sales in 2014	2,222,220 MWH	
Line 2	Initial 2014 Total REST Requirement	100,000 MWH	Line 1 *4.5%
Line 3	DE Component of REST Requirement (30%)	30,000 MWH	Line 2*30%
Line 4	Metered Production from DE Facilities that Didn't Take an Incentive and RECs were not Acc	35,000 MWH	
Line 5	Revised 2014 Total REST Requirement	65,000 MWH	Line 2-Line 4
Line 6	DE Production Where an Incentive Was Given and RECs were Acquired	5,000 MWH	
Line 7	Utility Scale Generation Required to Meet Revised 2014 Total REST Requirement	60,000 MWH	Line 5-Line 6
Line 8	Shortfall	MWH	

Discussion: The utility REST requirement for 2014 was reduced by 35,000 MWH due to production from facilities that did not take an incentive. The utility met the revised 65,000 MWH 2014 REST Requirement through 5,000 MWH of DE Production from situations where customers had taken an incentive and 60,000 MWH of utility scale generation. The end result is that the utility is in compliance with REST requirements.

Scenario Two

Line 1	Total Utility Sales in 2014	2,222,220 MWH	
Line 2	Initial 2014 Total REST Requirement	100,000 MWH	Line 1 *4.5%
Line 3	DE Component of REST Requirement (30%)	30,000 MWH	Line 2*30%
Line 4	Metered Production from DE Facilities that Didn't Take an Incentive and RECs were not Acc	25,000 MWH	
Line 5	Revised 2014 Total REST Requirement	75,000 MWH	Line 2-Line 4
Line 6	DE Production Where an Incentive Was Given and RECs were Acquired	5,000 MWH	
Line 7	Utility Scale Generation Required to Meet Revised 2014 Total REST Requirement	70,000 MWH	Line 5-Line 6
Line 8	Shortfall		

Discussion: The utility REST requirement for 2014 was reduced by 25,000 MWH due to production from facilities that did not take an incentive. The utility met the revised 75,000 MWH 2014 REST Requirement through 5,000 MWH of DE Production from situations where customers had taken an incentive and 70,000 MWH of utility scale generation. The end result is that the utility is in compliance with REST requirements.

Scenario Three

Line 1	Total Utility Sales in 2014	2,222,220 MWH	
Line 2	Initial 2014 Total REST Requirement	100,000 MWH	Line 1 *4.5%
Line 3	DE Component of REST Requirement (30%)	30,000 MWH	Line 2*30%
Line 4	Metered Production from DE Facilities that Didn't Take an Incentive and RECs were not Acc	15,000 MWH	
Line 5	Revised 2014 Total REST Requirement	85,000 MWH	Line 2-Line 4
Line 6	DE Production Where an Incentive Was Given and RECs were Acquired	5,000 MWH	
Line 7	Utility Scale Generation Required to Meet Revised 2014 Total REST Requirement	70,000 MWH	Line 5-Line 6
Line 8	Shortfall		

Discussion: The utility REST requirement for 2014 was reduced by 15,000 MWH due to production from facilities that did not take an incentive. The utility met most of the revised 75,000 MWH 2014 REST Requirement through 5,000 MWH of DE Production from situations where customers had taken an incentive and 70,000 MWH of utility scale generation, leaving a shortfall of 10,000 MWH. The end result is that the utility is short of the REST requirements and would need to address that shortfall in or before its next REST plan filing.

Note: Line 7 is limited to 70 percent of the Initial 2014 Total REST requirement in recognition that under the REST rules, utility-scale generation cannot meet more than 70 percent of the total REST requirement.