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FROM: Ernest G. Johnson
Director
Utilities Division

DATE: March 15, 2004

RE: STAFF REPORT ON DSM WORKSHOP PROGRESS FOR THE GENERIC PROCEEDING CONCERNING ELECTRIC RESTRUCTURING ISSUES, ET AL (DOCKET NOS. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069

Attached is the Staff Report on the progress of the DSM Workshops required by Decision No. 65743 ("Track B").

EGJ:BEK:rdp

Originator: Barbara Keene

Attachment: Original and 14 Copies

Arizona Corporation Commission
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Service List for: Generic Proceeding Concerning Electric Restructuring Issues, et al
Docket No. E-00000A-02-0051, et al

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STAFF REPORT
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION

GENERIC PROCEEDING CONCERNING ELECTRIC RESTRUCTURING ISSUES, ET AL

DOCKET NO. E-00000A-02-0051, ET AL

DSM WORKSHOP PROGRESS REPORT

MARCH 15, 2004

STAFF ACKNOWLEDGMENT

The Staff Report on progress of the DSM Workshops for the Generic Proceeding Concerning Electric Restructuring Issues, Docket Nos. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069 and E-01933A-98-0471, was the responsibility of the Staff member listed below.

Barbara Keene

Barbara Keene
Public Utilities Analyst

EXECUTIVE SUMMARY
DSM WORKSHOPS PROGRESS REPORT
DOCKET NOS. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069 AND E-01933A-98-0471

The Commission issued Decision No. 65743 (Track B) on March 14, 2003. In that Decision, the Commission ordered Staff to facilitate a workshop process to explore the development of a DSM policy. The exploration was to include an examination of the possible costs and benefits of the policy. Staff was to file a report within 12 months of Decision No. 65743 informing the Commission of the progress achieved in the workshops, including a recommendation on whether hearings should be held.

DSM Workshops were held from October 2003 through February 2004. Information was obtained from utilities concerning the demand-side management (DSM) programs they are currently pursuing and historical costs and savings. Workshop participants developed primary criteria for evaluating DSM opportunities and presented proposals for DSM programs. Participants agreed that there are several topics remaining to be addressed in future Workshops.

Staff recommends that the DSM Workshops continue to occur on a monthly basis to address outstanding issues. Workshop participants believe that they can develop a proposed DSM policy statement within six months of this report. Staff intends to facilitate the development of the policy statement within six months.

Staff recommends filing a final report and possibly recommendations after the Workshops have concluded. Staff anticipates that the second report would be filed by the end of calendar year 2004. Staff further recommends that a recommendation on whether to hold a hearing be deferred until the final Staff report.

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Introduction

The Commission issued Decision No. 65743 ("Track B") on March 14, 2003. In that Decision, the Commission ordered Staff to facilitate a workshop process to explore the development of a DSM policy. The exploration was to include an examination of the possible costs and benefits of the policy. Staff was to file a report within 12 months of Decision No. 65743 informing the Commission of the progress achieved in the workshops, including a recommendation on whether hearings should be held.

The first DSM Workshop was held on October 30, 2003. Subsequent Workshops were held on December 5, 2003; January 15, 2004; and February 13, 2004. Participants included representatives from utilities, state agencies, cities, counties, energy efficiency and environmental advocacy groups, utility investors, energy service companies, electrical districts, product distributors, and large industrial consumers. A list of participants is in Schedule 1.

What is DSM?

Demand-side Management ("DSM") is the planning, implementation, and evaluation of programs to shift peak load to off-peak hours, to reduce peak demand ("kW"), and to reduce energy consumption "(kWh") in a cost-effective manner. DSM programs are also known as conservation or energy efficiency programs. The DSM Workshops have not addressed programs known as demand response programs.

SWEEP Proposal

In November 2002, the Southwest Energy Efficiency Project ("SWEEP") released a report, "The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest." SWEEP reports that electricity demand (kWh) in Arizona is projected to grow 3 percent per year on average between 2003 and 2020 if current policies and trends are maintained. At the first DSM Workshop, SWEEP recommended using energy efficiency measures to reduce electricity demand growth in Arizona to less than 2 percent per year. SWEEP estimates that required utility funding would be about $0.002 per kWh.

Current Utility DSM Activities

Each of the Commission-regulated electric and natural gas utilities with current DSM programs made presentations at the first DSM Workshop. They presented information on the DSM programs they are currently pursuing.

Arizona Public Service

Arizona Public Service ("APS") had rebate/incentive DSM programs before 1996. The company's strategy evolved into a market transformation ("MT") approach in 1996. The foundation of APS' MT strategy consists of research, trade alliances, contractor/builder training, technical/sales support, consumer education, cost-effective DSM, focus on most significant end

uses, and fuel neutrality. Research has shown that the biggest efficiency improvements are to be found in proper installation. Training and education are key.

APS currently has market transformation programs for existing residential, new residential construction, and commercial/industrial market segments. Activities for the existing residential segment are trade ally training, consumer education, technical assistance, and the Qualified Contractor Program. Trade ally training consists of HVAC (heating, ventilating, and air conditioning) education subsidies, building science seminars, duct sealing, Home Energy Rating System ("HERS") ratings, air balancing, energy management council, and HVAC course enhancements. Consumer education consists of the Consumer's Guide to Efficient AC, Energy Answers fact sheets, the Energy Answer Line, advertising, newsletters and brochures, Website content, energy surveys, and seminars. Technical assistance consists of research results, duct blaster and blower door testing, infrared inspections, sizing calculations, and consulting. The Qualified Contractor Program refers contractors who meet professional standards and training requirements.

For the new residential construction market segment, APS provides trade ally training consisting of building science training (co-sponsored with the Arizona Energy Office), seminars, HVAC training, insulator training, advanced framing, realtor/sales training, HERS ratings, and green building seminars. Consumer education consists of a Homebuyer's Guide, energy cost brochures, sales agent materials, Energy Answers fact sheets, the Energy Answer Line, advertising, newsletters and brochures, Website content, and consumer seminars. Technical assistance for the new residential construction market segment consists of the same activities as for the existing residential segment with the addition of building science studies. The Performance Built Homes program promotes builders who offer homebuyers guaranteed heating and cooling bills. The homes are Energy Star+ and guaranteed to be at least 30 percent more efficient than the Model Energy Code.

APS also has its Energy Wise program which assists low-income residential customers by paying for improvements that reduce energy costs. Measures include heat pumps, air conditioners, water heaters, insulation, and windows.

For the commercial/industrial market segment, APS provides trade ally training consisting of building operator and facility maintenance technician certificates, HVAC courses, building science training, seminars, and Industries of the Future (U.S. Department of Energy program) training. Consumer education consists of the Business Analyzer on-line audit, Energy Answers fact sheets, commercial energy seminars, Website content, newsletters, and brochures. Technical assistance consists of bill history download, bill tracking and analysis, consulting, and Industries of the Future. Through the Power Partners Program, customers pledge to save electricity on peak power days by turning up thermostats, turning off unnecessary lights and equipment, and rescheduling energy-intensive work.

Sulphur Springs Valley Electric Cooperative

Sulphur Springs Valley Electric Cooperative ("SSVEC") has the following DSM programs: Energy Efficient Existing Home Program, Energy Audits/Load Calculations, Touchstone Energy Home Program, DSM Weatherization, and DSM for irrigation/large commercial and industrial customers.

The Energy Efficient Existing Home Program offers a rebate of $250 per home for the installation of air-to-air heat pumps with a minimum SEER (seasonal energy efficiency ratio) of 12 and low interest loans for customers to purchase heat pumps and energy-efficient water heaters. Fifty-six rebates were provided in 2002.

SSVEC provides Energy Audits and Load Calculations through onsite inspections, heat pump and air conditioner sizings and recommendations for better efficiency, and recommendations for cost-effective improvements to the home, such as better windows and more insulation. Thirty-four audits were performed in 2002.

Through the Touchstone Energy Home Program, SSVEC performs inspections and certifies new homes for energy-efficient construction. Builders, HVAC contractors, and customers are trained about the program. Eleven builders participate in the program. SSVEC certified 96 homes in 2002.

DSM for irrigation/large commercial and industrial customers includes energy conservation through equipment upgrades, irrigation rates[1] with load control, and cogeneration[2] opportunities with large customers.

SSVEC also responds to energy usage and billing inquiries. Site visits/audits are performed for customers with unresolved usage complaints. Energy efficiency recommendations are made by analyzing HVAC, thermostat settings, filters, appliances, equipment, and the building envelope. Also analyzed are lifestyle, hours of operation, and type of business. Loans or outside assistance programs are also recommended. SSVEC conducted 385 audits in 2002.

SSVEC conducts new and retrofit building audits by meeting with customers, builders, and contractors about plans and projects; making site visits to measure the home and gather data; providing recommendations about HVAC, building envelope, efficiency ratings, and technology; preparing computer simulations and proposals with kWh and cost comparisons; encouraging customers and builders to qualify for Touchstone Energy Home; and encouraging customers, contractors, and builders to choose high efficiency electric options. In 2002, SSVEC performed 91 of these audits.

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[1] The Commission has not traditionally considered rates to be DSM.
[2] The Commission has not traditionally considered cogeneration to be DSM.

SSVEC has sponsored seminars on the 2000 International Energy Conservation Code, building science, windows, and duct design. SSVEC is looking at potential future programs in the areas of air conditioning controls and small co-generation.

Tucson Electric Power

Tucson Electric Power ("TEP") currently has an education program for commercial and industrial customers. TEP provides on-line services consisting of energy audits through the Business Energy Advisor and quick energy-saving tips through Business Energy Fast Track. An Energy Library will soon be available. TEP also works closely with large commercial customers on demand reduction solutions and provides referrals to ESCOs (energy service companies).

TEP has the following programs for residential customers: Trees Program, Residential Education Strategy, School Education Programs, Home Energy Audit, Low-Income Weatherization, and Guarantee Home Program. The Trees Program is a partnership with Tucson Clean and Beautiful to provide trees for residences, schools, and community projects.

TEP's Residential Education Strategy consists of on-line services of energy audits through the Residential Energy Advisor and quick energy-saving tips through Residential Energy Fast Track. Appliance calculators and an Energy Library will be available on-line soon. Customer education is also provided through the new customer newsletter and energy efficiency brochures.

TEP's School Education Programs include Insulation Station (4th grade), Energy Patrol (K-12 grades), Growing Greener Cities (middle school), and In Concert With the Environment (high school).

For the Low-Income Weatherization program, TEP partners with Tucson Urban League and Pima County Community Services to provide weatherization services and education on energy conservation and weatherization.

TEP guarantees heating and cooling costs for five years through its *Guarantee Home* Program. The fuel-neutral program reduces the summer utility peak by 2.6 kW (53 percent) over the Model Energy Code. In addition, customers with Guaranteed Homes qualify for special rates under TEP's Pricing Plan 201.

UNS Electric

UNS Electric currently has a Commercial Energy Survey program and provides account management for large commercial and industrial customers. For residential customers, UNS Electric provides the following programs: Residential Energy Survey, Residential New Construction (Good Cents), Customer Education, and Website Enhancements (www.uesaz.com).

Southwest Gas

Southwest Gas ("SWG") has two DSM programs for residential customers in Arizona: Energy Advantage Plus and Low Income Energy Conservation. SWG has a DSM Surcharge to recover its pre-approved DSM costs.

The Energy Advantage Plus ("EA+") program targets residential new construction in southern Arizona. It is designed to upgrade the energy efficiency of new homes and is accomplished through thermal shell construction and performance-based practices, along with the installation of higher efficiency mechanical equipment. The energy system of every EA+ builder's design must achieve a minimum 15 percent improvement in performance over standard energy codes. SWG reviews builders' blueprints and provides recommendations to meet program criteria. The house is evaluated as a whole, and criteria consist of either prescriptive standards or performance standards. A sample of homes are inspected and tested for quality construction and proper equipment specifications. SWG also educates consumers, builders, real estate agents, and subcontractors.

The Low Income Energy Conservation ("LIEC") program targets income-qualified customers with homes in need of weatherization measures, LIEC is designed to cost-effectively conserve energy and water, improve the health and safety of participating households, and inform customers of the Low-Income Residential Gas Service Rate. SWG leverages funds with other funding sources and contracts with the Arizona Energy Office to administer the program which is conducted by nine Community Action Agencies. The Community Action Agencies screen requests, conduct energy audits, and install weatherization, health, and safety measures. Each climate zone has a priority list of cost-effective measures that can be installed.

Historical Utility DSM Savings and Costs

One participant developed a standard form that utility participants used to report their historical DSM savings and costs. However, each utility reported data from different time periods. The utilities that provided this information were TEP, UNS Electric, APS, and SWG. A table summarizing the historical data is included as Schedule 2.

From 1992 through 2002, these four utilities spent at least $80,194,000 on DSM programs. As reported by the utilities, electricity savings were at least 407,712 MWh and 368 MW, and natural gas savings were at least 1,428,707 therms.

Energy Service Company ("ESCO") DSM Activities

Johnson Controls, representing the National Association of Energy Service Companies, was invited to present an energy service company ("ESCO") perspective on energy conservation in Arizona. Johnson Controls has identified the following retrofit opportunities, totaling $410 million of construction cost, in Arizona:

K-12	$50 million
higher education	$20 million
healthcare	$70 million
industrial	$50 million
state government	$40 million
local government	$80 million
other	$100 million

The potential savings of the above retrofits could be $60 million per year, with a minimum energy savings of 1 percent per year.

ESCOs in Arizona are finding the greatest opportunities for conservation in buildings within the government sector. HB 2324, signed by the Governor in April 2003, requires 15 percent savings in state buildings by 2011. The Arizona Department of Administration ("ADOA") issued an RFP on November 3, 2004, for conservation in 30 state buildings. Thirty ESCOs asked for documents associated with the RFP.

Performance contracts are designed to have cumulative savings that greatly surpass the cumulative costs. ARS 34-455 allows ADOA to enter into performance contracts with a 15-year payback, but ARS 34-456 says that 50 percent of savings will go to an "energy conservation fund." ARS 15-213 allows school districts to enter into guaranteed costs savings contracts with a 10-year payback. ARS 15-910 addresses excess utility funds.

There are also federal government DSM activities, including the U.S. Green Building Council and Energy Star. Leadership in Energy and Environmental Design ("LEED") has standards for new construction and existing buildings.

Some possible reasons why the opportunities in the industrial sector are not larger include the following:

- Loan payments are often seen by corporations as capital payments, even though the company may be saving more in operations. Financing is usually for capital projects, while the savings are in operations. Large companies often have separate budgets, and accounting systems do not allow the savings in operations to be applied to the capital budget.
- Private-sector decision-making is often out-of-state, while government decision-making is in-state.
- The public sector gets less expensive financing than the private sector.

Primary Criteria for Evaluating DSM Opportunities

Workshop participants developed primary screening criteria to help determine the best DSM opportunities. Those criteria are the following:

- energy savings,
- demand savings,
- cost-effectiveness using the societal test,
- market share/market penetration, and
- feasibility.

In addition, the participants identified key assumptions including market share/market penetration, other DSM activities, and market baseline.

Best DSM Opportunities in Each Market Segment

At the first Workshop, Commissioner Hatch-Miller encouraged the participants to explore the three best DSM opportunities for each customer class. Participants at a later Workshop proposed various DSM programs. These programs were presented as ideas without any adoption by the group as a whole. Further analyses would need to be conducted to determine program cost-effectiveness.

Murphy Consulting

Murphy Consulting proposed an air conditioning program as the most important program for each customer class.

Arizona Energy Office

The Arizona Energy Office presented the following programs:

- *Weatherization Assistance Program ("WAP")*
  Support the federal WAP statewide. WAP reduces energy costs for low-income households by increasing the energy efficiency of homes, while ensuring health and safety. Typical measures include: installing insulation, sealing ducts, tuning and repairing heating and cooling systems, mitigating air infiltration, and reducing electric base load consumption.

- *Residential New Construction*
  Support efforts to incorporate building science (systems approach) techniques throughout the building process. Major focus should include proper design, advanced detailing, and correct installation of ductwork, insulation, and ventilation systems. Key components are education of all building trades, field technical assistance for trades, and monitoring/verification. Support efforts to implement energy codes at local and state levels.

- *Residential Retrofit*
  Focus on training, technical assistance, and monitoring/verification that assists with the introduction of sound building science principles into the home improvement industry. This could include the establishment of required certification for trade members to perform DSM work.

- *Municipal Governments*
  Provide training and technical assistance. Support performance contracting. There are many opportunities in small communities.

- *Schools*
  Provide training and technical assistance. Operation and maintenance training is key. Support performance contracting.

- *Commercial New Construction*
  Support training and technical assistance to trades. Support efforts in design assistance and green building. Support efforts to implement energy codes at the local, state, and national levels. Provide incentives for beyond code (LEEDS).

- *Commercial Retrofits*
  Support training and technical assistance to trades. Support efforts in design assistance and green building. Support performance contracting.

- *Industry*
  Support existing efforts, such as the DOE Industries of the Future and the ASU Industry Assessment Center, to provide training and technical assistance. Use performance contracting.

- *Consumer Products*
  Support (through promotion and incentives) EPA Energy Star products.

Tucson Electric Power and UNS Electric

TEP/UNS Electric presented the following programs:

Industrial

- One-on-one Energy Management Services
- Firm Interruptible Demand[3]
- Education and Training

Commercial

- Small Commercial - Leased Facility

[3] The Commission has not traditionally considered interruptible rates to be DSM.

- Education and Training
- On-line Energy Audit (energy management)

- Small Commercial - Own Facility
  - Facilities Upgrade Program (example: duct sealing)
  - On-line Energy Audit (new and existing facilities)
- Schools
  - Duct Sealing Program
  - Energy Management Services

- Education and Training

Residential

- Guarantee Home Program (new construction)
- On-line Energy Audit (new and existing homes)
- Duct Sealing Program (existing homes)
- Low-E Window Film Program (existing homes)
- Weatherization Program (increase funding)
- Education and Training

Southwest Gas

SWG recommended the following programs:

Residential

- *Low-Income Energy Conservation*
  Provide both home weatherization and consumer education to reduce energy usage in income-qualified residences.

- *Multi-Family New Construction*
  Provide energy-efficient housing in the multi-family sector. Building standards would exceed existing building codes. Upgrade both the building envelope and the appliances. Include an educational component to increase awareness of energy efficiency among consumers, builders, and designers.

- *High-Efficiency Appliances in Retail Stores*
  This program would feature a partnership between the utility and retail stores. Focus would be on building consumer awareness by providing educational materials at the point of purchase and on increasing the availability of high-efficiency equipment in the stores.

- *Single-Family New Construction*
  This educational program would be designed to increase awareness of energy efficiency through training sessions for builders, subcontractors, and sales agents.

It would promote the proper installation of items such as insulation, windows, and HVAC systems.

Commercial

- *Food Service Equipment*
  Educate food service managers about high-efficiency equipment and influence their purchase decisions. Use SWG's existing Food Service Center in Tempe as a training facility to demonstrate the latest, most efficient equipment that is available in the market. Partner with Arizona water agencies to distribute low-flow, dish rinse wands that save both water and energy.

- *High-Efficiency Laundries*
  Encourage the installation of high-efficiency clothes washers and dryers in commercial laundry facilities where large volumes of linens and clothing are washed and dried on a daily basis. Meet with laundry owners and facility managers to help them determine the types of equipment that would best meet their performance and efficiency needs,

- *Efficient Building Design*
  Provide information and continuing education to the building and design community (architects, engineers, designers, and builders) to encourage more energy-efficient new construction.

Industrial

- *Distributed Generation*[4]
  Encourage the installation of technologies such as cogeneration, fuel cells, and microturbines.

- *Irrigation Pumping*
  Encourage the use of high-efficiency, engine-driven irrigation pumping.

- *Technology Information Center*
  Provide technical information to industrial and commercial customers to reduce energy use, lower utility bills, answer questions about energy-efficient technologies, and increase awareness of environmental issues. Information would be provided through an Internet resource website, an "Ask an Expert" hotline, newsletters, and an electronic research library.

DSM Proposals

Participants presented proposals for DSM programs and policies. These program proposals were more detailed than those described in the previous section and often included evaluations using the primary criteria for evaluating DSM opportunities discussed earlier.

[4] The Commission has not traditionally considered distributed generation to be DSM.

However, these proposals did not include methods to obtain any additional funding that might be needed to implement the programs. In addition, the group did not attempt to achieve consensus on which programs should be pursued.

Murphy Consulting

Murphy Consulting proposed that the most important DSM program should involve air conditioning. As peak load increases, generation fuel costs are higher. Reducing air conditioner load would reduce the utility's peak load.

APS Energy Services

APS Energy Services stated that DSM issues may not be utility-oriented because consumers are indifferent; rebates are ineffective; barriers for institutional customer adoption are legislative, not regulatory; and the most effective adoption comes through federal regulations and city mandates. APS Energy Services suggested that residential and small commercial and industrial customers are the best target markets for DSM. Large commercial and industrial customers are not motivated because utility costs represent less than 3 percent of overall operating costs for most, and it is considered a low priority without a huge immediate payback.

Western Resource Advocates

Western Resource Advocates ("WRA") proposed a Shade Tree program. The program would be part of a more comprehensive residential retrofit program, and shade trees should be included with a package of retrofit recommendations depending on characteristics of the houses. Shade trees provide the largest savings when planted on sun-struck sides of target houses. Target houses are (1) those with dual cooling (evaporative cooling and air conditioning), with little or no window area on west facing walls, but with a lot of window area on other walls or (2) those with only air conditioning, single-pane windows, and a lot of window area on the south facing walls.

Implementation of the Shade Tree program should include marketing and consumer education about selecting, locating, planting, and caring for trees. There should also be some spot verification that the trees are planted and located so as to cast shade on the house.

Benefits of the program would include: reduced air conditioning load due to shade, evapo-transpirational cooling, and wind reduction; avoidance and uptake of air pollutants (particulates, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide); reduced carbon dioxide in the atmosphere due to sequestration and avoided electricity generation; avoided runoff; wildlife and aesthetic benefits; and increased property values capitalizing the energy savings and aesthetic benefits.

Assuming 10,000 participating houses with three trees per house, annual savings are estimated to be 1.7 MW (0.057 kW/tree) and 3,840 MWh (128 kWh/tree). The cost would be

$300,000 per year, excluding any rebates. The present value of net benefits would be $25 per tree.

Tucson Electric Power

TEP proposed the following programs:

Existing Residential/Low Income Segment

- *Guarantee Program*
  description = residential new construction;
  estimated participants = 1,000 per year; estimated annual savings = 0.003 MW; estimated annual spending = $1,044,000.

- *On-Line Energy Advisor*
  description = on-line energy audit with bill history download;
  estimated participants = 5,000 per year; estimated annual spending = $70,000.

- *Low-Income Weatherization Program*
  description = weatherization of homes for low-income customers;
  estimated participants = 145 per year; estimated annual spending = $198,000.

- *Academic Education*
  description = education programs for K-12 schools;
  estimated annual spending = $48,000.

- *Trees Program*
  description = desert-adapted trees are given to residential neighborhoods, schools, low-income families, and public areas;
  estimated participants = 4,800 per year; estimated annual spending = $135,000.

New Residential Segment

- *Appliance Rebate Program*
  description = rebate for high efficiency Energy Star appliances;
  estimated participants = 1,000 per year; estimated annual savings = 0.70 MWh; estimated annual spending = $159,000.

- *Air Duct Efficiency Program*
  description = free inspection of a customer's home air conditioning and heating duct system (TEP pays 50 percent of repair costs not to exceed $300);
  estimated participants = 500 per year; estimated annual savings = 0.65 MWh; estimated annual spending = $206,000.

- *Window Replacement Program*
  description = rebate for installing energy-efficient windows (maximum rebate is $500);

estimated participants = 426 per year; estimated annual savings = 0.40 MWh; estimated annual spending = $257,000.

Commercial/Industrial/Institutional Segment

- *C&I Energy Audits*
  description = one-on-one energy management services;
  estimated participants = 20 per year; estimated annual spending = $104,000.

- *C&I Training*
  description = energy-efficiency workshops for facility managers and facility management personnel;
  estimated participants = 300 per year; estimated annual spending = $52,000.

- *C&I Lighting Program*
  description = rebates offered for installation of efficient lighting systems in new and existing facilities;
  estimated participants = 100 per year; estimated annual savings = 0.03 MW and 54 MWh; estimated annual spending = $364,000.

- *On-Line Energy Audit*
  description = on-line energy audit with bill download history;
  estimated participants = 100 per year; estimated annual spending = $75,000.

- *C&I High Efficiency Cooling Systems Program*
  description = rebates offered for installation of unitary air conditioners, heat pumps, and chillers;
  estimated participants = 300 per year; estimated annual savings = 0.3 MW and 540 MWh; estimated annual spending = $588,000.

TEP estimates that implementing the above programs would cost $36,300,000 from 2005 through 2015. The cumulative annual savings would be 3.7 MW and 6,553 MWh. The intention of the proposal is to impact TEP's super peak period. TEP's proposal is based on DSM funding reverting back from renewables.

<u>UNS Electric</u>

UNS Electric proposed the following programs:

Residential Segment

- *Academic Education*
  description = education programs for K-12 schools;
  estimated annual spending = $10,000.

- *Residential HVAC Program*
  description = $500 rebate to replace existing HVAC unit;

estimated participants = 45; estimated annual savings = 0.027 MW and 51.5 MWh; estimated annual spending = $33,334.

- *Customer Education*
  description = trade shows, energy conservation information;
  estimated annual spending = $5,000.

- *On-Line Energy Advisor*
  description = on-line energy audit with bill history download;
  estimated participants = 2,500 per year; estimated annual spending = $12,500.

- *Low-Income Weatherization Program*
  description = weatherization of homes for low-income customers;
  estimated participants = 44 per year.

Commercial/Industrial/Institutional Segment

- *C&I Lighting Program*
  description = rebates up to $500 per customer offered for installation of efficient lighting systems in new and existing facilities;
  estimated participants = 63 per year; estimated annual savings = 0.019 MW and 34 MWh; estimated annual spending = $43,333.

- *On-Line Energy Audit*
  description = on-line energy audit with bill download history;
  estimated participants = 100 per year; estimated annual spending = $12,500.

- *Commercial HVAC Program*
  description = $500 rebates offered for installation of unitary air conditioners, heat pumps, and chillers;
  estimated participants = 95 per year; estimated annual savings = 0.095 MW and 171 MWh; estimated annual spending = $58,333.

UNS Electric estimates that implementing the above programs would cost $1,925,000 from 2005 through 2015. The cumulative annual electricity savings would be 1.6 MW and 2,822 MWh.

So Cool Energy

So Cool Energy proposed a Commercial Solar HVAC program. The company's projects are guaranteed to reduce the consumption of fossil fuel for water heating and HVAC by over 60 percent, for a net cost savings of up to 20 percent. The current cost of Commercial Solar HVAC is $0.50 to $1.50 per watt. Energy service performance contracting can be provided where the energy provider plans, constructs, and finances the facilities. With a small or zero customer down payment, the provider and the customer share the savings over a 15- to 20-year, fixed-price contract. The technology has been used in Europe since 1992 for water heating and space

heating and since 2001 for air conditioning. Project sizes range from 1,000 to 200,000 square feet.

Arizona Public Service

APS stated that spending does not equal results. Arizona has been held up as an example of a market-based approach to energy efficiency at the 2002 National Energy and Environmental Building Association conference and at the Energy Star awards. Arizona is ahead of the nation in many ways. Phoenix leads the nation in guaranteed heating/cooling and Energy Star homes. There is a 50 percent market penetration of Low-E windows in new residential construction. Approximately 90 percent of the replacement HVAC market is 12 SEER or higher. Arizona has much newer commercial building stock than most states and has an active ESCO market.

APS has found that Arizona's load growth is being driven by population and economic growth, larger homes (average square footage increase of more than 20 percent since 1980s), more consumer electronic devices (computers, cell phones, DVDs, etc.), and more business office equipment.

In regard to DSM policy, APS recommended that utilities use a market transformation approach, both expanding and adding new market transformation programs. APS also recommended legislative actions, including establishing a commercial building energy code and clarifying the shared savings issue for state and municipal buildings.

In developing program ideas, APS considered its experience and program history, other utility programs, SWEEP recommendations, market transformation opportunities, diversity of programs, cost effectiveness, equity, customer interest and acceptance, and demand and energy savings (saving peak demand is key).

APS proposed the following programs:

New Residential Segment

- *Building Science Training/Infrared Research/Improved Duct Sealing*
  description = promotes building science principles to builders;
  estimated participants = 11,100; estimated annual savings = 7.7 MW and 16,650 MWh; estimated annual spending = $120,000.

- *Performance Built Home Program*
  description = Energy Star+ performance, expanded to growth areas outside Phoenix;
  estimated participants = 4,500; estimated annual savings = 11.2 MW and 15,750 MWh; estimated annual spending = $350,000.

Existing Residential/Low Income Segment

- *Low Income Weatherization*

description = targets customers in need of assistance, HVAC repair and replacement, building envelope repair/upgrades, some appliances, increase limit on funding per household, increase household income requirements, remove restriction on owner-occupied housing;
estimated participants = 780; estimated annual savings = 0.3 MW and 1,039 MWh; estimated annual spending = $700,000.

- *Consumer Education*
  description = promotes high-efficiency cooling, appliances, etc.;
  estimated participants = 8,840; estimated annual savings = 0.8 MW and 2,546 MWh; estimated annual spending = $180,000.

- *Home Diagnostics and Performance Testing*
  description = promotes home comfort/efficiency tests, such as blower door, duct blaster, and infrared, to customers and provides training for contractors;
  estimated participants = 246; estimated annual savings = 0.1 MW and 197 MWh; estimated annual spending = $50,000.

- *High Efficiency AC Promotion*
  description = replacement of existing HVAC equipment with high-efficiency equipment, shift message to 14 SEER and higher;
  estimated participants = 19,712; estimated annual savings = 4.2 MW and 25,689 MWh; estimated annual spending = $200,000.

- *Qualified Contractor Program*
  description = provides customer referrals to HVAC contractors who meet strict standards and participate in energy efficiency training courses;
  estimated participants = 6,000; estimated annual savings = 0.2 MW and 360 MWh; estimated annual spending = $100,000.

- *TOU[5] Program/Promotion*
  description = helps existing time-of-use customers get the best value from their rate;
  estimated participants = 18,000; estimated annual savings = 11.7 MW; estimated annual spending = $70,000.

- *Explore Direct AC Load Control*
  description = explore potential for direct utility control of home HVAC system during peak load periods;
  estimated participants = 100; estimated annual savings = 0.2 MW; estimated annual spending = $100,000.

[5] The Commission has not traditionally considered time-of-use rates to be DSM.

Commercial/Industrial/Institutional Segment

- *Energy Profile Information and Demand Response*[6]
  description = next-day load profile and analysis for large commercial and industrial customers, help customers operate buildings most efficiently, provide training and education, combine with a demand response program that provides incentives to curtail load on peak days;
  estimated participants = 50; estimated annual savings = 4.4 MW and 9,500 MWh; estimated annual spending = $150,000.

- *Cool Roofs Program*
  description = promotes use of cool roofing materials (light-colored, reflective) to reduce building cooling loads;
  estimated participants = 1,000; estimated annual savings = 0.2 MW and 12,364 MWh; estimated annual spending = $150,000.

- *Institute for Facility Management Education*
  description = provides commercial energy management education for building operators and facility managers, partnered with Electric League and Arizona Energy Office;
  estimated participants = 100; estimated annual savings = 2.2 MW and 10,000 MWh; estimated annual spending = $80,000.

- *Design Assistance*
  description = work with building designers during new construction and major renovations to specify more efficient thermal envelope, mechanical systems, and equipment;
  estimated participants = 13; estimated annual savings = 1.2 MW and 4,940 MWh; estimated annual spending = $250,000.

- *Energy Efficient Schools Program*
  description = demonstration projects, training and design assistance targeted to schools;
  estimated participants = 85; estimated annual savings = 0.1 MW and 3,655 MWh; estimated annual spending = $250,000.

- *Power Partners*
  description = on summer days that exceed 100 degrees, participants pledge to turn up thermostats, turn off unnecessary lights and equipment, and shift the timing of energy-intensive tasks;
  estimated participants = 100; estimated annual savings = 0.2 MW; estimated annual spending = $20,000.

[6] The Commission has not traditionally considered demand response programs to be DSM.

APS estimates that implementing the above programs, including measurement and verification, would cost $33,000,000 from 2005 through 2015. The cumulative annual savings would be 491.7 MW and 1,129,590 MWh.

Southwest Gas

SWG proposed the following programs:

- *Low-Income Energy Conservation*
  description = home weatherization and consumer education for low-income customers;
  estimated participants = 225 homes; estimated annual savings = 1,859 mmBTU and 393,075 gallons water; estimated annual spending = $350,000.

- *Multi-Family New Construction*
  description = energy-efficient new construction for multi-family dwellings;
  estimated participants = 1,134 units; estimated annual savings = 31,957 mmBTU and 8,455,331 gallons water; estimated annual spending = $800,000.

- *Technology Information Center*
  description = energy-efficient information for industrial and commercial customers;
  estimated participants = 12,400 customers; estimated annual spending = $35,000.

SWG estimates that implementing the above programs would cost $11,850,000 from 2005 through 2015. The cumulative annual savings would be 337,151 mmBTU and 88,215,635 gallons water.

Southwest Energy Efficiency Project

Southwest Energy Efficiency Project ("SWEEP") recommended the following programs:

Residential

- *Low/Moderate/Fixed Income*
  Install lighting, appliances, and cooling measures to reduce electricity use. Partner with low-income weatherization programs.

- *Residential New Construction*
  Promote Energy Star homes, train builders and contractors, use energy-efficient HVAC systems approach, and target financial incentives. Reduce summer utility peak demand by about 2 kW per home.

- *Consumer Products*
  Promote Energy Star products and target financial incentives for energy-efficient lighting, appliances, and other consumer products.

- *Existing Residential, with Focus on Residential Cooling/HVAC*
  Replace air conditioners and heat pumps with more energy-efficient ones. Encourage energy-efficiency measures during remodeling, renovation, or retrofit of existing residential buildings.

Commercial, Industrial, and Other Non-Residential

- *Non-Residential (C&I) New Construction, Renovation, and Equipment Replacement*
  Provide design assistance for customers and the design community. Provide prescriptive and custom paths for energy-efficiency measures, including lighting, HVAC, motors/drives, and processes/systems. Provide financial incentives to encourage and leverage customer investment.

- *Non-Residential (C&I) Existing Buildings*
  For large and medium customers, provide prescriptive and custom paths for energy-efficiency measures, including lighting, HVAC, motors/drives, industrial processes, compressed air, and pumping systems. Provide financial incentives to encourage and leverage customer investment.

- *Small Business*
  Provide technical assistance. Use a combination of a financial incentive and pay-as-you-go, on-the-bill financing (with financing capital from the utility) to promote energy-efficient lighting, HVAC, and refrigeration measures.

- *Schools and Local Government*
  Provide technical assistance and building operator training. Use a combination of financial incentives and pay-as-you-go, on-the-bill financing (with financing capital from the utility)

SWEEP estimates that implementing the above programs in APS' service territory would cost $508,297,000 from 2004 through 2015. The cumulative annual savings would be 803.1 MW and 4,986,000 MWh.

Morenci Water & Electric

Morenci Water & Electric ("MWE") believes that conservation can deliver value to individual consumers, the environment, and the overall Arizona electricity market. Conservation is best achieved through a portfolio of energy efficiency initiatives, and a prioritized application of conservation measures makes the best public policy. Pricing realities of the wholesale market should translate into retail rate design, and technology-oriented DSM programs are most productive when rate structures signal the consumer about the wholesale market costs that drive their rates. Informed consumer choices about building design and equipment are crucial to growing and sustaining energy conservation.

MWE proposed the following programs:

- *Time of Use Rates*[7]
  voluntary rate that will aim at aligning the cost of wholesale power for off-peak, on-peak, and possible shoulder peak periods with retail residential rates

- *Efficiency Standards*
  consumer education regarding Life Cycle Cost analysis, energy-efficient design alternatives, and efficient equipment and appliance choices

LightLogix

LightLogix provides voltage control for commercial lighting in parking garages, distribution centers, and large retail centers with long hours. For every $1 million of investment, there would be 55 units installed, 1.1 MW total lighting load reduction, 9,650 MWh per year consumption reduction, additional load reductions on cooling due to lower heat from lights, and $575,000 annual savings (based on $0.06/kWh).

Recommendations for Future Workshop Activities

Workshop participants agreed that, at a minimum, the following topics should be addressed at future DSM Workshops:

- DSM policy statement;
- goals and objectives (either in text or numbers);
- funding levels;
- funding mechanisms;
- utility lost revenue and financial incentives;
- program administration and delivery implementation;
- customer participation;
- measurement and validation;
- cost effectiveness tests; and
- collaboration of utilities.

Staff recommends that the DSM Workshops continue to occur on a monthly basis to address the above issues. Workshop participants believe that they can develop a proposed DSM policy statement within six months of this report. Staff intends to facilitate the development of the policy statement within six months.

Staff recommends filing a final report and possibly recommendations after the Workshops have concluded. Staff anticipates that the second report would be filed by the end of

[7] The Commission has not traditionally considered time-of-use rates to be DSM.

calendar year 2004. Staff further recommends that a recommendation on whether to hold a hearing be deferred until the final Staff report.

Schedule 1
List of Participants

Participant	Organization
Stacy Aguayo	APS Energy Services
Stephen Ahearn	Residential Utility Consumer Office
Bud Annan	Arizona Clean Energy Industries Alliance
Chris Arthur	LightLogix Inc.
Prem Bahl	Arizona Corporation Commission Staff
David Berry	Western Resource Advocates
Jack Blair	Sulphur Springs Valley Electric Cooperative
Gary Blanchard	Salt River Project
Jana Brandt	Salt River Project
Anne Calhoun	Salt River Project
Romi Carrell Wittman	Arizona Electric Power Cooperative
Rebecca Chavez	Tucson Electric Power/UNS Electric
Tim Coley	Residential Utility Consumer Office
David Couture	Tucson Electric Power
Dennis Criswell	Arizona Electric Power Cooperative
Michael Curtis	Mohave Electric Coop/Navopache Electric Cooperative
Randy Despain	Maricopa County
M.L. Diaz Cortez	Residential Utility Consumer Office
Linda Douglas	Tucson Electric Power
John Duncan	Arizona Public Service
Erin Erben	Salt River Project
Lori Glover	So Cool Energy
Charlie Gohman	Arizona Energy Office
Tom Hansen	Tucson Electric Power
Anita Hart	Southwest Gas
Robert Hasman	Johnson Controls, Inc.
Tom Hines	Arizona Public Service
Doug Holton	Salt River Project
Marshall Hunt	RHA
Ryan Johnson	Office of Commissioner Mayes
Barbara Keene	Arizona Corporation Commission Staff
Phil Key	Renewable Energy Leadership Group
Barb Klemstine	Arizona Public Service
Brian Koch	Salt River Project
Cinda LeDesma	Southwest Gas
Paul Li	Law Office of Bob Lynch
Debbie Lindeman	Tucson Electric Power
Sam Lipman	Desert Energy
Craig Marks	Arizona Energy Office
Jay McCarroll	APS Energy Services
Cassius McChesney	Arizona Public Service

Participant	Organization
Mike McElrath	Phelps Dodge
Mark McWhirter	Arizona Energy Office
Bill Meek	Arizona Utility Investors Association
Chuck Miessner	Arizona Public Service
George Miller	Transcon
Jay Moyes	Moyes Storey
Tom Mumaw	Arizona Public Service
Bill Murphy	Murphy Consulting
Terry Orlick	Arizona Public Service
Amanda Ormond	Ormond Group
Cindy Phillips	Salt River Project
Blaise Poole	El Paso Corp.
Steve Reyna	Southwest Gas
Bill Rigsby	Residential Utility Consumer Office
Russ Romney	Martinez & Curtis
Randy Sable	Southwest Gas
Vicki Sandler	APS Energy Services
Jeff Schlegel	Southwest Energy Efficiency Project
Vivian Scott	Southwest Gas
Jeff Seaton	Department of Emergency and Military Affairs
Chuck Sherman	
Chuck Skidmore	City of Scottsdale
Karen Smith	Salt River Project
Michael Spielman	APS Energy Services
Jim Stack	Arizona Solar Energy Association
Jerry Thieken	Salt River Project
Scott Wakefield	Residential Utility Consumer Office
John Wallace	Grand Canyon State Electric Cooperative Association
Bud Walters	Southwest Gas
Bill Wiley	Arizona Public Service
Ray Williamson	Arizona Corporation Commission Staff
Martha Wright	Southwest Gas

Schedule 2
Historical DSM Savings and Costs

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Tucson Electric Power												
Annual Energy Growth Rate		2.6%	5.7%	0.3%	5.1%	2.4%	2.1%	2.1%	5.1%	0.9%	-3.0%	
Annual Peak Demand Growth Rate		-2.7%	6.1%	3.6%	9.4%	2.0%	0.1%	2.5%	7.7%	-2.2%	6.6%	
DSM Expenditures ($1,000)		$2,840	$3,257	$3,362	$2,645	$1,786	$1,605	$2,900	$1,583	$1,462	$1,500	$22,940
Cumulative Annual Savings (MWh)		23,354	40,888	61,642	71,968	75,410	77,235	79,428	79,629	79,629	79,629	79,629
Cumulative Annual Savings (% of Sales)		0.36%	0.59%	0.89%	0.99%	1.01%	1.01%	1.02%	0.97%	0.96%	0.99%	
Cumulative Annual Savings (MW)		6	12	18	23	25	26	27	28	29	31	31
Cumulative Annual Savings (% of Peak)		0.46%	0.84%	1.23%	1.46%	1.52%	1.58%	1.61%	1.55%	1.64%	1.64%	
UNS Electric												
Annual Energy Growth Rate					8.5%	1.7%	3.1%	3.6%	7.9%	6.0%	0.4%	
Annual Peak Demand Growth Rate						2.8%	8.5%	-3.6%	10.3%	6.3%	1.8%	
DSM Expenditures ($1,000)				$1,062	$580	$142	$135	$25	$185	$216	$159	$2,504
Cumulative Annual Savings (MWh)				2.346	8,217	10,622	14,206	14,489	16,625	16,679	20,670	20,670
Cumulative Annual Savings (% of Sales)				0.25%	0.80%	1.01%	1.31%	1.29%	1.37%	1.30%	1.61%	
Cumulative Annual Savings (MW)					2	4	4	5	5	5	8	8
Cumulative Annual Savings (% of Peak)					1.19%	1.66%	1.90%	2.06%	2.14%	2.03%	2.85%	
Arizona Public Service												
Annual Energy Growth Rate		2.1%	6.7%	1.6%	7.2%	4.2%	3.3%	3.0%	6.9%	3.8%	-0.2%	
Annual Peak Demand Growth Rate		0.2%	10.8%	4.9%	3.5%	0.7%	10.0%	-2.7%	11.0%	3.8%	2.0%	
DSM Expenditures ($1,000)	$5,871	$6,150	$5,689	$6,957	$7,699	$5,517	$3,113	$2,210	$873	$4,991	1,113	$50,183
Cumulative Annual Savings (MWh)	23,199	49,579	80,122	111,887	117,083	126,399	153,878	180,795	207,239	243,569	278,021	278,021
Cumulative Annual Savings (% of Sales)	0.14%	0.30%	0.46%	0.63%	0.62%	0.64%	0.75%	0.86%	0.92%	1.04%	1.19%	
Cumulative Annual Savings (MW)	37	64	94	125	147	166	193	214	238	267	295	295
Cumulative Annual Savings (% of Peak)	0.96%	1.68%	2.22%	2.83%	3.22%	3.61%	3.81%	4.34%	4.35%	4.70%	5.09%	
Southwest Gas												
Annual Energy Growth Rate									3.6%	5.8%	-4.2%	
DSM Expenditures ($1,000)								$950.24	$1,119.14	$1,247.83	$1,250	$4,567.21
Cumulative Annual Savings (therms)								282,733	594,430	984,411	1,428,707	1,428,707
Cumulative Annual Savings (% of Sales)								0.1%	0.2%	0.4%	0.5%	
Cumulative Annual Savings (site MWh)								4,664.80	10,646.72	18,838.50	29,392.23	29,392.23
Cumulative Annual Savings (MW)								5.415	12.413	21.969	34.337	34.337
All 4 Utilities												
DSM Expenditures ($1,000)	$5,871	$8,990	$8,946	$11,381	$10,924	$7,445	$4,853	$6,085	$3,760	$7,917	$4,022	$80,194
Cumulative Annual Savings (MWh)	23,199	72,933	121,010	173,531	197,268	212,431	245,319	279,377	314,140	358,715	407,712	407,712
Cumulative Annual Savings (MW)	37	70	106	143	172	195	223	251.415	283.413	322.969	368.337	368.337
Cumulative Annual Savings (therms)								282,733	594,430	984,411	1,428,707	1,428,707

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MEMORANDUM

2004 MAR 15 P 12 28

AZ CORP COMMISSION
DOCUMENT CONTROL

TO: Docket Control

FROM: Ernest G. Johnson
Director
Utilities Division

DATE: March 15, 2004

RE: STAFF REPORT ON DSM WORKSHOP PROGRESS FOR THE GENERIC PROCEEDING CONCERNING ELECTRIC RESTRUCTURING ISSUES, ET AL (DOCKET NOS. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069

Attached is the Staff Report on the progress of the DSM Workshops required by Decision No. 65743 ("Track B").

EGJ:BEK:rdp

Originator: Barbara Keene

Attachment: Original and 14 Copies

Arizona Corporation Commission
DOCKETED

MAR 1 5 2004

DOCKETED BY CAL

Service List for: Generic Proceeding Concerning Electric Restructuring Issues, et al
Docket No. E-00000A-02-0051, et al

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STAFF REPORT
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION

GENERIC PROCEEDING CONCERNING ELECTRIC RESTRUCTURING ISSUES, ET AL

DOCKET NO. E-00000A-02-0051, ET AL

DSM WORKSHOP PROGRESS REPORT

MARCH 15, 2004

STAFF ACKNOWLEDGMENT

The Staff Report on progress of the DSM Workshops for the Generic Proceeding Concerning Electric Restructuring Issues, Docket Nos. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069 and E-01933A-98-0471, was the responsibility of the Staff member listed below.

Barbara Keene

Barbara Keene
Public Utilities Analyst

EXECUTIVE SUMMARY
DSM WORKSHOPS PROGRESS REPORT
DOCKET NOS. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630, E-01933A-02-0069 AND E-01933A-98-0471

The Commission issued Decision No. 65743 (Track B) on March 14, 2003. In that Decision, the Commission ordered Staff to facilitate a workshop process to explore the development of a DSM policy. The exploration was to include an examination of the possible costs and benefits of the policy. Staff was to file a report within 12 months of Decision No. 65743 informing the Commission of the progress achieved in the workshops, including a recommendation on whether hearings should be held.

DSM Workshops were held from October 2003 through February 2004. Information was obtained from utilities concerning the demand-side management (DSM) programs they are currently pursuing and historical costs and savings. Workshop participants developed primary criteria for evaluating DSM opportunities and presented proposals for DSM programs. Participants agreed that there are several topics remaining to be addressed in future Workshops.

Staff recommends that the DSM Workshops continue to occur on a monthly basis to address outstanding issues. Workshop participants believe that they can develop a proposed DSM policy statement within six months of this report. Staff intends to facilitate the development of the policy statement within six months.

Staff recommends filing a final report and possibly recommendations after the Workshops have concluded. Staff anticipates that the second report would be filed by the end of calendar year 2004. Staff further recommends that a recommendation on whether to hold a hearing be deferred until the final Staff report.

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Introduction

The Commission issued Decision No. 65743 ("Track B") on March 14, 2003. In that Decision, the Commission ordered Staff to facilitate a workshop process to explore the development of a DSM policy. The exploration was to include an examination of the possible costs and benefits of the policy. Staff was to file a report within 12 months of Decision No. 65743 informing the Commission of the progress achieved in the workshops, including a recommendation on whether hearings should be held.

The first DSM Workshop was held on October 30, 2003. Subsequent Workshops were held on December 5, 2003; January 15, 2004; and February 13, 2004. Participants included representatives from utilities, state agencies, cities, counties, energy efficiency and environmental advocacy groups, utility investors, energy service companies, electrical districts, product distributors, and large industrial consumers. A list of participants is in Schedule 1.

What is DSM?

Demand-side Management ("DSM") is the planning, implementation, and evaluation of programs to shift peak load to off-peak hours, to reduce peak demand ("kW"), and to reduce energy consumption "(kWh") in a cost-effective manner. DSM programs are also known as conservation or energy efficiency programs. The DSM Workshops have not addressed programs known as demand response programs.

SWEEP Proposal

In November 2002, the Southwest Energy Efficiency Project ("SWEEP") released a report, "The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest." SWEEP reports that electricity demand (kWh) in Arizona is projected to grow 3 percent per year on average between 2003 and 2020 if current policies and trends are maintained. At the first DSM Workshop, SWEEP recommended using energy efficiency measures to reduce electricity demand growth in Arizona to less than 2 percent per year. SWEEP estimates that required utility funding would be about $0.002 per kWh.

Current Utility DSM Activities

Each of the Commission-regulated electric and natural gas utilities with current DSM programs made presentations at the first DSM Workshop. They presented information on the DSM programs they are currently pursuing.

Arizona Public Service

Arizona Public Service ("APS") had rebate/incentive DSM programs before 1996. The company's strategy evolved into a market transformation ("MT") approach in 1996. The foundation of APS' MT strategy consists of research, trade alliances, contractor/builder training, technical/sales support, consumer education, cost-effective DSM, focus on most significant end

uses, and fuel neutrality. Research has shown that the biggest efficiency improvements are to be found in proper installation. Training and education are key.

APS currently has market transformation programs for existing residential, new residential construction, and commercial/industrial market segments. Activities for the existing residential segment are trade ally training, consumer education, technical assistance, and the Qualified Contractor Program. Trade ally training consists of HVAC (heating, ventilating, and air conditioning) education subsidies, building science seminars, duct sealing, Home Energy Rating System ("HERS") ratings, air balancing, energy management council, and HVAC course enhancements. Consumer education consists of the Consumer's Guide to Efficient AC, Energy Answers fact sheets, the Energy Answer Line, advertising, newsletters and brochures, Website content, energy surveys, and seminars. Technical assistance consists of research results, duct blaster and blower door testing, infrared inspections, sizing calculations, and consulting. The Qualified Contractor Program refers contractors who meet professional standards and training requirements.

For the new residential construction market segment, APS provides trade ally training consisting of building science training (co-sponsored with the Arizona Energy Office), seminars, HVAC training, insulator training, advanced framing, realtor/sales training, HERS ratings, and green building seminars. Consumer education consists of a Homebuyer's Guide, energy cost brochures, sales agent materials, Energy Answers fact sheets, the Energy Answer Line, advertising, newsletters and brochures, Website content, and consumer seminars. Technical assistance for the new residential construction market segment consists of the same activities as for the existing residential segment with the addition of building science studies. The Performance Built Homes program promotes builders who offer homebuyers guaranteed heating and cooling bills. The homes are Energy Star+ and guaranteed to be at least 30 percent more efficient than the Model Energy Code.

APS also has its Energy Wise program which assists low-income residential customers by paying for improvements that reduce energy costs. Measures include heat pumps, air conditioners, water heaters, insulation, and windows.

For the commercial/industrial market segment, APS provides trade ally training consisting of building operator and facility maintenance technician certificates, HVAC courses, building science training, seminars, and Industries of the Future (U.S. Department of Energy program) training. Consumer education consists of the Business Analyzer on-line audit, Energy Answers fact sheets, commercial energy seminars, Website content, newsletters, and brochures. Technical assistance consists of bill history download, bill tracking and analysis, consulting, and Industries of the Future. Through the Power Partners Program, customers pledge to save electricity on peak power days by turning up thermostats, turning off unnecessary lights and equipment, and rescheduling energy-intensive work.

Sulphur Springs Valley Electric Cooperative

Sulphur Springs Valley Electric Cooperative ("SSVEC") has the following DSM programs: Energy Efficient Existing Home Program, Energy Audits/Load Calculations, Touchstone Energy Home Program, DSM Weatherization, and DSM for irrigation/large commercial and industrial customers.

The Energy Efficient Existing Home Program offers a rebate of $250 per home for the installation of air-to-air heat pumps with a minimum SEER (seasonal energy efficiency ratio) of 12 and low interest loans for customers to purchase heat pumps and energy-efficient water heaters. Fifty-six rebates were provided in 2002.

SSVEC provides Energy Audits and Load Calculations through onsite inspections, heat pump and air conditioner sizings and recommendations for better efficiency, and recommendations for cost-effective improvements to the home, such as better windows and more insulation. Thirty-four audits were performed in 2002.

Through the Touchstone Energy Home Program, SSVEC performs inspections and certifies new homes for energy-efficient construction. Builders, HVAC contractors, and customers are trained about the program. Eleven builders participate in the program. SSVEC certified 96 homes in 2002.

DSM for irrigation/large commercial and industrial customers includes energy conservation through equipment upgrades, irrigation rates[1] with load control, and cogeneration[2] opportunities with large customers.

SSVEC also responds to energy usage and billing inquiries. Site visits/audits are performed for customers with unresolved usage complaints. Energy efficiency recommendations are made by analyzing HVAC, thermostat settings, filters, appliances, equipment, and the building envelope. Also analyzed are lifestyle, hours of operation, and type of business. Loans or outside assistance programs are also recommended. SSVEC conducted 385 audits in 2002.

SSVEC conducts new and retrofit building audits by meeting with customers, builders, and contractors about plans and projects; making site visits to measure the home and gather data; providing recommendations about HVAC, building envelope, efficiency ratings, and technology; preparing computer simulations and proposals with kWh and cost comparisons; encouraging customers and builders to qualify for Touchstone Energy Home; and encouraging customers, contractors, and builders to choose high efficiency electric options. In 2002, SSVEC performed 91 of these audits.

[1] The Commission has not traditionally considered rates to be DSM.
[2] The Commission has not traditionally considered cogeneration to be DSM.

SSVEC has sponsored seminars on the 2000 International Energy Conservation Code, building science, windows, and duct design. SSVEC is looking at potential future programs in the areas of air conditioning controls and small co-generation.

Tucson Electric Power

Tucson Electric Power ("TEP") currently has an education program for commercial and industrial customers. TEP provides on-line services consisting of energy audits through the Business Energy Advisor and quick energy-saving tips through Business Energy Fast Track. An Energy Library will soon be available. TEP also works closely with large commercial customers on demand reduction solutions and provides referrals to ESCOs (energy service companies).

TEP has the following programs for residential customers: Trees Program, Residential Education Strategy, School Education Programs, Home Energy Audit, Low-Income Weatherization, and Guarantee Home Program. The Trees Program is a partnership with Tucson Clean and Beautiful to provide trees for residences, schools, and community projects.

TEP's Residential Education Strategy consists of on-line services of energy audits through the Residential Energy Advisor and quick energy-saving tips through Residential Energy Fast Track. Appliance calculators and an Energy Library will be available on-line soon. Customer education is also provided through the new customer newsletter and energy efficiency brochures.

TEP's School Education Programs include Insulation Station (4th grade), Energy Patrol (K-12 grades), Growing Greener Cities (middle school), and In Concert With the Environment (high school).

For the Low-Income Weatherization program, TEP partners with Tucson Urban League and Pima County Community Services to provide weatherization services and education on energy conservation and weatherization.

TEP guarantees heating and cooling costs for five years through its Guarantee Home Program. The fuel-neutral program reduces the summer utility peak by 2.6 kW (53 percent) over the Model Energy Code. In addition, customers with Guaranteed Homes qualify for special rates under TEP's Pricing Plan 201.

UNS Electric

UNS Electric currently has a Commercial Energy Survey program and provides account management for large commercial and industrial customers. For residential customers, UNS Electric provides the following programs: Residential Energy Survey, Residential New Construction (Good Cents), Customer Education, and Website Enhancements (www.uesaz.com).

Southwest Gas

Southwest Gas ("SWG") has two DSM programs for residential customers in Arizona: Energy Advantage Plus and Low Income Energy Conservation. SWG has a DSM Surcharge to recover its pre-approved DSM costs.

The Energy Advantage Plus ("EA+") program targets residential new construction in southern Arizona. It is designed to upgrade the energy efficiency of new homes and is accomplished through thermal shell construction and performance-based practices, along with the installation of higher efficiency mechanical equipment. The energy system of every EA+ builder's design must achieve a minimum 15 percent improvement in performance over standard energy codes. SWG reviews builders' blueprints and provides recommendations to meet program criteria. The house is evaluated as a whole, and criteria consist of either prescriptive standards or performance standards. A sample of homes are inspected and tested for quality construction and proper equipment specifications. SWG also educates consumers, builders, real estate agents, and subcontractors.

The Low Income Energy Conservation ("LIEC") program targets income-qualified customers with homes in need of weatherization measures, LIEC is designed to cost-effectively conserve energy and water, improve the health and safety of participating households, and inform customers of the Low-Income Residential Gas Service Rate. SWG leverages funds with other funding sources and contracts with the Arizona Energy Office to administer the program which is conducted by nine Community Action Agencies. The Community Action Agencies screen requests, conduct energy audits, and install weatherization, health, and safety measures. Each climate zone has a priority list of cost-effective measures that can be installed.

Historical Utility DSM Savings and Costs

One participant developed a standard form that utility participants used to report their historical DSM savings and costs. However, each utility reported data from different time periods. The utilities that provided this information were TEP, UNS Electric, APS, and SWG. A table summarizing the historical data is included as Schedule 2.

From 1992 through 2002, these four utilities spent at least $80,194,000 on DSM programs. As reported by the utilities, electricity savings were at least 407,712 MWh and 368 MW, and natural gas savings were at least 1,428,707 therms.

Energy Service Company ("ESCO") DSM Activities

Johnson Controls, representing the National Association of Energy Service Companies, was invited to present an energy service company ("ESCO") perspective on energy conservation in Arizona. Johnson Controls has identified the following retrofit opportunities, totaling $410 million of construction cost, in Arizona:

K-12	$50 million
higher education	$20 million
healthcare	$70 million
industrial	$50 million
state government	$40 million
local government	$80 million
other	$100 million

The potential savings of the above retrofits could be $60 million per year, with a minimum energy savings of 1 percent per year.

ESCOs in Arizona are finding the greatest opportunities for conservation in buildings within the government sector. HB 2324, signed by the Governor in April 2003, requires 15 percent savings in state buildings by 2011. The Arizona Department of Administration ("ADOA") issued an RFP on November 3, 2004, for conservation in 30 state buildings. Thirty ESCOs asked for documents associated with the RFP.

Performance contracts are designed to have cumulative savings that greatly surpass the cumulative costs. ARS 34-455 allows ADOA to enter into performance contracts with a 15-year payback, but ARS 34-456 says that 50 percent of savings will go to an "energy conservation fund." ARS 15-213 allows school districts to enter into guaranteed costs savings contracts with a 10-year payback. ARS 15-910 addresses excess utility funds.

There are also federal government DSM activities, including the U.S. Green Building Council and Energy Star. Leadership in Energy and Environmental Design ("LEED") has standards for new construction and existing buildings.

Some possible reasons why the opportunities in the industrial sector are not larger include the following:

- Loan payments are often seen by corporations as capital payments, even though the company may be saving more in operations. Financing is usually for capital projects, while the savings are in operations. Large companies often have separate budgets, and accounting systems do not allow the savings in operations to be applied to the capital budget.
- Private-sector decision-making is often out-of-state, while government decision-making is in-state.
- The public sector gets less expensive financing than the private sector.

Primary Criteria for Evaluating DSM Opportunities

Workshop participants developed primary screening criteria to help determine the best DSM opportunities. Those criteria are the following:

- energy savings,
- demand savings,
- cost-effectiveness using the societal test,
- market share/market penetration, and
- feasibility.

In addition, the participants identified key assumptions including market share/market penetration, other DSM activities, and market baseline.

Best DSM Opportunities in Each Market Segment

At the first Workshop, Commissioner Hatch-Miller encouraged the participants to explore the three best DSM opportunities for each customer class. Participants at a later Workshop proposed various DSM programs. These programs were presented as ideas without any adoption by the group as a whole. Further analyses would need to be conducted to determine program cost-effectiveness.

Murphy Consulting

Murphy Consulting proposed an air conditioning program as the most important program for each customer class.

Arizona Energy Office

The Arizona Energy Office presented the following programs:

- *Weatherization Assistance Program ("WAP")*
  Support the federal WAP statewide. WAP reduces energy costs for low-income households by increasing the energy efficiency of homes, while ensuring health and safety. Typical measures include: installing insulation, sealing ducts, tuning and repairing heating and cooling systems, mitigating air infiltration, and reducing electric base load consumption.

- *Residential New Construction*
  Support efforts to incorporate building science (systems approach) techniques throughout the building process. Major focus should include proper design, advanced detailing, and correct installation of ductwork, insulation, and ventilation systems. Key components are education of all building trades, field technical assistance for trades, and monitoring/verification. Support efforts to implement energy codes at local and state levels.

- *Residential Retrofit*
  Focus on training, technical assistance, and monitoring/verification that assists with the introduction of sound building science principles into the home improvement industry. This could include the establishment of required certification for trade members to perform DSM work.

- *Municipal Governments*
  Provide training and technical assistance. Support performance contracting. There are many opportunities in small communities.

- *Schools*
  Provide training and technical assistance. Operation and maintenance training is key. Support performance contracting.

- *Commercial New Construction*
  Support training and technical assistance to trades. Support efforts in design assistance and green building. Support efforts to implement energy codes at the local, state, and national levels. Provide incentives for beyond code (LEEDS).

- *Commercial Retrofits*
  Support training and technical assistance to trades. Support efforts in design assistance and green building. Support performance contracting.

- *Industry*
  Support existing efforts, such as the DOE Industries of the Future and the ASU Industry Assessment Center, to provide training and technical assistance. Use performance contracting.

- *Consumer Products*
  Support (through promotion and incentives) EPA Energy Star products.

Tucson Electric Power and UNS Electric

TEP/UNS Electric presented the following programs:

Industrial
- One-on-one Energy Management Services
- Firm Interruptible Demand[3]
- Education and Training

Commercial
- Small Commercial - Leased Facility

[3] The Commission has not traditionally considered interruptible rates to be DSM.

- Education and Training
- On-line Energy Audit (energy management)

- Small Commercial - Own Facility
  - Facilities Upgrade Program (example: duct sealing)
  - On-line Energy Audit (new and existing facilities)
- Schools
  - Duct Sealing Program
  - Energy Management Services

- Education and Training

Residential
- Guarantee Home Program (new construction)
- On-line Energy Audit (new and existing homes)
- Duct Sealing Program (existing homes)
- Low-E Window Film Program (existing homes)
- Weatherization Program (increase funding)
- Education and Training

Southwest Gas

SWG recommended the following programs:

Residential
- *Low-Income Energy Conservation*
  Provide both home weatherization and consumer education to reduce energy usage in income-qualified residences.

- *Multi-Family New Construction*
  Provide energy-efficient housing in the multi-family sector. Building standards would exceed existing building codes. Upgrade both the building envelope and the appliances. Include an educational component to increase awareness of energy efficiency among consumers, builders, and designers.

- *High-Efficiency Appliances in Retail Stores*
  This program would feature a partnership between the utility and retail stores. Focus would be on building consumer awareness by providing educational materials at the point of purchase and on increasing the availability of high-efficiency equipment in the stores.

- *Single-Family New Construction*
  This educational program would be designed to increase awareness of energy efficiency through training sessions for builders, subcontractors, and sales agents.

It would promote the proper installation of items such as insulation, windows, and HVAC systems.

Commercial

- *Food Service Equipment*
  Educate food service managers about high-efficiency equipment and influence their purchase decisions. Use SWG's existing Food Service Center in Tempe as a training facility to demonstrate the latest, most efficient equipment that is available in the market. Partner with Arizona water agencies to distribute low-flow, dish rinse wands that save both water and energy.

- *High-Efficiency Laundries*
  Encourage the installation of high-efficiency clothes washers and dryers in commercial laundry facilities where large volumes of linens and clothing are washed and dried on a daily basis. Meet with laundry owners and facility managers to help them determine the types of equipment that would best meet their performance and efficiency needs,

- *Efficient Building Design*
  Provide information and continuing education to the building and design community (architects, engineers, designers, and builders) to encourage more energy-efficient new construction.

Industrial

- *Distributed Generation*[4]
  Encourage the installation of technologies such as cogeneration, fuel cells, and microturbines.

- *Irrigation Pumping*
  Encourage the use of high-efficiency, engine-driven irrigation pumping.

- *Technology Information Center*
  Provide technical information to industrial and commercial customers to reduce energy use, lower utility bills, answer questions about energy-efficient technologies, and increase awareness of environmental issues. Information would be provided through an Internet resource website, an "Ask an Expert" hotline, newsletters, and an electronic research library.

DSM Proposals

Participants presented proposals for DSM programs and policies. These program proposals were more detailed than those described in the previous section and often included evaluations using the primary criteria for evaluating DSM opportunities discussed earlier.

[4] The Commission has not traditionally considered distributed generation to be DSM.

However, these proposals did not include methods to obtain any additional funding that might be needed to implement the programs. In addition, the group did not attempt to achieve consensus on which programs should be pursued.

Murphy Consulting

Murphy Consulting proposed that the most important DSM program should involve air conditioning. As peak load increases, generation fuel costs are higher. Reducing air conditioner load would reduce the utility's peak load.

APS Energy Services

APS Energy Services stated that DSM issues may not be utility-oriented because consumers are indifferent; rebates are ineffective; barriers for institutional customer adoption are legislative, not regulatory; and the most effective adoption comes through federal regulations and city mandates. APS Energy Services suggested that residential and small commercial and industrial customers are the best target markets for DSM. Large commercial and industrial customers are not motivated because utility costs represent less than 3 percent of overall operating costs for most, and it is considered a low priority without a huge immediate payback.

Western Resource Advocates

Western Resource Advocates ("WRA") proposed a Shade Tree program. The program would be part of a more comprehensive residential retrofit program, and shade trees should be included with a package of retrofit recommendations depending on characteristics of the houses. Shade trees provide the largest savings when planted on sun-struck sides of target houses. Target houses are (1) those with dual cooling (evaporative cooling and air conditioning), with little or no window area on west facing walls, but with a lot of window area on other walls or (2) those with only air conditioning, single-pane windows, and a lot of window area on the south facing walls.

Implementation of the Shade Tree program should include marketing and consumer education about selecting, locating, planting, and caring for trees. There should also be some spot verification that the trees are planted and located so as to cast shade on the house.

Benefits of the program would include: reduced air conditioning load due to shade, evapo-transpirational cooling, and wind reduction; avoidance and uptake of air pollutants (particulates, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide); reduced carbon dioxide in the atmosphere due to sequestration and avoided electricity generation; avoided runoff; wildlife and aesthetic benefits; and increased property values capitalizing the energy savings and aesthetic benefits.

Assuming 10,000 participating houses with three trees per house, annual savings are estimated to be 1.7 MW (0.057 kW/tree) and 3,840 MWh (128 kWh/tree). The cost would be

$300,000 per year, excluding any rebates. The present value of net benefits would be $25 per tree.

Tucson Electric Power

TEP proposed the following programs:

Existing Residential/Low Income Segment

- *Guarantee Program*
  description = residential new construction;
  estimated participants = 1,000 per year; estimated annual savings = 0.003 MW;
  estimated annual spending = $1,044,000.

- *On-Line Energy Advisor*
  description = on-line energy audit with bill history download;
  estimated participants = 5,000 per year; estimated annual spending = $70,000.

- *Low-Income Weatherization Program*
  description = weatherization of homes for low-income customers;
  estimated participants = 145 per year; estimated annual spending = $198,000.

- *Academic Education*
  description = education programs for K-12 schools;
  estimated annual spending = $48,000.

- *Trees Program*
  description = desert-adapted trees are given to residential neighborhoods, schools, low-income families, and public areas;
  estimated participants = 4,800 per year; estimated annual spending = $135,000.

New Residential Segment

- *Appliance Rebate Program*
  description = rebate for high efficiency Energy Star appliances;
  estimated participants = 1,000 per year; estimated annual savings = 0.70 MWh;
  estimated annual spending = $159,000.

- *Air Duct Efficiency Program*
  description = free inspection of a customer's home air conditioning and heating duct system (TEP pays 50 percent of repair costs not to exceed $300);
  estimated participants = 500 per year; estimated annual savings = 0.65 MWh;
  estimated annual spending = $206,000.

- *Window Replacement Program*
  description = rebate for installing energy-efficient windows (maximum rebate is $500);

estimated participants = 426 per year; estimated annual savings = 0.40 MWh; estimated annual spending = $257,000.

Commercial/Industrial/Institutional Segment

- *C&I Energy Audits*
  description = one-on-one energy management services;
  estimated participants = 20 per year; estimated annual spending = $104,000.

- *C&I Training*
  description = energy-efficiency workshops for facility managers and facility management personnel;
  estimated participants = 300 per year; estimated annual spending = $52,000.

- *C&I Lighting Program*
  description = rebates offered for installation of efficient lighting systems in new and existing facilities;
  estimated participants = 100 per year; estimated annual savings = 0.03 MW and 54 MWh; estimated annual spending = $364,000.

- *On-Line Energy Audit*
  description = on-line energy audit with bill download history;
  estimated participants = 100 per year; estimated annual spending = $75,000.

- *C&I High Efficiency Cooling Systems Program*
  description = rebates offered for installation of unitary air conditioners, heat pumps, and chillers;
  estimated participants = 300 per year; estimated annual savings = 0.3 MW and 540 MWh; estimated annual spending = $588,000.

TEP estimates that implementing the above programs would cost $36,300,000 from 2005 through 2015. The cumulative annual savings would be 3.7 MW and 6,553 MWh. The intention of the proposal is to impact TEP's super peak period. TEP's proposal is based on DSM funding reverting back from renewables.

<u>UNS Electric</u>

UNS Electric proposed the following programs:

Residential Segment

- *Academic Education*
  description = education programs for K-12 schools;
  estimated annual spending = $10,000.

- *Residential HVAC Program*
  description = $500 rebate to replace existing HVAC unit;

estimated participants = 45; estimated annual savings = 0.027 MW and 51.5 MWh; estimated annual spending = $33,334.

- *Customer Education*
  description = trade shows, energy conservation information;
  estimated annual spending = $5,000.

- *On-Line Energy Advisor*
  description = on-line energy audit with bill history download;
  estimated participants = 2,500 per year; estimated annual spending = $12,500.

- *Low-Income Weatherization Program*
  description = weatherization of homes for low-income customers;
  estimated participants = 44 per year.

Commercial/Industrial/Institutional Segment

- *C&I Lighting Program*
  description = rebates up to $500 per customer offered for installation of efficient lighting systems in new and existing facilities;
  estimated participants = 63 per year; estimated annual savings = 0.019 MW and 34 MWh; estimated annual spending = $43,333.

- *On-Line Energy Audit*
  description = on-line energy audit with bill download history;
  estimated participants = 100 per year; estimated annual spending = $12,500.

- *Commercial HVAC Program*
  description = $500 rebates offered for installation of unitary air conditioners, heat pumps, and chillers;
  estimated participants = 95 per year; estimated annual savings = 0.095 MW and 171 MWh; estimated annual spending = $58,333.

UNS Electric estimates that implementing the above programs would cost $1,925,000 from 2005 through 2015. The cumulative annual electricity savings would be 1.6 MW and 2,822 MWh.

<u>So Cool Energy</u>

So Cool Energy proposed a Commercial Solar HVAC program. The company's projects are guaranteed to reduce the consumption of fossil fuel for water heating and HVAC by over 60 percent, for a net cost savings of up to 20 percent. The current cost of Commercial Solar HVAC is $0.50 to $1.50 per watt. Energy service performance contracting can be provided where the energy provider plans, constructs, and finances the facilities. With a small or zero customer down payment, the provider and the customer share the savings over a 15- to 20-year, fixed-price contract. The technology has been used in Europe since 1992 for water heating and space

heating and since 2001 for air conditioning. Project sizes range from 1,000 to 200,000 square feet.

Arizona Public Service

APS stated that spending does not equal results. Arizona has been held up as an example of a market-based approach to energy efficiency at the 2002 National Energy and Environmental Building Association conference and at the Energy Star awards. Arizona is ahead of the nation in many ways. Phoenix leads the nation in guaranteed heating/cooling and Energy Star homes. There is a 50 percent market penetration of Low-E windows in new residential construction. Approximately 90 percent of the replacement HVAC market is 12 SEER or higher. Arizona has much newer commercial building stock than most states and has an active ESCO market.

APS has found that Arizona's load growth is being driven by population and economic growth, larger homes (average square footage increase of more than 20 percent since 1980s), more consumer electronic devices (computers, cell phones, DVDs, etc.), and more business office equipment.

In regard to DSM policy, APS recommended that utilities use a market transformation approach, both expanding and adding new market transformation programs. APS also recommended legislative actions, including establishing a commercial building energy code and clarifying the shared savings issue for state and municipal buildings.

In developing program ideas, APS considered its experience and program history, other utility programs, SWEEP recommendations, market transformation opportunities, diversity of programs, cost effectiveness, equity, customer interest and acceptance, and demand and energy savings (saving peak demand is key).

APS proposed the following programs:

New Residential Segment

- *Building Science Training/Infrared Research/Improved Duct Sealing*
  description = promotes building science principles to builders;
  estimated participants = 11,100; estimated annual savings = 7.7 MW and 16,650 MWh; estimated annual spending = $120,000.

- *Performance Built Home Program*
  description = Energy Star+ performance, expanded to growth areas outside Phoenix;
  estimated participants = 4,500; estimated annual savings = 11.2 MW and 15,750 MWh; estimated annual spending = $350,000.

Existing Residential/Low Income Segment

- *Low Income Weatherization*

description = targets customers in need of assistance, HVAC repair and replacement, building envelope repair/upgrades, some appliances, increase limit on funding per household, increase household income requirements, remove restriction on owner-occupied housing;
estimated participants = 780; estimated annual savings = 0.3 MW and 1,039 MWh; estimated annual spending = $700,000.

- *Consumer Education*
  description = promotes high-efficiency cooling, appliances, etc.;
  estimated participants = 8,840; estimated annual savings = 0.8 MW and 2,546 MWh; estimated annual spending = $180,000.

- *Home Diagnostics and Performance Testing*
  description = promotes home comfort/efficiency tests, such as blower door, duct blaster, and infrared, to customers and provides training for contractors;
  estimated participants = 246; estimated annual savings = 0.1 MW and 197 MWh; estimated annual spending = $50,000.

- *High Efficiency AC Promotion*
  description = replacement of existing HVAC equipment with high-efficiency equipment, shift message to 14 SEER and higher;
  estimated participants = 19,712; estimated annual savings = 4.2 MW and 25,689 MWh; estimated annual spending = $200,000.

- *Qualified Contractor Program*
  description = provides customer referrals to HVAC contractors who meet strict standards and participate in energy efficiency training courses;
  estimated participants = 6,000; estimated annual savings = 0.2 MW and 360 MWh; estimated annual spending = $100,000.

- *TOU[5] Program/Promotion*
  description = helps existing time-of-use customers get the best value from their rate;
  estimated participants = 18,000; estimated annual savings = 11.7 MW; estimated annual spending = $70,000.

- *Explore Direct AC Load Control*
  description = explore potential for direct utility control of home HVAC system during peak load periods;
  estimated participants = 100; estimated annual savings = 0.2 MW; estimated annual spending = $100,000.

[5] The Commission has not traditionally considered time-of-use rates to be DSM.

Commercial/Industrial/Institutional Segment

- *Energy Profile Information and Demand Response*[6]
  description = next-day load profile and analysis for large commercial and industrial customers, help customers operate buildings most efficiently, provide training and education, combine with a demand response program that provides incentives to curtail load on peak days;
  estimated participants = 50; estimated annual savings = 4.4 MW and 9,500 MWh; estimated annual spending = $150,000.

- *Cool Roofs Program*
  description = promotes use of cool roofing materials (light-colored, reflective) to reduce building cooling loads;
  estimated participants = 1,000; estimated annual savings = 0.2 MW and 12,364 MWh; estimated annual spending = $150,000.

- *Institute for Facility Management Education*
  description = provides commercial energy management education for building operators and facility managers, partnered with Electric League and Arizona Energy Office;
  estimated participants = 100; estimated annual savings = 2.2 MW and 10,000 MWh; estimated annual spending = $80,000.

- *Design Assistance*
  description = work with building designers during new construction and major renovations to specify more efficient thermal envelope, mechanical systems, and equipment;
  estimated participants = 13; estimated annual savings = 1.2 MW and 4,940 MWh; estimated annual spending = $250,000.

- *Energy Efficient Schools Program*
  description = demonstration projects, training and design assistance targeted to schools;
  estimated participants = 85; estimated annual savings = 0.1 MW and 3,655 MWh; estimated annual spending = $250,000.

- *Power Partners*
  description = on summer days that exceed 100 degrees, participants pledge to turn up thermostats, turn off unnecessary lights and equipment, and shift the timing of energy-intensive tasks;
  estimated participants = 100; estimated annual savings = 0.2 MW; estimated annual spending = $20,000.

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[6] The Commission has not traditionally considered demand response programs to be DSM.

APS estimates that implementing the above programs, including measurement and verification, would cost $33,000,000 from 2005 through 2015. The cumulative annual savings would be 491.7 MW and 1,129,590 MWh.

Southwest Gas

SWG proposed the following programs:

- *Low-Income Energy Conservation*
  description = home weatherization and consumer education for low-income customers;
  estimated participants = 225 homes; estimated annual savings = 1,859 mmBTU and 393,075 gallons water; estimated annual spending = $350,000.

- *Multi-Family New Construction*
  description = energy-efficient new construction for multi-family dwellings;
  estimated participants = 1,134 units; estimated annual savings = 31,957 mmBTU and 8,455,331 gallons water; estimated annual spending = $800,000.

- *Technology Information Center*
  description = energy-efficient information for industrial and commercial customers;
  estimated participants = 12,400 customers; estimated annual spending = $35,000.

SWG estimates that implementing the above programs would cost $11,850,000 from 2005 through 2015. The cumulative annual savings would be 337,151 mmBTU and 88,215,635 gallons water.

Southwest Energy Efficiency Project

Southwest Energy Efficiency Project ("SWEEP") recommended the following programs:

Residential

- *Low/Moderate/Fixed Income*
  Install lighting, appliances, and cooling measures to reduce electricity use. Partner with low-income weatherization programs.

- *Residential New Construction*
  Promote Energy Star homes, train builders and contractors, use energy-efficient HVAC systems approach, and target financial incentives. Reduce summer utility peak demand by about 2 kW per home.

- *Consumer Products*
  Promote Energy Star products and target financial incentives for energy-efficient lighting, appliances, and other consumer products.

- *Existing Residential, with Focus on Residential Cooling/HVAC*
  Replace air conditioners and heat pumps with more energy-efficient ones. Encourage energy-efficiency measures during remodeling, renovation, or retrofit of existing residential buildings.

Commercial, Industrial, and Other Non-Residential

- *Non-Residential (C&I) New Construction, Renovation, and Equipment Replacement*
  Provide design assistance for customers and the design community. Provide prescriptive and custom paths for energy-efficiency measures, including lighting, HVAC, motors/drives, and processes/systems. Provide financial incentives to encourage and leverage customer investment.

- *Non-Residential (C&I) Existing Buildings*
  For large and medium customers, provide prescriptive and custom paths for energy-efficiency measures, including lighting, HVAC, motors/drives, industrial processes, compressed air, and pumping systems. Provide financial incentives to encourage and leverage customer investment.

- *Small Business*
  Provide technical assistance. Use a combination of a financial incentive and pay-as-you-go, on-the-bill financing (with financing capital from the utility) to promote energy-efficient lighting, HVAC, and refrigeration measures.

- *Schools and Local Government*
  Provide technical assistance and building operator training. Use a combination of financial incentives and pay-as-you-go, on-the-bill financing (with financing capital from the utility)

SWEEP estimates that implementing the above programs in APS' service territory would cost $508,297,000 from 2004 through 2015. The cumulative annual savings would be 803.1 MW and 4,986,000 MWh.

Morenci Water & Electric

Morenci Water & Electric ("MWE") believes that conservation can deliver value to individual consumers, the environment, and the overall Arizona electricity market. Conservation is best achieved through a portfolio of energy efficiency initiatives, and a prioritized application of conservation measures makes the best public policy. Pricing realities of the wholesale market should translate into retail rate design, and technology-oriented DSM programs are most productive when rate structures signal the consumer about the wholesale market costs that drive their rates. Informed consumer choices about building design and equipment are crucial to growing and sustaining energy conservation.

MWE proposed the following programs:

- *Time of Use Rates*[7]
  voluntary rate that will aim at aligning the cost of wholesale power for off-peak, on-peak, and possible shoulder peak periods with retail residential rates

- *Efficiency Standards*
  consumer education regarding Life Cycle Cost analysis, energy-efficient design alternatives, and efficient equipment and appliance choices

LightLogix

LightLogix provides voltage control for commercial lighting in parking garages, distribution centers, and large retail centers with long hours. For every $1 million of investment, there would be 55 units installed, 1.1 MW total lighting load reduction, 9,650 MWh per year consumption reduction, additional load reductions on cooling due to lower heat from lights, and $575,000 annual savings (based on $0.06/kWh).

Recommendations for Future Workshop Activities

Workshop participants agreed that, at a minimum, the following topics should be addressed at future DSM Workshops:

- DSM policy statement;
- goals and objectives (either in text or numbers);
- funding levels;
- funding mechanisms;
- utility lost revenue and financial incentives;
- program administration and delivery implementation;
- customer participation;
- measurement and validation;
- cost effectiveness tests; and
- collaboration of utilities.

Staff recommends that the DSM Workshops continue to occur on a monthly basis to address the above issues. Workshop participants believe that they can develop a proposed DSM policy statement within six months of this report. Staff intends to facilitate the development of the policy statement within six months.

Staff recommends filing a final report and possibly recommendations after the Workshops have concluded. Staff anticipates that the second report would be filed by the end of

[7] The Commission has not traditionally considered time-of-use rates to be DSM.

calendar year 2004. Staff further recommends that a recommendation on whether to hold a hearing be deferred until the final Staff report.

Schedule 1
List of Participants

Participant	Organization
Stacy Aguayo	APS Energy Services
Stephen Ahearn	Residential Utility Consumer Office
Bud Annan	Arizona Clean Energy Industries Alliance
Chris Arthur	LightLogix Inc.
Prem Bahl	Arizona Corporation Commission Staff
David Berry	Western Resource Advocates
Jack Blair	Sulphur Springs Valley Electric Cooperative
Gary Blanchard	Salt River Project
Jana Brandt	Salt River Project
Anne Calhoun	Salt River Project
Romi Carrell Wittman	Arizona Electric Power Cooperative
Rebecca Chavez	Tucson Electric Power/UNS Electric
Tim Coley	Residential Utility Consumer Office
David Couture	Tucson Electric Power
Dennis Criswell	Arizona Electric Power Cooperative
Michael Curtis	Mohave Electric Coop/Navopache Electric Cooperative
Randy Despain	Maricopa County
M.L. Diaz Cortez	Residential Utility Consumer Office
Linda Douglas	Tucson Electric Power
John Duncan	Arizona Public Service
Erin Erben	Salt River Project
Lori Glover	So Cool Energy
Charlie Gohman	Arizona Energy Office
Tom Hansen	Tucson Electric Power
Anita Hart	Southwest Gas
Robert Hasman	Johnson Controls, Inc.
Tom Hines	Arizona Public Service
Doug Holton	Salt River Project
Marshall Hunt	RHA
Ryan Johnson	Office of Commissioner Mayes
Barbara Keene	Arizona Corporation Commission Staff
Phil Key	Renewable Energy Leadership Group
Barb Klemstine	Arizona Public Service
Brian Koch	Salt River Project
Cinda LeDesma	Southwest Gas
Paul Li	Law Office of Bob Lynch
Debbie Lindeman	Tucson Electric Power
Sam Lipman	Desert Energy
Craig Marks	Arizona Energy Office
Jay McCarroll	APS Energy Services
Cassius McChesney	Arizona Public Service

Participant	Organization
Mike McElrath	Phelps Dodge
Mark McWhirter	Arizona Energy Office
Bill Meek	Arizona Utility Investors Association
Chuck Miessner	Arizona Public Service
George Miller	Transcon
Jay Moyes	Moyes Storey
Tom Mumaw	Arizona Public Service
Bill Murphy	Murphy Consulting
Terry Orlick	Arizona Public Service
Amanda Ormond	Ormond Group
Cindy Phillips	Salt River Project
Blaise Poole	El Paso Corp.
Steve Reyna	Southwest Gas
Bill Rigsby	Residential Utility Consumer Office
Russ Romney	Martinez & Curtis
Randy Sable	Southwest Gas
Vicki Sandler	APS Energy Services
Jeff Schlegel	Southwest Energy Efficiency Project
Vivian Scott	Southwest Gas
Jeff Seaton	Department of Emergency and Military Affairs
Chuck Sherman	
Chuck Skidmore	City of Scottsdale
Karen Smith	Salt River Project
Michael Spielman	APS Energy Services
Jim Stack	Arizona Solar Energy Association
Jerry Thieken	Salt River Project
Scott Wakefield	Residential Utility Consumer Office
John Wallace	Grand Canyon State Electric Cooperative Association
Bud Walters	Southwest Gas
Bill Wiley	Arizona Public Service
Ray Williamson	Arizona Corporation Commission Staff
Martha Wright	Southwest Gas

Schedule 2
Historical DSM Savings and Costs

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Tucson Electric Power												
Annual Energy Growth Rate		2.6%	5.7%	0.3%	5.1%	2.4%	2.1%	2.1%	5.1%	0.9%	-3.0%	
Annual Peak Demand Growth Rate		-2.7%	6.1%	3.6%	9.4%	2.0%	0.1%	2.5%	7.7%	-2.2%	6.6%	
DSM Expenditures ($1,000)		$2,840	$3,257	$3,362	$2,645	$1,786	$1,605	$2,900	$1,583	$1,462	$1,500	$22,940
Cumulative Annual Savings (MWh)		23,354	40,888	61,642	71,968	75,410	77,235	79,428	79,629	79,629	79,629	79,629
Cumulative Annual Savings (% of Sales)		0.36%	0.59%	0.89%	0.99%	1.01%	1.01%	1.02%	0.97%	0.96%	0.99%	
Cumulative Annual Savings (MW)		6	12	18	23	25	26	27	28	29	31	31
Cumulative Annual Savings (% of Peak)		0.46%	0.84%	1.23%	1.46%	1.52%	1.58%	1.61%	1.55%	1.64%	1.64%	
UNS Electric												
Annual Energy Growth Rate					8.5%	1.7%	3.1%	3.6%	7.9%	6.0%	0.4%	
Annual Peak Demand Growth Rate						2.8%	8.5%	-3.6%	10.3%	6.3%	1.8%	
DSM Expenditures ($1,000)				$1,062	$580	$142	$135	$25	$185	$216	$159	$2,504
Cumulative Annual Savings (MWh)				2.346	8,217	10,622	14,206	14,489	16,625	16,679	20,670	20,670
Cumulative Annual Savings (% of Sales)				0.25%	0.80%	1.01%	1.31%	1.29%	1.37%	1.30%	1.61%	
Cumulative Annual Savings (MW)					2	4	4	5	5	5	8	8
Cumulative Annual Savings (% of Peak)					1.19%	1.66%	1.90%	2.06%	2.14%	2.03%	2.85%	
Arizona Public Service												
Annual Energy Growth Rate		2.1%	6.7%	1.6%	7.2%	4.2%	3.3%	3.0%	6.9%	3.8%	-0.2%	
Annual Peak Demand Growth Rate		0.2%	10.8%	4.9%	3.5%	0.7%	10.0%	-2.7%	11.0%	3.8%	2.0%	
DSM Expenditures ($1,000)	$5,871	$6,150	$5,689	$6,957	$7,699	$5,517	$3,113	$2,210	$873	$4,991	1,113	$50,183
Cumulative Annual Savings (MWh)	23,199	49,579	80,122	111,887	117,083	126,399	153,878	180,795	207,239	243,569	278,021	278,021
Cumulative Annual Savings (% of Sales)	0.14%	0.30%	0.46%	0.63%	0.62%	0.64%	0.75%	0.86%	0.92%	1.04%	1.19%	
Cumulative Annual Savings (MW)	37	64	94	125	147	166	193	214	238	267	295	295
Cumulative Annual Savings (% of Peak)	0.96%	1.68%	2.22%	2.83%	3.22%	3.61%	3.81%	4.34%	4.35%	4.70%	5.09%	
Southwest Gas												
Annual Energy Growth Rate									3.6%	5.8%	-4.2%	
DSM Expenditures ($1,000)								$950.24	$1,119.14	$1,247.83	$1,250	$4,567.21
Cumulative Annual Savings (therms)								282,733	594,430	984,411	1,428,707	1,428,707
Cumulative Annual Savings (% of Sales)								0.1%	0.2%	0.4%	0.5%	
Cumulative Annual Savings (site MWh)								4,664.80	10,646.72	18,838.50	29,392.23	29,392.23
Cumulative Annual Savings (MW)								5.415	12.413	21.969	34.337	34.337
All 4 Utilities												
DSM Expenditures ($1,000)	$5,871	$8,990	$8,946	$11,381	$10,924	$7,445	$4,853	$6,085	$3,760	$7,917	$4,022	$80,194
Cumulative Annual Savings (MWh)	23,199	72,933	121,010	173,531	197,268	212,431	245,319	279,377	314,140	358,715	407,712	407,712
Cumulative Annual Savings (MW)	37	70	106	143	172	195	223	251.415	283.413	322.969	368.337	368.337
Cumulative Annual Savings (therms)								282,733	594,430	984,411	1,428,707	1,428,707