BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of West Penn Power Company d/b/a Allegheny Power for Approval of its Energy Efficiency and Conservation Plan, Approval of Recovery of Costs through a Reconcilable Adjustment Clause, and Approval of Matters Relating to the Energy Efficiency and Conservation Plan	:	Docket No. M-2009-2093218

DIRECT TESTIMONY OF

ETHAN L. COHEN

ON BEHALF OF

WEST PENN POWER COMPANY d/b/a/ ALLEGHENY POWER

STATEMENT NO. 4

Dated: June 29, 2009

TESTIMONY OF

ETHAN L. COHEN

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I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, EMPLOYMENT AND BUSINESS ADDRESS.

A. My name is Ethan L. Cohen. I am a Senior Manager with EDS, an HP Company in the Applications Services Field Operations, Americas, Energy organization. EDS, an HP Company, is headquartered at 5400 Legacy Drive, Plano, Texas 75024.

Q. IN WHAT CAPACITY HAVE YOU BEEN RETAINED?

A. I have been retained by West Penn Power Company d/b/a Allegheny Power ("Allegheny Power") to consult with the company and to prepare this testimony related to information technology ("IT"), Advanced Metering Infrastructure ("AMI"), Smart Metering, smart meter related rate offerings and Smart Grid in the utility industry generally, and at Allegheny Power more specifically.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. Prior to joining EDS, an HP Company, I led the Utility and Energy Technology Practice at UtiliPoint International. I am a strategy and technology advisory consultant whose work has focused on environment, sustainability, AMI, Smart Grid, and capital project strategies using real options finance. My other previous roles include leadership as

Manager at Blue Ridge Partners, Research Director of Energy and Communications at Aberdeen Group, and Senior Utility and Energy Analyst at the Yankee Group.

I graduated from Vassar College, Poughkeepsie, New York, with a Bachelor of Arts degree in Political Science, Subject Matter Honors and a correlate in History, in May of 1996. Upon graduation, I matriculated at Brandeis University, Waltham, Massachusetts where I graduated with a Masters Degree in Comparative History in May of 1997. I have recently graduated on June 6, 2009, from Boston University's Executive MBA Program, Boston, Massachusetts, with a Masters of Business Administration (MBA) degree with a concentration in business management. Appendix A contains my professional resume.

Q. HAVE YOU PREVIOUSLY TESTIFIED ON UTILITY ISSUES?

A. Yes. I have provided testimony support to other companies in a number of utility proceedings, including prudence audit proceedings of Dayton Power & Light on behalf of the Public Utility Commission of Ohio related to customer information systems and other utility IT. I have also participated in the development of utility IT and utility operations benchmarking reports that have been filed in public utility commission dockets at several Canadian utilities for the Alberta Energy and Utilities Board and the British Columbia Utilities Commission.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of Allegheny Power.

II. PURPOSE OF TESTIMONY AND BODY OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide information and support for AMI, Smart Metering, Smart Grid and Allegheny Power's Energy Efficiency and Conservation ("EE&C") and Demand Response ("DR") programs and rate offerings as submitted in this case. My testimony reflects nearly thirteen years of experience with the technologies, issues and benefits of utility programs aimed at energy efficiency, conservation, demand response and the infrastructure and technologies that support these important utility energy efficiency, energy conservation and demand response programs and rate offerings.

Q. DO YOU HAVE AN OPINION ON THE PUBLIC INTEREST BENEFITS OF IMPLEMENTING SMART METER TECHNOLOGIES?

A. The availability of clean, reliable and affordable energy is essential to the economic welfare and security of our nation. We can improve our energy supply through increased use of new renewable and distributed energy sources, provided that we can make them widely accessible to industry, businesses and consumers through the nation's electric

power grid. We can also consume energy responsibly. We can conserve energy and bring energy efficiency to our nation by making modest changes in our behaviors, lifestyles, and habits and we can assist utilities in bringing demand response to fruition. This, however, is not an easy task given the current state of the electric power grid.

Massive changes to utility infrastructure, information technology resources, and business operations as well as further regulatory changes will be essential to accelerate the adoption of Smart Grids. As an integrated end-to-end solution, Smart Grid and an important part of the Smart Grid, Smart Metering, also known AMI, creates value and benefit throughout the utility system. Smart Grid and AMI add value to utility customers and to society at large in the form of energy efficiency, fewer outages, more efficient utility operations and less carbon. However, utility plans for Smart Grid and AMI have to be structured to assure that the entire value creation is included in the benefit analysis such that utilities can be enabled to capture new efficiencies in their business that meet the test for appropriate rate base recovery.

Q. WHAT IS ADVANCED METERING INFRASTRUCTURE?

A. Throughout this testimony, I use the definition of AMI adopted by the Federal Energy Regulatory Commission ("FERC"). This definition states that AMI is a metering system that records customer consumption (and possibly other parameters) hourly or more

frequently and that provides for daily or more frequent transmittal of measurements over a communication network to a central collection point. AMI includes the communications hardware and software and associated system and data management software that create a network between advanced meters and utility business systems and which allows collection and distribution of information to customers and other parties such as competitive retail providers, in addition to providing it to the utility itself. This definition is consistent with the definition of smart meter technology found in Act 129.

Q. WHAT IS YOUR OPINION ABOUT THE APPROACH TO ENERGY EFFICIENCY AND ENERGY CONSERVATION AND DEMAND RESPONSE USING AMI THAT IS PROPOSED IN THIS CASE?

A. In my view, Allegheny Power's reliance on an AMI based approach to energy efficiency, conservation and demand response is critical to the Company's ability to meet Act 129 mandated reduction targets. In developing EE&C and DR programs and rate offerings that utilize AMI, Allegheny Power has assumed a system-wide deployment across its service territory. This assumption is vital as it underpins the company's planning for changes in technology, operations, business process and business systems. Although the company has, in accordance with industry best practice, planned for system-wide rollout in stages, the company has also planned for system wide deployment of AMI in Pennsylvania in order to achieve Act 129 energy and demand reduction requirements.

Without AMI, those reduction requirements will not be achieved in Allegheny Power's service territory.

Based on detailed analysis, Allegheny Power is relying on AMI deployment in the Allegheny Power service territory because of the fact that an AMI system loses some of its value if it is restricted to certain segments of the customer base. Further, since there is significant variation of technology within the rubric of AMI, Allegheny Power is designing an AMI system to include the technologies needed to perform, at a minimum, the objectives described in this case at the least cost, while also leaving open the option to add on to or modify the AMI system as the technology evolves.

In its 2008 Assessment of Demand Response and Advanced Metering (December 2008), the Federal Energy Regulatory Commission reported that advanced metering penetration and potential peak load reduction from demand response have increased since 2006. The FERC also reported that there has been significant activity to promote demand response or to remove barriers to demand response occurring at the state, federal, and company (utility) levels. Specifically, the results of the 2008 FERC Demand Response and Advanced Metering Survey (2008 FERC Survey) indicate that advanced metering penetration (i.e., the ratio of advanced meters to all installed meters) has reached about 4.7 percent for the United States. Additionally, the 2008 FERC Survey indicates that about eight percent of customers in the United States are in some kind of demand response program. There have also been large increases in customer enrollment and the

number of entities that offer demand response programs; for example, the number of entities offering real-time pricing increased significantly since 2006. The potential demand response resource contribution from all U.S. demand response programs is estimated to be close to 41,000 MW, or about 5.8 percent of U.S. peak demands. This represents an increase of about 3,400 MW from the 2006 estimate. This progress in adoption of advanced metering and the benefits produced is highly laudable.

The importance of AMI and DR programs and rate offerings in the Allegheny Power service territory cannot be overstated. AMI will enable Allegheny Power to establish a durable capability to promote energy efficiency and conservation, lower ratepayer energy costs over the long term, lower bills for many customers across each of the company's customer segments, and improve customer service.

Q. WHAT OBSTACLES TO MEETING THE MANDATED ACT 129 REDUCTIONS DOES AMI ELIMINATE?

A. A fundamental benefit of AMI is the ability it provides Allegheny Power to offer all customers rates that vary with the time of usage, and thus better match the costs of the system. This in turn induces customers to reduce usage during critical periods of especially high cost and high environmental impact. I applaud the efforts of the Pennsylvania Public Utility Commission ("PAPUC") to remove regulatory barriers limiting customer participation in demand response, peak reduction, and critical period

pricing programs. However, many obstacles remain. One such barrier of particular importance to Allegheny Power is the limited number of retail customers on time based rates and the constraints imposed on Pennsylvania utilities in customer selection of time based rates.

Q. IN YOUR VIEW IS THE AMI DEPLOYMENT THAT UNDERLIES ALLEGHENY POWER'S ACT 129 PLAN A PRUDENT INVESTMENT FOR THE COMPANY TO PURSUE?

A. Yes. A significant challenge to Allegheny Power in implementing AMI is the scale of financial investment required to deploy enabling technologies during an economic downturn. I note that the deployment of advanced meters and other enabling technologies requires very significant outlays of capital on the part of utilities. AMI involves changing out 100 percent of residential and small commercial meters, replacing them with more expensive meters, installing a system-wide communications network, developing a new meter data management system, and rewriting software and business operations protocols to make optimal use of the new data and operational capabilities.

It has been an established principal in utility regulatory filings across the nation, that utility investment must be deemed used and useful (within the appropriate context of deployment time) in the service of its customers, its benefits must exceed its costs, and it also must be more cost-effective than all reasonable alternatives that exist for

accomplishing the same functions or achieving the same benefits. I would assert that Allegheny Power investment in AMI is a prudent, useful investment because enabling technology, such as AMI, home area networks, and smart thermostats, are necessary in order to fully develop demand response at the residential level. Without such enabling technology, utilities are less able to encourage energy conservation, facilitate customer demand response, measure reductions in consumption resulting from demand response programs, and compensate customers for these consumption reductions.

Generally, in submissions before state commissions, utilities have requested approval for AMI deployment plans, by demonstrating a positive cost-benefit business case for proposed AMI implementation. Allegheny Power believes that it has a positive cost-benefit case for AMI investment with a large fraction of AMI costs (ranging from 50 percent to 90 percent) being justified by a reduction in traditional utility costs of operations or improved services, such as avoided meter-reading costs, faster outage detection, improved customer service, and better management of customer connections and disconnections. Allegheny Power also expects to achieve some projected benefits from the demand response enabled by an AMI system, but is constrained by Act 129 regarding investment and recovery in operations. Hence, I appeal to the Commission to study how capital expenditures related to Allegheny Power's future Advanced Metering and Smart Grid investments might be addressed.

Q. ARE THERE INVESTMENT ISSUES RELATED TO THE DEPLOYMENT OF AMI?

A. Yes. I would call attention to the issue that unless all customers are metered and billed off the same data management system, Allegheny Power may have to maintain more than one customer information, customer management, and customer billing system. In Allegheny Power's current circumstance, the capabilities of its legacy customer information and customer management systems are not adequate to ensure high quality customer service and operations in an AMI enabled service territory. While it may be possible to implement AMI without replacing Allegheny Power's legacy customer information, management and billing systems, it is not sensible to implement the entire AMI on a piecemeal basis without the timely benefits of a modern, fully capable system for managing customer accounts and customer billing in the context of AMI.

Q. WHAT ARE THE SPECIFIC SERVICE QUALITY IMPROVEMENTS ENABLED BY AMI?

A. AMI permits an array of utility service quality improvements. Many of the functionalities that AMI makes possible not only save a utility in operational costs, but also improve the quality of service provided to customers. For example, more frequent meter-reading gives customers better information on their changing usage and electricity costs, in turn making it easier for customers to budget for such costs. Similarly, by

eliminating the need for estimated bills, AMI makes it possible for customers to have timely and accurate readings of their actual usage, and receive bills that do not require adjustment. This accuracy in turn helps with electricity cost budgeting. Estimated bills also create many billing disputes that are not only costly to the utility, but aggravating and time-consuming for customers and even regulators. More timely and accurate meter readings based on AMI should also help to alleviate customer concern about bill accuracy and bill timeliness.

AMI also enables utilities to more quickly and more accurately identifying outage locations, dispatch crews more efficiently, and restore customers more rapidly. These capabilities provide significant benefit to consumers. As this Commission is well aware, outages, slow restoration time, and lack of good information regarding outage time is a source of considerable frustration to consumers.

Further, AMI permits improved tamper detection and helps prevent electricity theft. AMI also enables much better grid voltage and phase monitoring that subsequently leads to improvements in voltage stability and distribution reliability. Better load data from AMI and interval metering is also used for more efficient system planning and reduced cost of transmission and distribution infrastructure.

Q. HOW SHOULD THE COMMISSION VIEW ALLEGHENY POWER'S RELIANCE ON AMI AND RELATED RATES TO MEET ACT 129 ENERGY EFFICIENCEY AND CONSERVATION AND DEMAND RESPONSE TARGETS?

A. Allegheny Power's plan relies on AMI and the Company's portfolio of rates, specifically the Residential Efficiency Rewards Rate, the Pay Ahead (Smart) Service Rate, the Critical Peak Rebate (CPR) Rate, the Time of Use (TOU) With Critical Peak Pricing Rate, and the Hourly Pricing Option (HPO) Rate to achieve Act 129 mandate targets. These rate offerings are detailed in Sections 3.2 through 3.5 of the EE&C Plan. These rates based on AMI provide the company with a durable capability to promote energy efficiency and conservation, demand response, lower ratepayer energy costs over the long term, lower bills for many customers across each of the company's customer segments, and improved customer service.

Allegheny Power's plan is highly consistent with the approach adopted by many of our nation's other leading utilities that have embraced AMI and a portfolio of dynamic rates. Like other utilities, Allegheny Power's proposed adoption of dynamic rates provides not only current benefit but enables future benefit. Anticipating the future, and with the benefit of AMI, Allegheny Power could choose to file additional rates that fall into the following three categories:

- *Fixed-period critical peak pricing*: In fixed-period critical peak pricing, the time and duration of the price increase are predetermined, but the days when the events will be called are not. The maximum number of days called per year is also usually predetermined. The events are typically called the day before so that customers have time to plan to reduce consumption.

- *Variable-period critical peak pricing*: In variable-period critical peak pricing, the time, duration and day of the price increase are not predetermined. The events are usually called on the day of the event. Variable-period critical peak pricing typically applies when devices are available that allow automatic responses to critical peak prices, such as communicating thermostats.

- *Variable peak pricing*: The critical peak prices in the prior two types of critical peak pricing are fixed in rate schedules. Under variable peak pricing, the off-peak and shoulder-period energy prices would be set in advance for only a designated length of time, such as a month or more, based on wholesale prices and market conditions. The advantage of variable peak pricing is that it more directly links the wholesale market to retail pricing.

Q. HOW SHOULD THE COMMISSION VIEW THE IMPACT OF AMI AND TIME VARYING RATES ON RESIDENTIAL CUSTOMERS, ESPECIALLY LOW-INCOME CUSTOMERS?

A. The Commission should always act in the best interest of the Commonwealth and its citizens. I can verify that Allegheny Power has taken concerns about the impact of AMI deployment on residential customers, especially low-income customers, very seriously. I understand the concerns of the various consumer advocates and stakeholders who wish to seek guarantees that with AMI: 1) customers will see real savings, 2) disabled, poor, and elderly customers will not be harmed by bearing disproportionate cost burdens compared with the benefits they receive from AMI, and 3) AMI will not be used to remotely disconnect or limit a customer's electric use without required safeguards being maintained. Allegheny Power's energy conservation and demand response programs in this filing directly address these concerns principally through good program design. For example, one specific approach to enabling customers to benefit from the use of AMI is through the use of peak-time rebates program where customers benefit from decreasing their energy consumption at times of peak prices, and yet be held harmless if they do not decrease their load.

Q. DO LOW-INCOME CUSTOMERS SUFFER ADVERSE ECONOMIC OR LIFESTYLE AFFECTS FROM THE INITIATION OF DYNAMIC PRICING,

TIME VARYING PRICING, OR DEMAND RESPONSE PROGRAMS THAT ARE ENABLED BY AMI?

A. The short answer is no, although care must be taken through pricing options to ensure that high usage, low-income customers receive benefits. In examining this issue, it is very important that there is robust knowledge of the substance of the specific demand response programs in question and the different rate constructs that underpin and enable these programs. Also vital to a full understanding, is an ability to differentiate between the merits and limitations of individual demand response programs on their own separate warrants versus an evaluation of package rates that in portfolio can enable utilities to provide the best overall opportunity for nearly all customers to participate in and benefit from demand response. Finally, it is important to be specific in one's description of rate programs. In the testimony that follows, I will endeavor to differentiate between, provide insight into, and delimit the constraints of demand response programs and describe why the provisioning of Allegheny's portfolio of time based rates that includes a Residential Efficiency Rewards Rate, a Pay Ahead (Smart) Service Rate, a Critical Peak Rebate (CPR) Rate, a Time of Use (TOU) With Critical Peak Pricing Rate and an Hourly Pricing Option (HPO) Rate is good for electricity customers in Allegheny Power's service territory.

First and foremost it is important to recognize that dynamic pricing in and of itself is not a demand response program. Dynamic pricing is a concept that underlies many time

varying rate structures, often called dynamic rates, that are designed in principle to provide electric customers with lower prices during most hours of the summer while raising prices significantly for a small percentage of hours when system conditions are critical (typically in most jurisdictions in the United States 2 to 3 percent of all summer hours).

The primary attraction of dynamic rates such as critical peak pricing (CPP) or real-time pricing (RTP) is that these rates provide direct economic incentives to electric customers to reduce electricity usage when the electrical system is most stressed because they reflect daily peak marginal costs. Similarly, CPP, RTP, or Critical Peak Rebate (CPR) rates -- also known as a Peak Time Rebate (PTR) rate-- have been proven to be effective at encouraging residential customers to conserve energy and become active participants in demand response with subsequent economic, environmental, and societal benefit accruing both at the individual customer and aggregate system levels.

Despite the clear energy efficiency and conservation, economic, environmental, and societal benefits that flow from dynamic electricity pricing, some have expressed concern that dynamic rates may adversely impact low-income customers. While this is a noble and socially responsible concern, it is becoming quite clear that this concern is frequently overstated and is increasingly foundationless.

By analyzing the growing body of research and data from dynamic rates programs across the United States and North America, one can readily conclude that a portfolio of dynamic rates, such as Allegheny Power's portfolio included in this filing, provide the opportunity for all customers to obtain economic and other benefits without suffering adverse affects. Some of the rates pilots that have yielded data and analysis that support this conclusion include but are not limited to pilots at Ameren UE, Missouri; Anaheim Public Utilities, California; BC Hydro, British Columbia, Canada; Commonwealth Edison, Illinois; Hawaiian Electric, Hawaii; Idaho Power, Idaho; Ontario, Canada; Pepco, Washington, D.C.; Public Service Electric & Gas, New Jersey and the California Statewide Pricing Pilot (SPP) 2003-04.

Of particular interest to the question about the impact of dynamic pricing on low-income residential customers are the empirical results of the California SPP which show that there is no statistically significant difference in the amount of bill-savings differentiated across income groups. This means that high-income customers on a dynamic rate do not benefit more than low-income customers, on average. However, taking usage into account, low-income customers in very high usage groups may find it difficult to "save money" under a CPP rate. From a policy perspective, alternative dynamic pricing options should be considered for this group of high-usage, low-income customers. One obvious solution to this limitation of CPP is to offer a peak-time rebate (PTR) or CPR rather than CPP to this specific group of high-usage, low-income customers.

In the District of Columbia, as part of its dynamic pricing pilot program, the utility, Pepco, is currently offering a PTR to customers that are currently on the Residential Aid Discount (RAD) program that has offset any undesirable or potentially deleterious effects of dynamic rates for ultra-low income customers. More generally, PTR rates are both attractive to utility customers and are a highly effective means for encouraging demand response and positive changes in electricity behavior. Under a PTR, customers remain on the static rate but receive a rebate for lowering their usage during critical peak hours below what they would have consumed normally during those hours.

In addition to concern about the adverse impacts of dynamic rates on low income customers, some individuals and groups have argued that dynamic rates should by targeted toward the large users of electricity in the residential sector while others have also questioned whether dynamic pricing should be offered to low-income customers who are also large users. While seemingly sensible, these arguments are recently showing themselves to be both too facile and contradictory to the data analyzed from different national dynamic rates programs.

Again, in looking at the California SPP data and other analysis, it is readily understandable that only a small percentage of low-income customers are also high-usage customers. Even among these high usage, low-income customers, the data show that

these customers respond as much as (or more than) high-income customers. Hence, the correct, empirical, data supported, conclusion is that under CPP and CPR rates, almost all residential customers, including high usage low-income customers can and will save both energy and money.

The California SPP and other industry pricing data further indicates that:

- Low-usage electricity residential customers and high usage electricity customers have both statistically significant and recognizable energy savings. Therefore, targeting dynamic pricing only to high-usage customers (as a proxy for high income as some have suggested) makes little sense from a policy perspective.
- Low usage customers are highly likely to experience bill savings regardless of income group.
- For the few low-income customers with high usage that may not benefit from CPP, an alternative CPP or CPR dynamic rate can be offered which will provide benefits.

Better still, by offering all residential customers a Time of Use (TOU) With Critical Peak Pricing Rate, utilities like Allegheny Power are ensuring that customers in virtually every income class can be encouraged to participate in demand response and subsequently save both money and energy.

In summary, there are many reasons to move forward with dynamic rate options for the vast majority of customers. Most important to remember, is that it is proven that customers respond to price signals and, as a result, customers on dynamic rates cost less to serve than those on standard flat or static rates. Second, a large majority of customers that have participated in the nation's dynamic rate programs, when surveyed, have said that they believe that dynamic rates should be offered to all residential customers. Finally, dynamic rates give customers more control over their electric bill. If a very small percentage of low-income customers with high usage are economically disadvantaged by a single dynamic rate such as CPP, then one solution is to offer a PTR or CPR rate to these customers. However, for the low-income customers in the low-usage category the CPP has been shown to be economically beneficial. Hence, I conclude that Allegheny Power's portfolio approach to offering time varying rates, specifically CPP, and CPR rates is sound and recommendable practice for utilities and policy makers in Pennsylvania.

Q. DOES THE USE OF MORE DYNAMIC PRICING METHODS AND AMI ASSUME THAT EVERY CUSTOMER HAS THE ABILITY TO RESPOND TO HOURLY OR DAILY PRICE SIGNALS?

A. Yes, within Allegheny Power's EE&C and DR Programs and with AMI all customers will have the opportunity and the ability to respond to hourly or daily price signals. In

fact, there is a large and growing body of industry evidence indicating that residential customers can and will respond to time-varying prices and, in particular, dynamic price signals such as critical peak pricing and peak time rebates. Based these industry studies, average, residential customers will reduce energy use on critical days by an amount ranging from 11 percent to 25 percent in response to prices or incentives that are between four and six times higher than the average price they would have paid under a standard tariff. Further, Allegheny Power's programs assume that every customer in the company's service territory will be enabled by the company to participate in a variety of EE&C and DR programs and rate offerings that are proposed in this filing. Allegheny Power's EE&C and DR programs and rate offerings are sufficiently varied and several do and do not use AMI. Even where low-income renters may lack control over appliances provided by landlords Allegheny Power has designed programs to provide incentive for both landlord and tenant to conserve energy and participate in demand response. Finally, all of Allegheny Power's customers will benefit from the company's planned customer education efforts.

Q. WILL HIGHER USAGE RESIDENTIAL, COMMERCIAL, OR INDUSTRIAL CUSTOMERS WHO HAVE GREATER FLEXIBILITY TO REDUCE OR SHIFT USAGE AWAY FROM EXPENSIVE PEAK HOURS EXPERIENCE BENEFITS?

A. Allegheny Power's thoughtful program design makes it possible for all customers to affordably participate in EE&C and DR programs, some of which take advantage of

AMI. Moreover, the anticipated decrease in energy use from large customers during high-cost periods can generate substantial savings to lower usage customers and to society as a whole. Further, market price benefits of demand reductions can be substantial, even with quite modest reductions in peak demand. Not every customer must reduce load in order for demand reductions to produce benefits for all customers. For example, roughly 80 percent of the total demand reduction for customers on the CPP tariff in California (2006) was provided by only about 30 percent of customers. The majority of customers on the California CPP pilot tariff (2006) reduced load by less than the average value while others reduced load much more. The benefits derived from high responders, both high usage and low usage customers, whether in the form of lower market clearing prices or avoided investment in generation, would accrue to all customers, not just those that reduce demand. That is, customers who participate in demand response via time-varying tariffs and reduce demand on high cost days provide positive economic benefits to themselves and to all customers regardless of the size of their own specific usage profile.

Q. IS DEMAND RESPONSE AVAILABLE TO CUSTOMERS WITH A FAIRLY CONSTANT USAGE PROFILE OR WHO USE A LOW LEVEL OF ELECTRICITY?

A. I do not agree that utility customers with a constant usage profiles or low usage profiles do not have demand elasticity or any other limiting factor that would prevent them from participating in energy conservation or demand response. Even a modest conservation through the use of, for example, Energy Star appliances or the installation of compact fluorescent bulbs ("CFLs") produces meaningful and significant energy conservation and demand reduction. Further, a growing body of industry evidence shows that customers find dynamic rate options not only to be manageable, but preferable to more static, conventional, rate options. Studies also show that, once customers experience time-varying rates, many prefer them over standard tariffs. The claim that customers don't like and might be harmed by price volatility is largely irrelevant, as most time-varying prices are not volatile. They simply offer prices that vary over time. I would also point out that the AMI related rates proposed by Allegheny Power in their EE&C Plan are "opt in" rates, and not mandatory.

There is no credible evidence that low-income and elderly customers may suffer dire health and safety consequences as a result of "doing without" in the middle of a heat wave in order to avoid higher bills. Even if such hypothetical claims are true, they are not applicable to a critical peak time rebate rate ("CPR"), where bills do not increase in the absence of a change in energy use, but could fall if a consumer adjusts his or her energy use. Even if a TOU rate was implemented on an opt-out basis, customers typically find that the kinds of changes that are sufficient to reduce demand during high

priced periods can be achieved based on behavioral changes that, at worst, impose minor inconveniences, such as a change in time for doing clothes washing.

The health and welfare of all electricity customers is of the highest concern. Allegheny Power currently maintains a database of customers that have a bona fide medical, economic, or social hardship and has worked in this case to ensure that customers are not exposed to additional harm. Allegheny Power's plans for EE&C and DR programs filed in this case will continue to track customers with physical ailments and hardships. Naturally, I believe that if the Commission requests or requires Allegheny Power to develop further reasonable mechanisms for identification of hardship customers and is willing to allow Allegheny Power to recover any new costs for mitigating any hardship related concerns Allegheny Power would be open to discussion of those issues.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

III. APPENDIX A – RESUME

Ethan L. Cohen

Mr. Cohen:

- is a recognized utility-IT and utility industry consultant with extensive IT, environment, sustainability, Smart Grid, Smart Metering, and business management related project experience.
- is hired by utilities and energy companies to provide strategy, advisory, and management consulting.
- is hired by utilities and energy companies to perform research studies on various activities within the utility and energy industry. Most recently, Mr. Cohen has lead studies on Advanced Metering Infrastructure and Demand Response programs and technologies.

Summary of Qualifications

Seasoned consultant and business executive with more than twelve years of management experience providing solutions to utilities, energy companies, technology vendors and government agencies. A solid track record of project and thought leadership in the energy and utilities sector. Success has been based on a career-long focus on strategic, financial and technological aspects of electric, gas, and water utility business processes. Repeatedly selected by clients and employers for innovation in launches of new businesses and the management of complex business change initiatives. Published and quoted extensively in industry journals, contributor to major research efforts for the Federal Energy Regulatory Commission and a leader in process improvement for clients and colleagues worldwide.

Expertise

EXPERTISE		
Business Strategy & Finance	Technology Assessment	Process modeling
Operations Strategy	Aging workforce renewal	Benchmarking
Technology Assessment	Business process improvement	Systems selection
M&A due diligence	Emerging energy/CleanTech	Product development

Relevant Project Experience

EDS, PLANO, TEXAS 12/08 TO PRESENT	
Role	Senior Manager, Utility Industry Consulting & Solutioning
Responsibilities	Utility industry consulting and solutioning

UTILIPOINT INTERNATIONAL, ALBUQUERQUE, NEW MEXICO, 2003 TO 2009	
Role	Senior Director
Responsibilities	• Worked with company and utility executive management to formulate thought leadership papers, consulting methodologies, and go-to-market strategies for SmartGrid technologies and services.
Projects	• Launched and managed company meter-to-cash, advanced metering and SmartGrid practices including subscription research and weekly advisory service to utilities, energy companies, technology vendors and industry regulators. Practices have produced more than $3.8 million in research revenue. • Evaluated existing environmental, technical, and structural barriers to practice launches; worked with a variety of internal and external parties to clear roadblocks and move products/services to launch. • Established and documented formal marketing and distribution processes. • Served as marketer and business development executive for research products including whitepapers and industry updates and professional services including management consulting and benchmarking. • Performed weekly, monthly, and special analyses of utility markets in support of clients and research papers. • Increased company revenues by 335% in a 12-month period by introducing new capabilities to in the areas of multi-client survey surveys, and utility technology selection consulting • Developed marketable solutions for consulting practices focused on process improvement, benchmarking, outsourcing, asset management and authored regular column articles for companies industry recognized IssueAlert publication • Performed a utility back-office prudence audit on a major state utility at the request of the Public Utilities Commission of Ohio (PUCO). All audit findings and expert testimony before the PUCO accepted in full without rebuttal. • Performed due diligence for a large Canadian utility acquiring the deregulated retail company of a competitor. The work included a review of the retail systems used to enroll and bill end-use customers and resulted in a report detailing what the acquirer was buying and its longevity/viability in the Ontario provincial market. • Led a team developing strategic plan for outsourcing billing,

	customer care and customer service for a multi-regional U.S. gas and electric utility client. Plan was accepted by board and fully implemented improving costs and performance. • Led an evaluation project for a large Canadian Maritime utility ultimately recommending the deployment of asset management and work management technologies leading to process improvements to enhancing the accuracy, cost-effectiveness, and value of work details to the utility. Recommendations made by project team were planned for implementation in full by the utility. • Developed strategic outsourcing plan, oversaw strategic multi-year business process outsourcing transformation and implementation project with a Tier 1 utility meter-to-cash outsourcing provider for a large Western regional gas utility. • Consulted with service providers to the electric industry on market entry plans into the U.S. and European electricity industries. The efforts included a market and business plan for each client respectively. • Developed strategic platform for evaluation and management of large, complex, collaborative utility business efforts focusing multiple parties on a common end state for business process outsourcing and prepared industry recognized Technology Vendor Analysis Matrix and STAR Analysis spreadsheet-based tools for evaluation of various utility technology and software systems.
ECCO CONSULTING, BOSTON, MASSACHUSETTS, 2001 TO 2009	
Role	Principal
Responsibilities	Management consulting specializing in business strategy and business process optimization.
Projects	• Completed valuation tasks for a variety of projects, including calculation of the current value of a long-term power purchase contract for an Native American owned casino and determining risk exposure if unilateral break-off of that contract were pursued, quantification of a merger target's potential environmental liabilities, and creation of value management strategies to optimize the mix of businesses in a diversified portfolio. • Executed merger and acquisition project work including quantification of the financial impacts of proposed mergers, identification of performance gains and cost savings achievable from merger synergies, and evaluation of the most effective level of M&A activity for a growth-oriented energy trading and risk management firm.

	• Created new marketing strategy and market positioning approach for a leading Electronic Bill Presentment and Automated Payments vendor serving utilities, telecommunications companies and banks. Approach yielded client $3 million in additional business within three months of implementation.
BLUE RIDGE PARTNERS, MCLEAN VIRGINIA, 2002-2003	
Role	Manager
Responsibilities	Management consulting and strategic investment banking that assists large corporations identify under-leveraged assets and optimize their value through asset sales, spin-offs, joint ventures, in-sourcing and outsourcing.
Projects	• Managed a large multi-phase project management office for a major East Coast utility divesting a competitive energy services provider business. Business was sold for a multiple of eight times earnings valuation. • Oversaw improvement project focused on ACH check conversion and NACHA compliance for 4th largest U.S. bank. Project saved the bank more than $180 million in revenue erosion over a two year period. • Performed quantitative business assessments for fuel cell and engine-derivative modular power plant designs and their impact on U.S distributed generation for a major East Coast utility. • Provided strategic counsel for meter-to-cash business process outsourcing project for a major Mid-Atlantic utility. • Assisted utility industry technology clients in formulating and answering strategic business development questions, make difficult decisions about technology and business process outsourcing and refine business and technology processes.
ABERDEEN GROUP, BOSTON MASSACHUSETTS, 2000-2002	
Role	Research Director
Responsibilities	Computer, communications and energy consulting and market research related to IT, corporate finance, M&A, corporate and technology positioning.
Projects	• Managed Practice P&L, building business to $2.2 million in total recurring annual revenue. • Launched Energy and Communications practice receiving business from more than 30 technology vendors. • Directed a project focused on development of a strategy and roadmap to improve the financial, operational, and managerial

	results of the transmission and distribution divisions through improvements in asset management and finance functions for a large Southern utility. Project activities identified significant weaknesses in the utility's ability to implement changes needed to make necessary improvements under its current processes. This played a direct role in the utility's decision to establish a multi-year project management office to oversee transmission and distribution, business process, and engineering improvement efforts; client savings from all initiatives were $11M/year for 9 years. • Created business case and operations model for United States 2nd largest utility combining a telecom subsidiary and an unregulated energy service company resulting in $93 million in operational savings. • Developed business plan for leading national energy retailer resulting in creation of $300 million in asset valuation. • Led evaluation of the impact of regulatory response to financial considerations of business actions under consideration for a large ten-state electric and gas utility, such as the regulatory adequacy of financial and operational assumptions made in the extension of a long-distance power transmission and distribution project processes and the impact of potential regulatory and intervener concerns on business cases for transmission asset divestitures and purchases. • Authored a fully accepted and implemented feasibility study for a new merchant transmission line in the Northeastern U.S. for a large gas and electric company. Feasibility study was accepted by three state regulatory review panel and transmission was built according to study's specification. • Developed a model for a U.S. utility that allowed management to quantitatively evaluate and compare different transmission asset sale or transfer options and maximize long-run asset value. • Provided strategic counsel to leading computer technology companies on business plan development, product development, marketing and positioning and capital acquisition.
THE YANKEE GROUP, BOSTON, MASSACHUSETTS, 1999-2000	
Role	Senior Analyst
Responsibilities	Technology research and consulting in the areas crucial to society: energy, communications, and computing.
Projects	• Evaluated existing business processes and organizational

structures in work management, maintenance activity analysis, and fleet management for a large public electric utility, and developed recommendations and business cases for changes that would lower ongoing costs and improve overall effectiveness in these areas.

- Developed a value-based generation asset management strategy for the largest West Coast electric and gas utility, including specification of activities, responsibilities, expenditure forecast models, and required data. Strategy was accepted as written and implemented with estimated savings to the utility of $6 million per annum.
- Assessed the feasibility and risk profile of over thirty potential service offerings for a regulated utility interested in marketing certain new, unregulated services related to broadband over power line technology; developed market and revenue estimates for approximately half of them under a variety of scenarios.
- Created unique value propositions to help a variety of utility and energy technology clients differentiate their products and services to increase revenue, market share and awareness.

OTHER EXPERIENCE

- Cerulli Associates, Boston, Massachusetts Authored articles on the commercial banking industry for company publications and completed research on financial services industry intermediary advice distribution trends for large U.S. financial group.
- Harvard School of Public Health, Boston, Massachusetts Performed quantitative epidemiology and public policy research.
- United States Senate, Office of United States Senator William S. Cohen, Washington, D.C. Researched and prepared briefs on distributed generation and renewable energy technologies, assisted in the creation of a plan for environmentally responsible energy development, handled constituent affair assignments and researched Congressional Inquiries.
- Bangor Hydro Electric Company, Bangor, Maine Supervised writing and compilation of the company's compliance reports for OSHA; and participated in strategy and deregulation planning for Maine PUC outreach.

PROFESSIONAL SPEAKING, ARTICLES AND MEDIA

- Speaking Engagements - Delivered presentations and participated in panels at high-level industry conferences, including: SchlumbergerSema Client Conference, SAP and Oracle User Group Meeting, Insight Venture Partners Annual Conference and

	Meeting, GE-GXS User Group Annual, PowerMart, and DistribuTech, CS Week and many others. • Contributed Articles & Media - Regular contributor of bylined articles to key energy, technology and business publications; frequently quoted in energy-related articles in: The Wall Street Journal, The New York Times, The Boston Globe, Investor Business Daily, Public Utilities Fortnightly, New Energy Economy, Energy IT, The Boston Business Journal, Red Herring, Business Week and Financial Advisor Magazine, UtiliPoint International IssueAlert and others. Appeared on air as an industry analyst and subject matter expert on CNBC, TechTV, and ABC News, National Public Radio and WGBH Boston.

EDUCATION

M.B.A , Boston University School of Management, Boston, Massachusetts, 2009

Coursework for Doctoral Degree in Comparative History, Brandeis University, Waltham Massachusetts, 1998

M.A., Comparative History, Brandeis University, Waltham, Massachusetts, 1997

A.B., Political Science, Correlate History, Honoris Materia Subjecta, Vassar College, Poughkeepsie, New York, 1996