BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of West Penn Power Company	:	
d/b/a Allegheny Power For Expedited	:	DOCKET NO. M-2009-2123951
Approval of its Smart Meter Technology	:	
Procurement and Installation Plan	:	

DIRECT TESTIMONY

of

J. RICHARD HORNBY

On behalf of:

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

October 16, 2009

DIRECT TESTIMONY OF J. RICHARD HORNBY

TABLE OF CONTENTS

LIST OF EXHIBITS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, EMPLOYER, AND PRESENT POSITION.

A. My name is James Richard Hornby. I am a Senior Consultant at Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, MA 02139.

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

A. I am testifying on behalf of the Pennsylvania Office of Consumer Advocate (OCA).

Q. PLEASE DESCRIBE SYNAPSE ENERGY ECONOMICS.

A. Synapse Energy Economics (Synapse) is a research and consulting firm specializing in energy and environmental issues, including: electric generation, transmission and distribution system reliability, market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Q. PLEASE SUMMARIZE YOUR WORK EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I am a consultant specializing in planning, market structure, ratemaking, and gas supply/fuel procurement in the electric and gas industries. Over the past twenty years, I have presented expert testimony and provided litigation support on these issues in approximately 100 proceedings in over thirty jurisdictions in the United States and Canada. Over this period, my clients have included staff of public utility commissions, state energy offices, consumer advocate offices and marketers.

Prior to joining Synapse in 2006, I was a Principal with CRA International and, prior to that, Tabors Caramanis & Associates. From 1986 to 1998, I worked with the Tellus Institute (formerly Energy Systems Research Group), initially as Manager of the Natural Gas Program and subsequently as Director of their Energy Group. Prior to 1986, I was Assistant Deputy Minister of Energy for the Province of Nova Scotia.

I have a Master of Science in Energy Technology and Policy from the Massachusetts Institute of Technology (MIT) and a Bachelor of Industrial Engineering from the Technical University of Nova Scotia, now merged with Dalhousie University. I have attached my resume to this testimony as Exhibit___(JRH-1).

Q. PLEASE SUMMARIZE YOUR EXPERIENCE WITH THE ECONOMICS OF, AND RATEMAKING FOR, ENERGY EFFICIENCY AND DEMAND RESPONSE, INCLUDING DEMAND RESPONSE ENABLED BY ADVANCED METERING INFRASTRUCTURE (AMI) SUCH AS THE SMART METERING INFRASTRUCTURE PROPOSED BY ALLEGHENY POWER.

A. My experience with energy efficiency measures and policies began over thirty years ago as a project engineer responsible for identifying and pursuing opportunities to reduce energy use in a factory in Nova Scotia. Subsequently, in my graduate program at MIT, I took several courses on energy technologies and policies, and prepared a thesis analyzing federal policies to promote investments in energy efficiency. After MIT, I spent several years with the government in Nova Scotia, during which time I administered a provincial program to promote energy conservation in the industrial sector and later included energy conservation in all sectors as part of energy plans developed for the province.

Since 1986, as a regulatory consultant I have helped review and prepare numerous integrated resource plans in the gas and electric industries, and testified regarding cost allocation and rate design. During the past several years I have led projects to estimate the avoided costs of electricity and natural gas in New England for a coalition of efficiency program administrators. In addition I have reviewed the economics of demand response, and of AMI proposals in New Jersey, Maine, the District of Columbia and Pennsylvania. I have testified regarding the alignment of utility financial incentives and

rates with the pursuit of energy efficiency in proceedings in North Carolina, South Carolina, Indiana and Minnesota.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. West Penn Power Company d/b/a Allegheny Power (Allegheny Power or the Company) filed a petition dated August 14, 2009 requesting approval of the Smart Meter Technology Procurement and Installation Plan (SMIP or Smart Meter Plan) attached to its petition and to approve the initial phase of its SMIP activities and expenditures in 2009. (In my testimony I will also refer to the Company's proposed smart meter technology as AMI). Subsequently, on August 28, the Company filed Direct Testimony of five witnesses in support of its petition. In his Direct Testimony, Allegheny Power witness Heasley provides an overview of the application. Allegheny Power witness Ahr describes the SMIP, its timetable and cost-effectiveness. Allegheny Power witness Arthur discusses the SMIP technology. Allegheny Power witness Valdes describes the SMIP costs, the Company's proposed allocation of those costs and the tariff proposed to recover those costs. Allegheny Power witness Cohen describes the relationship between the SMIP and the Demand Response programs and rates the Company proposed in the Energy Efficiency and Conservation Plan dated June 30, 2009 that it filed in Docket M-2009-2093218.

The OCA has retained two witnesses to address the Company's requests from the perspective of residential customers, myself and Ms. Nancy BrockWay. My testimony addresses the policy and ratemaking implications of the Company's requests, the level of projected benefits of its Smart Meter Plan relative to its projected costs, as well as the uncertainty associated with those benefits, and the allocation and rate design issues underlying its proposed cost recovery. (The fact that I do not address other aspects of the

Company's filing should not be interpreted to mean I agree with those aspects.) Ms. Brockway addresses certain other aspects of Allegheny Power's Plan for expedited full deployment of smart meters.

Q. **WHAT DATA SOURCES DID YOU RELY UPON TO PREPARE YOUR TESTIMONY AND EXHIBITS?**

A: I relied primarily on the Direct Testimony, exhibits, and workpapers of the Company witnesses. I also relied upon Company responses to various data requests. In addition, I relied upon analyses of the PJM wholesale market for capacity and various reports on AMI and dynamic pricing[1].

II. CONCLUSIONS AND RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSION AND RECOMMENDATION REGARDING ALLEGHENY POWER'S PROPOSED SMART METER PLAN.

A. My primary conclusion is that result the Company's proposed Smart Meter Plan is not reasonable. The Company has not demonstrated that its proposed Plan is the most cost-effective approach of meeting the goals of Pennsylvania Act 129 with respect to deploying smart meter technology and supporting reductions in peak load and annual energy consumption.

The projected cost of the Company's proposed Smart Meter Plan, on a net present value (NPV) basis, is about six times higher than its projected savings in distribution

[1] The difference between dynamic pricing and traditional time-of-use (TOU) pricing is the manner in which the specific pricing periods are set. Under TOU the pricing periods are static, they are set in a rate case and remain unchanged between rate cases. For example, a TOU approach might set different prices for a summer peak period, a summer off-peak period and a non-summer period. In contrast, under dynamic pricing a utility would determine the time periods during which its Critical Peak Time (CPT) and/or Critical Peak Pricing (CPP) would apply on a "dynamic" basis, according to anticipated changes in system conditions from day to day during the summer. For example, it might notify customers approximately 18 hours in advance of an impending critical peak period during which its CPT and/or CPP would apply.

service and generation service costs, for a benefit to cost ratio of less than 0.2. Its projected capital costs are more than twice as high as AMI projects of other utilities, primarily due to higher costs for Information Technology (IT) integration and software as well costs for in-home devices (IHDs) and a Customer Information System (CIS). Allegheny Power is proposing $100 million, or twenty percent of the total capital cost of the Plan, for IHDs. These are primarily in-home displays it is proposing for every residential premise plus in-home load control devices and remote control devices on each meter. Allegheny Power has included costs for modernizing its Customer Information System (CIS) which is an investment it should make as part of its normal course of business.

My second conclusion is that there is uncertainty associated with certain of the projected benefits and projected costs due to the lack of experience with the full-scale deployment of AMI and dynamic pricing such as the approach that Allegheny Power is proposing. Those uncertainties create a financial risk that the actual benefits from the Smart Meter Plan may prove to be even less than the Company's projections. This financial risk is relevant to the Commission's decision regarding approval of the Company's request as well as to its decision regarding cost recovery.

Based upon those two conclusions, I recommend that the Commission not approve the Company's proposed Smart Meter Plan as filed. Instead, I recommend that the Commission require the Company to:

- file a modified Plan limited to activities and analyses it would complete during the remainder of the 30-month grace period allowed under Act 129 and the Smart Meter Plan Implementation Order. Consistent with the comments filed by the OCA on September 25, 2009, the modified Plan should include specific

milestones and a commitment by Allegheny Power to report to the Commission when each milestone is achieved, at which time the Commission could review and approve decisions and the next tasks;

- remove costs for modernizing its CIS from the SMIP;
- drop its proposal to install an in-home display in every premise and provide a benefit-cost analysis to justify deployment of each type of in-home device;
- provide a justification for the proposed level of expenditures on IT integration and software; and
- use the remainder of the 30-month grace period grace period to revise and refine its proposed approach in order to identify the most cost-effective smart meter technology deployment strategy and to quantify both the generation service and distribution service benefits of that strategy over a fifteen year period.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS REGARDING ALLEGHENY POWER'S PROPOSALS FOR RECOVERING THE COSTS OF THE SMART METER PLAN FROM RATEPAYERS AS WELL AS FOR CREDITING BENEFITS TO RATEPAYERS.

A. The Company proposes to recover the projected five year nominal cost of $580 million of its Smart Meter Plan from all rate classes through a new Smart Meter Technology ('SMT') Surcharge that would operate independent of base rates. The proposed SMT is expressed in $ per meter per month, i.e. it would be an unavoidable monthly fixed charge.

The Company proposes to flow the projected distribution service benefits of the Smart Meter Plan to ratepayers through the SMT. It expects that the energy supply cost benefits from the SMIP will flow directly to those ratepayers who reduce peak load in response to the Company's proposed Demand Response programs and rate offerings and

indirectly to all ratepayers in the form of lower generation service costs due to the impacts of reductions in peak load wholesale capacity and energy prices.

The cost recovery aspects of the Company's proposed Smart Meter Plan include the level of annual revenue requirements to be recovered, the allocation of those revenue requirements among rate classes and the design of the specific rates by rate class to recover those allocated revenue requirements.

The level of revenue requirements the Company is proposing are based upon a Plan that is not reasonable. In addition they reflect a rate of return based on a return on equity that is out of date, asset lives that are too short and recovery of $24 million in stranded investment.

The Company's allocation and rate design proposals are not guided by either a cost-of-service (COS) study or an analysis of bill impacts. The absence of these analyses is of particular concern since the Company's proposed SMT will increase customer charges of residential customers by a significant amount, which in turn will lead to significant increases in the bills of low usage residential customers. The Company should have prepared a COS to guide its proposed allocation of the Smart Meter Plan's revenue requirements among rate classes. In addition, it should have used the results of that COS study and an analysis of bill impacts to determine the portions of the revenue requirements allocated to residential customers that should be recovered as surcharges on the monthly customer charge and delivery charge components of tariffs respectively.

Based upon that conclusion, I recommend that the Commission require the Company to set its level of revenue requirements to recover only those Plan costs that the Commission determines are reasonable. When setting those revenue requirements the Company should be required to use a rate of return reflecting a return on equity

consistent with current conditions and asset lives of fifteen years for smart meters. Recovery of any stranded investment should be deferred to the next base rate case. In terms of allocation and rate design, the Company should be required to present the results of a COS study and an analysis of bill impacts before it is allowed to recover any costs from residential customers via a fixed monthly surcharge.

III. POLICY AND RATEMAKING IMPLICATIONS OF COMPANY REQUESTS

Q. PLEASE SUMMARIZE THE COMPANY'S SMART METER PLAN.

A. The Company is proposing to deploy an AMI, or smart meter technology system, throughout its service territory over a five year period, 2010 through 2014. In addition it is proposing to install three types of in-home devices (IHDs), i.e., in-home displays in every residential premise, devices to enable remote connection/disconnection and load control devices. Finally, it is proposing to modernize its CIS. Allegheny Power estimates that the total cost for its Plan will be $580 million (Valdes Direct, page 4).

The Company states that the Smart Meter Plan will enable nine of the programs/rate offerings proposed in its EE&C and DR filing of June 30, 2009 in Docket. M-2009-2093218. The four DR programs are programmable controllable thermostat, customer load response, contracted demand response and distributed generation. The five DR rate offerings are residential efficiency rewards rate, pay ahead service rate, critical peak rebate, time of use with critical peak pricing, and hourly pricing. The primary goal of these programs and rates is to encourage customers to reduce their electricity use during peak hours, although the distributed generation program and the residential efficiency rewards rate also will encourage less use of system electricity in other hours.

The Company estimates that the Plan will start producing $9.44 million per year in annual benefits in the form of generation savings in its distribution service costs starting in 2015 (OCA I-8). The Company has not projected the value of savings in electricity supply costs that customers might achieve from participating in either the programs or rate offerings enabled by its SMIP. Based upon its projections of costs and benefits the Company estimates that the Plan will result in a net cost to customers of over $400 million (NPV) during its first five years.

Q. DO OTHER UTILITIES HAVE LONG-TERM EXPERIENCE WITH THE PERFORMANCE AND ECONOMICS OF AMI AND DYNAMIC PRICING ON A SYSTEM-WIDE OR FULLY DEPLOYED BASIS?

A. No. Utilities have conducted a number of pilot projects testing AMI and dynamic pricing on a limited basis. However, it is only in the last few years that several United States utilities have received regulatory approval to deploy AMI and dynamic pricing tariffs on their systems on a wide scale basis. In fact, most of those utilities are currently in the process of completing that deployment.

The absence of robust empirical evidence regarding the performance and economics of AMI and dynamic pricing on a system-wide basis over time results in considerable uncertainty regarding both long-term technical performance and the magnitude of peak load reductions that will actually be sustained in the long-term in response to dynamic pricing approaches such as PTR or CPP. In an effort to help reduce that uncertainty, and help stimulate the economy, the recent federal stimulus bill, i.e., the American Recovery and Reinvestment Act of 2009, H.R. 1, 11th Congress (2009) (ARRA) approved appropriations to fund Smart Grid Demonstration Projects as well as a

Smart Grid Investment Matching Fund to help support deployment of AMI by utilities who meet the grant selection criteria.

Q. WHAT IS ALLEGHENY POWER'S OBLIGATION WITH RESPECT TO IMPLEMENTING FULL DEPLOYMENT OF AMI AND/OR DYNAMIC PRICING UNDER ACT 129?

A. From a policy perspective, my understanding is that Act 129 establishes important energy and environmental goals for Pennsylvania, including targets for reductions in annual energy consumption and for reductions in peak load. The Act also requires electric distribution companies (EDCs) such as Allegheny Power to deploy smart meter technology. Thus, the Act establishes general policy goals but leaves the details of the strategies for achieving those goals to be developed under the regulatory oversight of the Commission.

This approach is consistent with sound public and ratemaking policy. First, there are many different possible approaches to deploying a Smart Meter Plan. Second, Pennsylvania utilities provide electricity to service territories that differ widely in terms of key attributes such as the composition of their customer base, the costs of distribution service, the costs of generation service and the opportunities for reducing those costs through efficiency and demand response. Therefore, it is not surprising that Act 129 has placed the onus on each utility to develop a Smart Meter Plan in a manner that is most cost-effective for its specific service territory.

Under this approach Allegheny Power and every other EDC has to demonstrate to the Commission that its proposed Smart Meter Plan is the most cost-effective approach for its specific service territory. In other words, I believe that Allegheny Power must demonstrate to the Commission that its proposed Smart Meter Plan is the most cost-effective approach for meeting the policy objectives of Act 129 out of the range of

possible alternative approaches available to it. Thus, from a policy perspective there is nothing in Act 129 which exempts the Company from bearing the burden of demonstrating to the Pennsylvania Public Utility Commission (PUC) that its specific proposal will satisfy the statutory obligation to provide service at just and reasonable rates.

Q. HAS THE NATIONAL ASSOCIATION OF REGULATORY COMMISSIONERS (NARUC) EXPRESSED CONCERNS REGARDING THE POTENTIAL FOR ADVERSE RATE AND BILL IMPACTS FROM TOO RAPID OF A TRANSITION TO FULL DEPLOYMENT OF AMI?

A Yes. In his March 3, 2009 testimony to the United States Senate Committee on Energy and Natural Resources, New Jersey Commissioner Frederick Butler, President of NARUC, expressed a number of concerns regarding a rapid move to full deployment of Smart Grid systems. In that testimony, attached as Exhibit__(JRH-2). President Butler makes a number of important points regarding consideration of ratepayer reaction:

> *I know the Smart Grid can change how utilities oversee their networks and improve reliability. I know that, in the end, consumers could have greater control over their usage and have the potential to lower their bills. I also know, however, that if we do not do this correctly, if we move too quickly and promise too much we can endanger our coming close to meeting any of those lofty aspirations.*
>
> *But we do need to be careful. Right now, we are selling the Smart Grid as a means of empowering consumers to lower their usage and, correspondingly, their energy bills. While this may ultimately be the case, we must learn our lesson from*

the restructuring experience before heading down this path. The promise of restructuring was that consumers would save money by shopping for power….

The problem here was not restructuring per se, but it was the way it was sold to consumers. Instead of determining the best way to move forward deliberatively, we jumped right in, with the promise of lower rates to follow. Because of this approach, and because of the results, the concept of restructuring has taken a significant hit.

The concern that many of my colleagues are trying to resolve is that consumers are convinced that the Smart Grid will only raise their rates with no discernable benefits. In a high-priced environment, some or perhaps most consumers see advanced metering rollouts as just one more headache and budget buster and are particularly scared that utilities and vendors will keep raising rates as the technology changes.

We have to remember that the Smart Grid will only achieve its vast potential if consumers embrace it.

Even if there were no uncertainty associated with the projected benefits of the Smart Grid, Commissioner Butler's comments indicate that it is essential to consider the impacts on ratepayers when assessing proposals for full deployment. Moreover, since there are uncertainties regarding the projected benefits of AMI and dynamic proposals such as Allegheny Power's proposed Smart Meter Plan, a rigorous assessment is even more critical.

Q. ARE THERE OTHER REASONS WHY UTILITIES SHOULD MAKE A GRADUAL TRANSITION TO FULL DEPLOYMENT OF AMI AND DYNAMIC PRICING?

A. Yes. There are several reasons why Pennsylvania utilities such as Allegheny Power should make a gradual transition to full deployment of AMI and dynamic pricing.

First, the installation of AMI and associated enabling of dynamic pricing, in and of themselves, do not reduce customer electricity use during peak hours or annually. Instead, actual reductions in peak load and annual consumption, and hence in annual electricity bills and environmental impacts associated with that physical consumption, will only be achieved if individual customers actually reduce their electricity consumption in response to dynamic prices in every period, year after year. As discussed in Ms. BrockWay's testimony, there is still substantial uncertainty and the need for consumer education regarding residential customer responsiveness to dynamic pricing and price information in the long-term.

Second, deployment of AMI and dynamic pricing such as the Company's proposed Smart Meter Plan primarily enable reductions in peak load rather than reductions in annual electricity consumption. Reductions in peak load are referred to as demand response (DR) while reductions in annual electricity consumption are referred to as energy conservation or energy efficiency (EE). DR alone has only limited impacts on annual energy consumption and the annual environmental impacts associated with the generation of electricity to supply that annual consumption. Reductions in critical peak hours are important because they have a much higher economic value than reductions in other hours of the year. The high economic value is due to the ability of reductions in those hours to reduce capacity costs in addition to the high price energy in critical peak

hours. However, significant new reductions in peak load can be achieved from commercial and industrial (C&I) customers without any deployment of AMI because they already have the necessary interval meters and communication technology. Moreover, reductions in critical peak hours represent a relatively small portion of customer annual usage. EE measures, in contrast, not only lead to reductions in electricity consumption during critical peak hours, like DR, but also in all the other hours when electricity affected by that measure is being used.

Third, the timing and magnitude of the capacity costs avoided due to DR can be more difficult to estimate than the timing and magnitude of the electric energy costs avoided due to EE. For example, a 1 kWh reduction in electricity consumption from energy conservation or EE results in a corresponding immediate reduction in the quantity of electricity generated, after adjustments for system losses. That quantity of electricity generation is clearly avoided. In contrast, a 1 kW reduction in peak load from DR does not automatically produce a corresponding immediate reduction in the quantity of capacity being held to ensure reliable service for that load. Instead, decisions regarding the quantity of generation, transmission and distribution capacity needed for reliable service are made several years before the year in which the actual load occurs. Thus, to avoid capacity, it must be assured that the reduction in peak load will continue over their long-term planning horizon. The fact that utilities and curtailment service providers have the ability to bid reductions in peak load into wholesale capacity markets in PJM and elsewhere has helped to reduce the uncertainty associated with projections of avoided wholesale generation capacity costs.

IV. COST EFFECTIVENESS OF PROPOSED SMIP

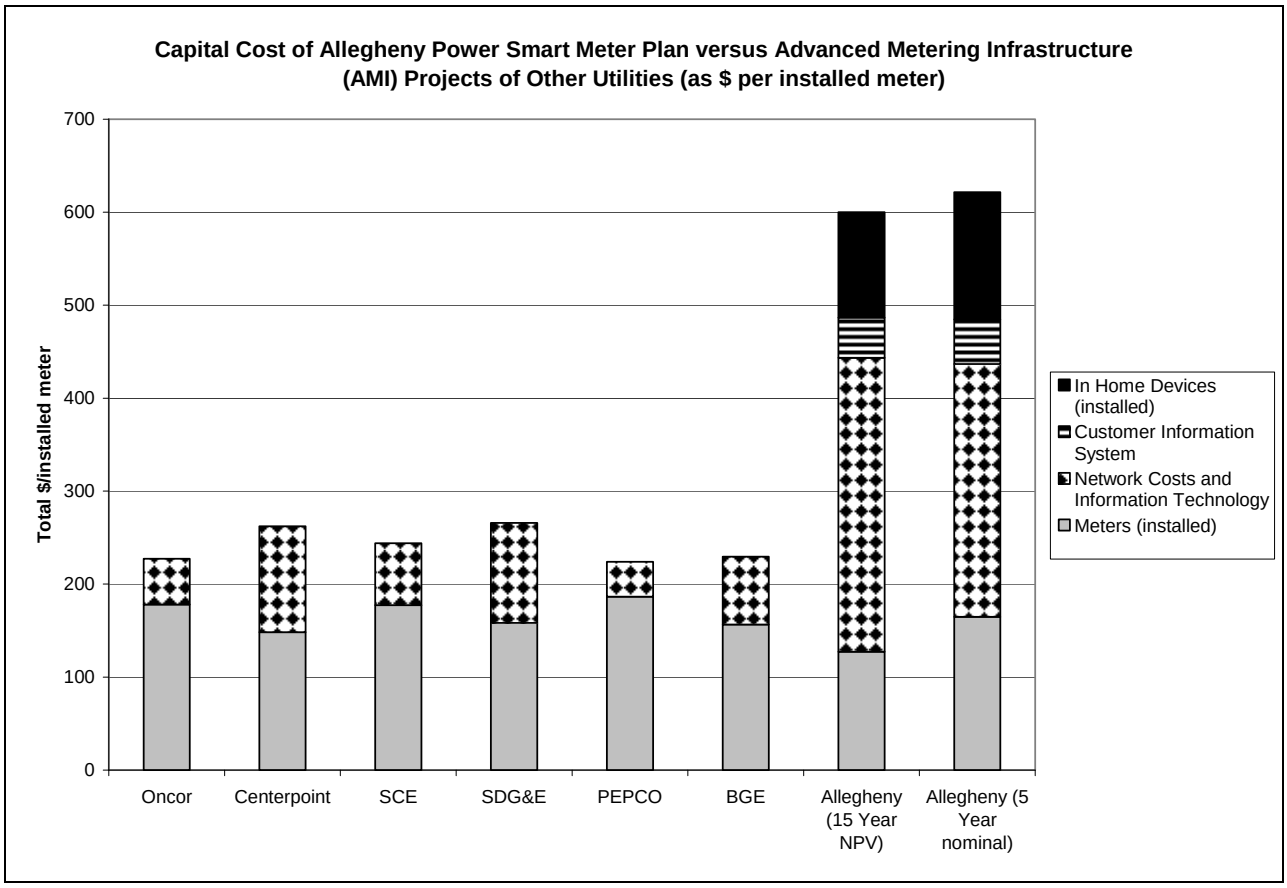
Q. PLEASE SUMMARIZE THE COMPANY'S CASE FOR ITS PROPOSED SMART METER PLAN.

A. Mr. Valdes summarizes the costs and benefits of the Company's proposed Smart Meter Plan in his Direct Testimony. The details of those costs and benefits for the first five years of the Plan are described in the SMIP dated August 14, 2009, and compared in Appendix C on page 129 of that filing. Additional details of those costs are presented in Appendices C and D of the filing.

Mr. Valdes estimates the projected nominal cost of the Smart Meter Plan to its Pennsylvania customers through 2014 will be $580 million. This amount consists of approximately $444 million in capital expenditures, $111 million in operation and maintenance ('O&M') expenses and $ 24.6 million in depreciation expenses for existing meters, also included as O&M.

Q. HOW DO THOSE COSTS COMPARE TO THE COSTS OF AMI SYSTEMS OF OTHER UTILITIES?

A. The projected capital costs of the Plan are more than twice as high as AMI filings of other utilities. As indicated in the chart below, attached as Exhibit___(JRH-3), the total capital cost of AMI systems of other utilities, when expressed as total capital invested per meter installed, tends to be around $250 per meter installed. In contrast, Allegheny Power's proposed capital costs are more than twice that amount, in the order of $600 per meter installed meter. The Company has not prepared such a comparison (OCA I- 40, II - 5).



The three components of the Company's capital costs that stand out relative to the capital costs of other filings are its Network and Information Technology (IT) costs, its IHD costs and its CIS costs. These are shown in the second, third, and fourth components of the two right-hand bars for Allegheny Power.

Q. PLEASE COMMENT ON THE PROJECTED COSTS OF IN-HOME DEVICES.

A. Allegheny Power is proposing $100 million, or twenty percent of the total capital cost of the Plan, for IHDs. There are three types of devices, i.e., in-home displays, load control devices and devices for remote connection/disconnection. Of those three, most of the $100 million is for in-home displays which the Company is proposing for every residential premise.

Act 129 does not require IHDs to be included as part of the smart meter technology that is paid for by all ratepayers. The Company has not presented a cost

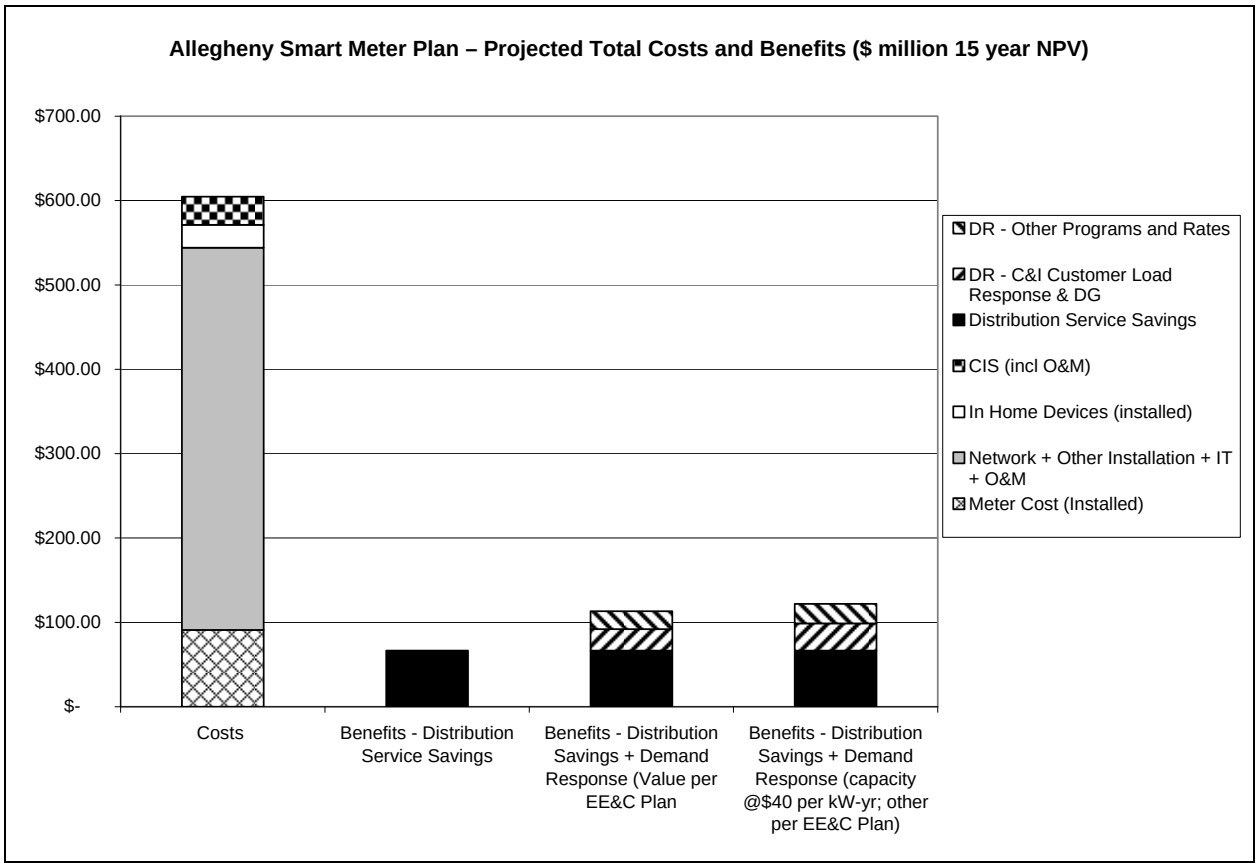
justification for that incremental expenditure (OCA I – 30, I- 32). Also it did not include the capital costs of IHDs in its comparison of benefits and costs in Appendix C of the SMIP filing.

Q. PLEASE COMMENT ON THE PROJECTED COSTS OF MODERNIZING THE CIS.

A. Allegheny Power has included costs for modernizing its CIS in this projection. This is an investment that one would expect Allegheny Power to make in its normal course of business (OCA IV –7). For example, Allegheny Power proposes to allocate approximately 52% of the total cost of the CIS system to its routine distribution service operations in Maryland and West Virginia. Allegheny Power indicates that it will seek to recover those costs in those states as part of its normal course of business (OCA III - 1).

Q. HOW DO THE PROJECTED BENEFITS OF THE SMART METER PLAN COMPARE TO ITS PROJECTED COSTS?

A. The NPV of the total projected cost of the Company's proposed Smart Meter Plan over fifteen years is about six times higher than its projected savings in distribution service and generation service costs. In other words the Plan has a benefit to cost ratio of less than 0.2 as indicated in Exhibit___(JRH-4). In contrast, the AMI plans of which I am aware that have been approved, or that are seeking regulatory approval, have benefit to cost ratios in excess of 1.0.



The Company has only projected the distribution service benefits of its proposed plan. Those amount to an NPV of only $66 million over fifteen years according to the McKinsey benefit-cost model that the Company used. If one includes the capital costs of IHDs, those distribution savings benefits would only provide a benefit to cost ratio of 0.11.

In the absence of an estimate by the Company, I estimated the generation service benefits of the DR programs and rate offerings from the Company's EE&C filing that it says are enabled by the its proposed Plan. These projected benefits are the direct savings in costs of capacity, energy, ancillary services and transmission that the Company assumed in its EE&C filing for its nine DR programs and rate offerings. The EE&C filing only projected those reductions through 2014, so I projected their benefits if they continued at their 2014 levels of reductions through 2024. These direct generation

service benefits hinge upon the Company's assumptions regarding the number of customers who will participate in its programs and rate offerings as well as on its assumptions regarding the reductions in peak load per participating customer. There is an additional category of indirect benefits that I did not calculate, which is the mitigation of wholesale electric energy and capacity prices resulting from the peak load reductions

I prepared two estimates of these benefits. The first estimate simply escalates the total savings in 2012 at 2.23%, the growth rate the Company used in its analyses. The second estimate assumes a capacity value of $40 per kW-yr in the PJM market and escalates the non-capacity portion of savings in 2012 at 2.23%. (The non-capacity savings are in wholesale energy, ancillary service and transmission and distribution costs). The value of $40 per kW-year is a high level estimate for the PJM market zone within which the Company operates.

The NPV values of those DR benefits are $46 million and $55 million respectively. When added to the distribution service benefits, they increase the benefit to cost ratio to approximately 0.2.

Q. PLEASE EXPLAIN HOW THE LEVEL OF BENEFITS RELATIVE TO COSTS RELATES TO THE MERITS OF THE COMPANY'S PROPOSED PLAN.

A. The level of benefits relative to costs is one measure of the cost-effectiveness of the proposed Plan. As noted earlier, there are many different possible approaches to deploying a Smart Meter Plan. Allegheny Power must demonstrate to the Commission that its proposed Smart Meter Plan is the most cost-effective approach for meeting the policy objectives of Act 129 out of the range of possible alternative approaches available to it. At a benefit cost ratio of less than 0.2, the proposed Plan certainly is much less cost effective than the AMI plans of other utilities of which I am aware. Those other AMI

plans, which have either been approved or are seeking regulatory approval, have benefit to cost ratios in excess of 1.0 according to their proponents. In contrast, Allegheny Power seems to believe that it can simply rely upon the language of Act 129 as justification for its proposed Plan. (OCA I-1, 1-2, 1-3, 1-4, 2-7).

Q. ARE THE PROJECTED BENEFITS FROM THE COMPANYS PROPOSED DR PROGRAMS AND RATES UNCERTAIN?

A. Yes. The projected savings in generation service costs from the Company's proposed DR programs and rate offerings are uncertain for several reasons. First, the Company has not finalized the details of these programs, nor has it analyzed the likely participation from various segments of its residential rate class (OCA I -13, I -15, I -16, I -18, II – 19, II – 20, IV – 2, IV -3).

Second, these benefits hinge upon assumptions regarding the percentage of customers who will participate and the reductions of those participants. Ms. BrockWay discusses some of the uncertainty associated with that assumption in her Direct Testimony.

Third, these benefits hinge upon the value of avoided capacity, energy and other costs that participating customers will actually realize from their reductions in peak load and the price mitigation impacts of those reductions. There is considerable uncertainty around those savings for several reasons. Allegheny Power has not finalized its process for bidding peak reductions into PJM markets and the future value of avoided generation capacity is uncertain.

Q. ARE THE QUALITATIVE SOCIETAL AND CUSTOMER BENEFITS LISTED IN THE SMIP FILING ADEQUATE JUSTIFICATION FOR THE PLAN?

A. No. The Company filing describes several categories of societal and customer benefits expected from the Smart Meter Plan starting at page 104. However, the Company has not quantified any of those benefits (OCA I – 4, OCA II-7).

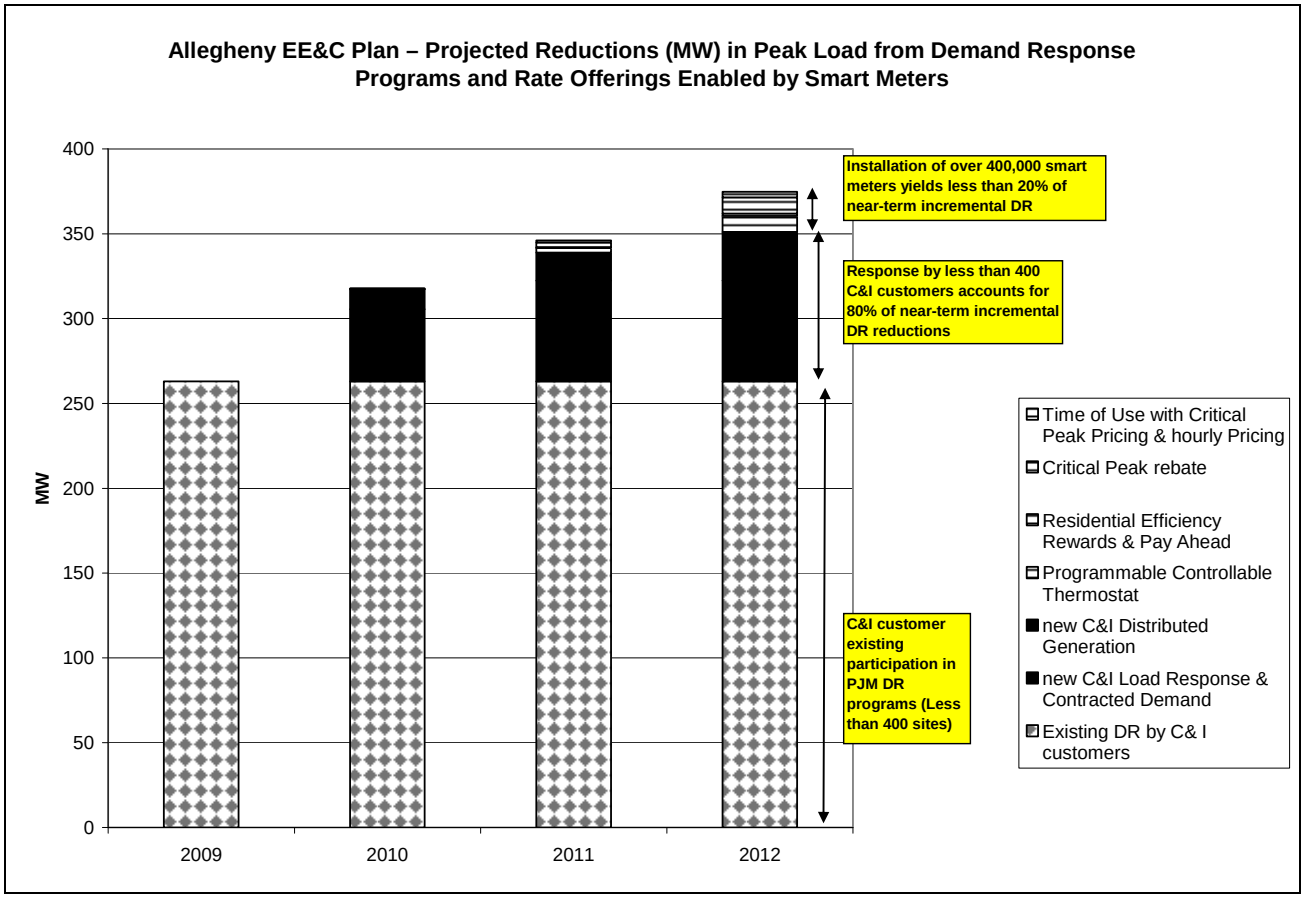
The qualitative benefits include avoided capacity and energy costs, which I have quantified. They also include environmental benefits such as reduced carbon emissions. The reference to these benefits implies that, if quantified, they would be material. However, until the Company actually quantifies each of these benefits in some manner, in physical terms if not in monetary terms, I recommend that the Commission not give them any weight.

The Company could have quantified the environmental benefits of the reductions in peak load and annual electricity consumption it is projecting, particularly reductions in physical quantities of carbon emissions. It is relatively straightforward to estimate the physical quantity of carbon reduced by applying a carbon emission co-efficient, e.g. tons of carbon per kWh, to the quantity of kWh reduced. The carbon emission coefficient can be estimated based on assumptions regarding the type and fuel of the generating units that are "on the margin" in peak and off-peak hours.

Q. COULD THE COMPANY MEET MOST, IF NOT ALL, OF ITS PROJECTED REDUCTIONS IN PEAK LOAD THROUGH 2014 WITHOUT IMMEDIATE FULL DEPLOYMENT OF AMI?

A. Yes. At the outset it is important to note that C&I customers in the Company's service territory are already participating in PJM DR programs, with an aggregate peak reduction of over 250 MW from less than 400 commercial and industrial ('C&I') customers. The

Company expects to achieve incremental reductions through the DR programs in its EE&C Plan. However, it expects to achieve 80 percent or more of those incremental reductions in peak load through 2012 from less than 400 (C&I) customers through two programs, customer load response and distributed generation. The dominance of reductions from those few C&I customers in those two programs is shown in the chart below, which is attached as Exhibit___(JRH-5).



In fact, the Company has the ability to obtain those incremental reductions from those C&I customers through those two programs without deploying any smart meters. As noted, C&I customers are already participating in DR programs using their existing interval meters and communication systems.

Allegheny Power is in fact proposing to install over 400,000 meters by 2012 to achieve a tiny, and uncertain, reduction in peak load. As an alternative, the Company could likely achieve its projected peak reductions with no near-term deployment of SMIP if it enlisted curtailment service providers to enroll more C&I reductions and if it began offering a direct load control program to its residential customers with central air conditioning. Electric utilities in New Jersey are achieving incremental reductions in peak load through both approaches.

Q. PLEASE SUMMARIZE YOUR CONCLUSION AND RECOMMENDATION REGARDING ALLEGHENY POWER'S PROPOSED SMART METER PLAN.

A. My primary conclusion is that the Company's proposed Smart Meter Plan is not reasonable. The Company has not demonstrated that its proposed Plan is the most cost-effective approach of meeting the goals of Pennsylvania Act 129 with respect to deploying smart meter technology and supporting reductions in peak load and annual energy consumption.

The projected cost of the Company's proposed Smart Meter Plan over 15 years, on a net present value (NPV) basis, is about six times higher than its projected savings in distribution service and generation service costs, for a benefit to cost ratio less than 0.2. Its projected capital costs are more than twice as high as AMI projects of other utilities, primarily due to higher costs for Information Technology (IT) integration and software as well costs for in-home devices (IHDs) and a Customer Information System (CIS). Allegheny Power is proposing $100 million, or twenty percent of the total capital cost of the Plan, for IHDs. These are primarily in-home displays it is proposing for every residential premise plus in-home load control devices and remote control devices on each meter. Allegheny Power has included costs for modernizing its Customer Information

System (CIS) which is an investment it would make as part of its normal course of business.

My second conclusion is that there is uncertainty associated with some of the projected benefits and projected costs due to the lack of long-term experience with the full-scale deployment of AMI and dynamic pricing such as the approach that Allegheny Power is proposing. Those uncertainties create a financial risk that actual benefits from the Smart Meter Plan may prove to be even less than the Company's projections. This financial risk is relevant to the Commission's decision regarding approval of the Company's request as well as to its decision regarding cost recovery.

Based upon those two conclusions I recommend that the Commission not approve the Company's proposed Smart Meter Plan as filed. Instead, I recommend that the Commission require the Company to:

- file a modified Plan limited to activities and analyses it would complete during the remainder of the 30-month grace period allowed under Act 129 and the Smart Meter Plan Implementation Order. Consistent with the comments filed by the OCA on September 25, 2009, the modified Plan should include specific milestones and a commitment by Allegheny Power to report to the Commission when each milestone is achieved, at which time the Commission could review and approve decisions and the next tasks;
- remove costs for modernizing its CIS from the SMIP;
- drop its proposal to install an in-home display in every premise and provide a benefit-cost analysis to justify deployment of each type of in-home device;
- provide a justification for the proposed level of expenditures on IT integration and software; and

- use the remainder of the 30-month grace period grace period to revise and refine its proposed approach in order to identify the most cost-effective smart meter technology deployment strategy and to quantify both the generation service and distribution service benefits of that strategy over a fifteen period.

V. RATEMAKING ISSUES ARISING FROM PROPOSED SMT SURCHARGE

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSAL FOR RECOVERING THE COSTS OF THE SMART METER PLAN FROM RATEPAYERS AS WELL AS FOR CREDITING BENEFITS TO RATEPAYERS.

A. The Company proposes to recover the Smart Meter Plan's entire projected cost of $580 million from all rate classes through a new SMT surcharge that would operate independent of base rates. The Company proposes to flow savings in its distribution service operating expenses to ratepayers through the SMT. It expects the generation service cost benefits will flow to ratepayers who participate in its DR programs and rate offerings

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSAL FOR RECOVERING THE COSTS OF THE SMART METER PLAN VIA ITS PROPOSED SMT.

A. The Company is proposing to recover the costs of its Smart Meter Plan outside of its regular base rates through the new SMT. It is proposing to begin recovering these costs in 2010.

The Company is proposing to apply the SMT as a customer charge, i.e. in $ per meter per month. As such, it would be an unavoidable monthly fixed charge. The SMT would apparently continue indefinitely. (OCA I-37, I-38).

In order to recover SMIP costs, the SMT would collect the annual revenue requirements associated with the Smart Meter Plan. The major components of these revenue requirements are depreciation and return on the un-depreciated amount each year. The SMT would also credit any savings in distribution service expenses that it achieves each year.

Q. IS THE COMPANY PROPOSING TO SUBJECT THE SMT TO A CAP?

A. No.

Q. DO THE VALUES THAT THE COMPANY HAS PROJECTED FOR THE SMT REFLECT ITS PROJECTED SAVINGS IN DISTRIBUTION SERVICE COSTS?

A. Yes. The values that the Company has projected for the SMT reflect its projected savings in distribution service costs. Thus, these are "net" surcharges.

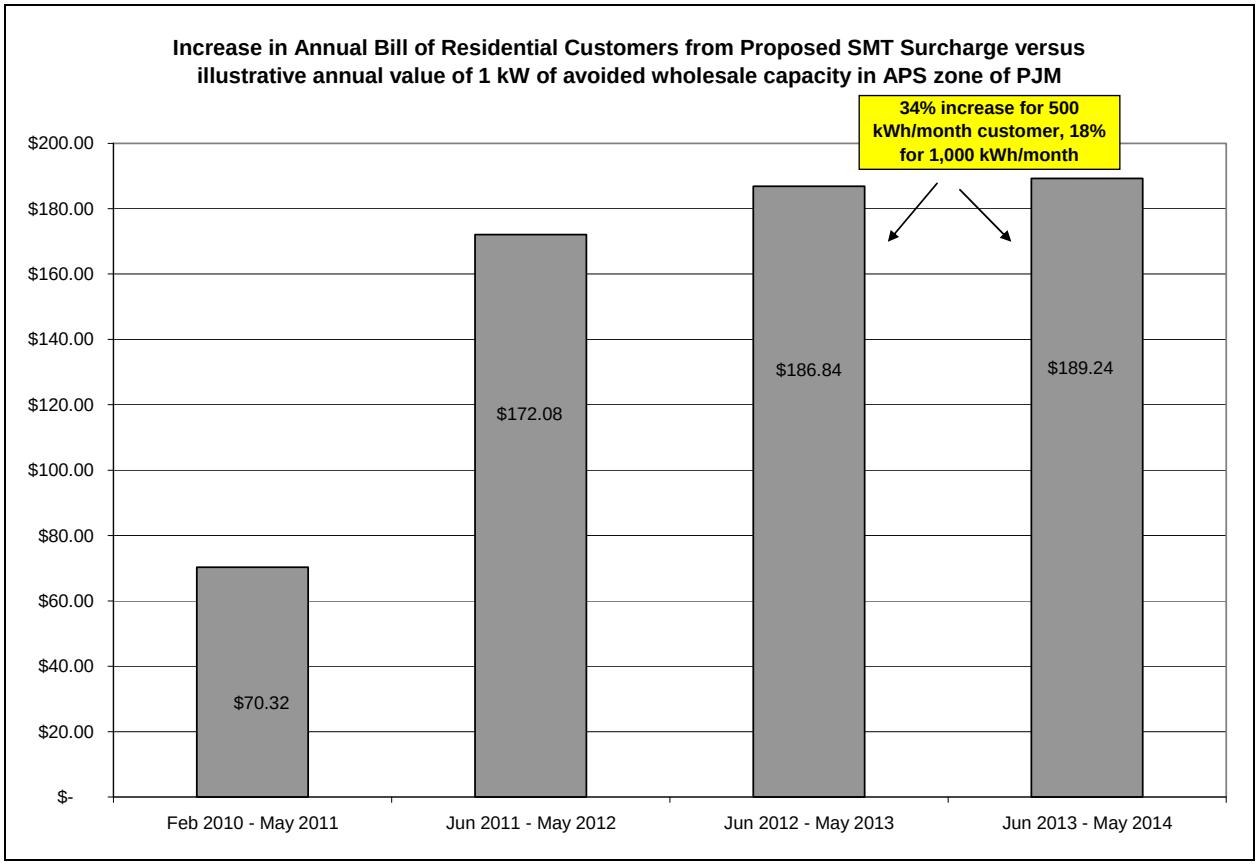
Q. WILL THE PROPOSED SMT INCREASE THE BILLS OF RESIDENTIAL CUSTOMERS?

A. Yes. The proposed SMT will increase the delivery service component of bills. Of course, the Smart Meter Plan does provide ratepayers the opportunity to offset some of those increases by reducing peak load in response to its DR programs and rate offerings.

The proposed SMT will increase the customer charges of residential electricity service substantially. Those increased customer charges will, in turn, produce particularly large percentage increases in the bills of low usage customers because the customer charge represents a significant portion of the bills of such customers.

The SMT for residential customers is projected to start at $5.86 per customer per month in 2010 and increase to $14.34 per month in June 2011, $15.57 per month in June 2012 and $15.77 per month in 2013. I illustrate the impacts of these increases on annual bills of residential customers using 500 kWh per month and 1,000 kWh per month in the

chart below, which is attached as Exhibit___(JRH-6). Starting in 2010, the SMT would increase the annual bill of a residential customer by approximately $70, a 12% increase for a customer using 500 kWh per month. By 2013 that increase would be $190 per year, a 34% increase for the 500 kWh per month residential customer.



Q. WILL THOSE INCREASES IN ANNUAL BILLS BE OFFSET BY SAVINGS IN GENERATION SERVICE COSTS FROM PARTICIPATION IN DR PROGRAMS/RATE OFFERINGS?

A. No. First, the Company is projecting that relatively few residential customers will participate in its DR programs / rate offerings through 2012 (OCA I-19, IV -4). Second, if residential participants save $40 per year they would will still see a substantial increase in their annual bills. (The illustrative saving of $40 is for a residential customer who

reduces his or her demand by 1 kW during critical peak periods at an avoided capacity cost of $40 per kW-year).

Q. HAS THE COMPANY DEMONSTRATED THAT ITS PROPOSED SMT IS REASONABLE?

A. No. The Company's proposed SMT is based upon the same types of analyses that are used to develop base rates. Those analyses are development of revenue requirements, allocation of revenue requirements among rate classes and design of rates to collect the revenue requirements allocated to each rate class.

The Company is proposing to collect $580 million through the SMT. This is a significant amount whose recovery warrants a high level of regulatory scrutiny.

Revenue Requirements

Q. PLEASE SUMMARIZE YOUR CONCERNS REGARDING THE LEVEL OF PROPOSED REVENUE REQUIREMENTS

A. My general concern is that the level of revenue requirement the Company is proposing is based upon a Plan that is not reasonable. Those revenue requirements reflect costs that are much higher than those of other utilities. They also reflect costs for IHDs and modernization of a CIS that are beyond the scope of a Smart Meter Plan. In addition, Allegheny Power is proposing to recover $24 million in accelerated depreciation of its existing meters over the 5 year deployment period. In addition to that general concern, there are several details of the Company's proposal that are problematic. These are rate of return, asset life and recovery of stranded investment.

In terms of rate of return, the Company is proposing to use the return on equity (ROE) determined in its last base rate case prior to each annual update filing and its actual capital structure and debt cost at the time of each annual filing. In this proceeding,

Allegheny Power has proposed that it utilize the 11.5% return determined in its last base rate case in 1994 at Docket No. R-942986. It has been almost 15 years since Allegheny Power's last base rate case, so it is certainly not clear that the ROE resulting from that case is representative of current market conditions. For now, I recommend that the ROE in the most recent litigated electric distribution case for a Pennsylvania utility be used. It is my understanding that this would be 10.1%. Going forward, I recommend that a procedure be developed so that an equity return based on the most recent "Report on the Quarterly Earnings of Jurisdictional Utilities" (Quarterly Earnings Report) prepared by the Bureau of Fixed Utility Services and released by the Commission could be used when there has not been a base rate case for Allegheny Power in the recent past.

The Company has proposed to utilize an unnecessarily short asset life for the meters of 10 years. Act 129 states that the depreciable life of smart meter technology shall be furnished in accordance with a depreciation schedule not to exceed 15 years. (Section (f)(6)(iii).) Each of the other EDCs subject to Act 129 has proposed a depreciable life for smart meters of 15 years. (In fact, PPL adopted a 15 year life for its metering equipment when it put its smart meters in several years ago. Response to OCA 1-3 in Docket No M-2009-2123945.) I recommend that the Company use a 15 year asset life for the smart meters.

The Company is also proposing to recover over $24 million in depreciation on its stranded meter investment. Again, this is a major amount that needs to be reviewed, ideally in a base rate proceeding. If the Commission does allow recovery of these costs via the SMT, the annual expense must be reduced each year to account for the return on rate base effect of the increased build-up of accumulated depreciation.

Cost Allocation

Q. WHAT IS THE BASIS OF THE COMPANY'S PROPOSED ALLOCATION OF THESE REVENUE REQUIREMENTS AMONG ITS SISTER OPERATING COMPANIES AND ITS RATE CLASSES?

A. The Company is proposing to assign the costs of meters directly to each rate class. It is proposing to allocate the joint and common costs of the new system based on the number of meters (OCA I -39). Other than its CIS system, it is not proposing to allocate any costs of its SMIP to its sister operating companies in Maryland and West Virginia.

Q. HAS THE COMPANY DEMONSTRATED THAT THE PROPOSED ALLOCATONS AMONG ELECTRIC RATE CLASSES ARE REASONABLE?

A. No. Generally accepted ratemaking principles require that proposed revenue requirements of this magnitude and complexity be allocated among services and rate classes according to the results of a COS study. For example, the Company's proposed allocation of joint and common costs according to number of customers by rate class ignores the fact that the cost of a meter varies by rate class. A meter for a residential customer is much less expensive than a meter for a C&I customer in one of the general service rate classes. (OCA I-8). In addition, one would expect that some of the other SMIP network and IT costs should be allocated to its sister operating companies in Maryland and West Virginia, if not now then in the future if and when they begin deployment of smart meter technology.

The Company also has not demonstrated that the joint and common costs have been allocated in a manner that reflects the benefits of the systems being installed. Allocating based on number of customers does not properly reflect the benefits since many of the benefits identified relate to energy and demand savings. An allocator that captures these benefits would be more appropriate.

Rate Design

Q. HAS THE COMPANY PROVIDED ANALYSES TO SUPPORT ITS PROPOSAL TO APPLY THE SMT ENTIRELY AS A CUSTOMER CHARGE RATHER THAN A PORTION AS A CUSTOMER CHARGE AND A PORTION AS A DELIVERY OR DEMAND CHARGE?

A. No. Again, fundamental ratemaking principles suggest that once the Company has determined the revenues to be collected from each service and rate class, it should use the results of its cost-of-service study plus an analysis of bill impacts to guide its decisions regarding the portion of the rate class revenue requirement to recover via an increase in the customer charge and the portion to recover via increase in the delivery and/or demand charge components of each tariff.

The Company has provided no justification for recovering all of these costs via a customer charge. The capital expenditure on meters is only about 25 percent of the total capital costs. That is the amount that should be the starting point for determining the portion of the surcharge that is a customer charge. Next, one needs to consider the amount by which the customer charge should be allowed to increase in a given time period. Setting the SMT such that it would increase the existing customer charge dramatically is inconsistent with the ratemaking principle of gradualism. This is particularly important because the SMT as a customer charge is unavoidable and will have a disproportionate impact on low use customers within the residential rate classes. That is why it is important to have a COS and bill impact analysis to guide the determination of the portion of the rate class revenue requirement to recover via an increase in the customer charge and the portion to recover via increase in the delivery and/or demand charge components of each tariff.

Conclusions and Recommendations Regarding Proposed Ratemaking for Cost Recovery

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS REGARDING ALLEGHENY POWER'S PROPOSALS FOR RECOVERING THE COSTS OF THE SMART METER PLAN FROM RATEPAYERS AS WELL AS FOR CREDITING BENEFITS TO RATEPAYERS.

A. The Company proposes to recover the projected five year nominal cost of $580 million of its Smart Meter Plan from all rate classes through a new Smart Meter Technology (SMT) Surcharge that would operate independent of base rates. The proposed SMT is expressed in $ per meter per month, i.e. it would be an unavoidable monthly fixed charge.

The Company proposes to flow the projected distribution service benefits of the Smart Meter Plan to ratepayers through the SMT. It expects that the energy supply cost benefits from the SMIP will flow directly to those ratepayers who reduce peak load in response to the Company's proposed Demand Response programs and rate offerings and indirectly to all ratepayers in the form of lower generation service costs due to the impacts of reductions in peak load wholesale capacity and energy prices.

The cost recovery aspects of the Company's proposed Smart Meter Plan include the level of annual revenue requirements to be recovered, the allocation of those revenue requirements among rate classes and the design of the specific rates by rate class to recover those allocated revenue requirements.

The level of revenue requirements the Company is proposing are based upon a Plan that is not reasonable. In addition they reflect a rate of return based on a return on equity that is out of date, asset lives that are too short and recovery of $24 million in stranded investment.

The Company's allocation and rate design proposals are not guided by either a cost-of-service (COS) study or an analysis of bill impacts. The absence of these analyses is of particular concern since the Company's proposed SMT will increase customer charges of residential customers by a significant amount, which in turn will lead to extreme increases in the bills of low usage residential customers. The Company should have prepared a COS to guide its proposed allocation of the Smart Meter Plan's revenue requirements among rate classes. In addition, it should have used the results of that COS study and an analysis of bill impacts to determine the portions of the revenue requirements allocated to residential customers that should be recovered as surcharges on the monthly customer charge and delivery charge components of tariffs respectively.

Based upon that conclusion, I recommend that the Commission require the Company to set its level of revenue requirements to recover only those Plan costs that the Commission determines are reasonable. When setting those revenue requirements the Company should be required to use a rate of return reflecting a return on equity consistent with current conditions and asset lives of fifteen years for smart meters. Recovery of any stranded investment should be deferred to the next base rate case. In terms of allocation and rate design, the Company should be required to present the results of a COS study and an analysis of bill impacts before it is allowed to recover any costs from residential customers via a fixed monthly surcharge.

Q. **DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

A. Yes.

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of West Penn Power Company	:	
d/b/a Allegheny Power For Expedited	:	DOCKET NO. M-2009-2123951
Approval of its Smart Meter Technology	:	
Procurement and Installation Plan	:	

EXHIBITS TO THE

DIRECT TESTIMONY

of

J. RICHARD HORNBY

On behalf of:

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

October 16, 2009

DIRECT TESTIMONY OF J. RICHARD HORNBY

LIST OF EXHIBITS

Exhibit___(JRH-1)	Resume of James Richard Hornby
Exhibit___(JRH-2)	March 2009 Testimony of New Jersey Commissioner Frederick Butler, President of NARUC, to the United States Senate Committee on Energy and Natural Resources
Exhibit___(JRH-3)	Capital Cost of Allegheny Power Smart Meter Plan versus Advanced Metering Infrastructure (AMI) Projects of Other Utilities
Exhibit___(JRH-4)	Allegheny Power Smart Meter Plan - Projected Total Costs and Benefits (15 year Net Present Value)
Exhibit___(JRH-5)	Allegheny Power Smart Meter Plan – Projected Reductions in Peak Load from Demand Response Programs and Rate Offerings Enabled by Smart Meter Plan
Exhibit___(JRH-6)	Impact of Allegheny Power Proposed Smart Meter Technology Surcharge on Monthly and Annual Bills

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Consultant,* 2006 to present.
Analysis and expert testimony regarding planning, market structure, ratemaking and contracting issues in the electricity and natural gas industries.

Charles River Associates (formerly Tabors Caramanis & Associates), Cambridge, MA.
Principal, 2004-2006.
Senior Consultant, 1998-2004.
Provided expert testimony and litigation support in several energy contract price arbitration proceedings, as well as in electric and gas utility ratemaking proceedings in Ontario, New York, Nova Scotia and New Jersey. Managed a major productivity improvement and planning project for two electric distribution companies within the Abu Dhabi Water and Electricity Authority. Analyzed a range of market structure and contracting issues in wholesale electricity markets.

Tellus Institute, Boston, MA.
Vice President and Director of Energy Group, 1997–1998.
Presented expert testimony on rates for unbundled retail services in restructured retail markets and analyzed the options for purchasing electricity and gas in those markets.
Manager of Natural Gas Program, 1986–1997.
Prepared testimony and reports on a range of gas industry issues including market structure, unbundled services, ratemaking, strategic planning, market analyses, and supply planning.

Nova Scotia Department of Mines and Energy, Halifax, Canada; 1981–1986
Member, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986
Member of a federal-provincial board responsible for regulating petroleum industry exploration and development activity offshore Nova Scotia.

Assistant Deputy Minister of Energy 1983–1986
Responsible for analysis and implementation of provincial energy policies and programs, as well as for Energy Division budget and staff. Directed preparation of comprehensive energy plan emphasizing energy efficiency and use of provincial energy resources. Senior technical advisor on provincial team responsible for negotiating and implementing a federal/provincial fiscal, regulatory, and legislative regime to govern offshore oil and gas. Directed analyses of proposals to develop and market natural gas, coal, and tidal power resources. Also served as Director of Energy Resources (1982-1983) and Assistant to the Deputy Minister (1981-1982.

Nova Scotia Research Foundation, Dartmouth, Canada, Consultant, 1978–1981
Edited Nova Scotia's first comprehensive energy plan. Administered government-funded industrial energy conservation program—audits, feasibility studies, and investment grants.

Canadian Keyes Fibre, Hantsport, Canada, Project Engineer, 1975–1977

Imperial Group Limited, Bristol, England, Management Consultant, 1973–1975

EDUCATION

M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.
Thesis: "An Assessment of Government Policies to Promote Investments in Energy Conserving Technologies"

B.Eng. Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973

EXPERT TESTIMONY AND LITIGATION SUPPORT (1987 to present)

Provided expert testimony and/or litigation support on planning, market structure, ratemaking and gas supply/fuel procurement in the electric and gas industries in approximately 100 proceedings in over thirty jurisdictions in the United States and Canada. List of proceedings available upon request.

BEFORE THE
UNITED STATES SENATE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

TESTIMONY OF THE HONORABLE FREDERICK F. BUTLER
COMMISSIONER, NEW JERSEY BOARD OF PUBLIC UTILITIES

ON BEHALF OF THE
NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

ON

"Smart Grid"

March 3, 2009

National Association of
Regulatory Utility Commissioners
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Washington, D.C. 20005
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Good morning Chairman Bingaman, Ranking Member Murkowski, and Members of the Committee:

My name is Frederick F. Butler, and I am a member of the New Jersey Board of Public Utilities (NJBPU). I also serve as President of the National Association of Regulatory Utility Commissioners (NARUC), on whose behalf I am testifying here today. I am honored to have the opportunity to appear before you this morning and offer a State perspective on "Smart Grid".

NARUC is a quasi-governmental, non-profit organization founded in 1889. Our membership includes the State public utility commissions serving all States and territories. NARUC's mission is to serve the public interest by improving the quality and effectiveness of public utility regulation. Our members regulate the retail rates and services of electric, gas, water, and telephone utilities. We are obligated under the laws of our respective States to ensure the establishment and maintenance of such utility services as may be required by the public convenience and necessity and to ensure that such services are provided under rates and subject to terms and conditions of service that are just, reasonable, and non-discriminatory.

There's a worn-out cliché that goes something like this: Don't put the cart before the horse. In an industry as old as the electric utility sector, this saying aptly describes the situation we face in dealing with the modern Smart Grid and future demand growth.

As a State regulator in New Jersey and co-chair of a national board analyzing Smart Grid issues, I am absolutely convinced of the Smart Grid's potential to revolutionize how energy is delivered and consumed. I know the Smart Grid can change how utilities oversee their networks and improve reliability. I know that, in the end, consumers could have greater control over their usage and have the potential to lower their bills. I also know, however, that if we do not do this correctly, if we move too quickly and promise too much we can endanger our coming close to meeting any of those lofty aspirations.

That is why it is important to remember that old cliché and not put the cart before the horse. The benefits of the Smart Grid are obvious, and we must be sure that we move deliberately and in stages so that the costs of rolling out the necessary infrastructure are borne by those who will benefit. If we expect the horse—i.e. the consumers—to push the cart before it is ready, we many never get the Smart Grid off the ground. This means that we should not focus immediately on the end user and demand response; rather, we must start with the backbone—the transmission and distribution systems—while proceeding carefully to go inside consumers' homes.

Achieving the ultimate goal of reliable service at a fair and reasonable price is becoming harder and harder in this era of rising costs. There is a high probability that within the next three to ten years all electricity consumers will be facing higher costs because of rising fuel and commodity prices, as well as the initial sticker shock of federal and State initiatives to increase renewable generation and the anticipated costs associated with climate change legislation. These costs are and will continue to hit energy

companies hard, and State regulators are faced with having to approve rate increases that a growing number of consumers may not be able to afford. Should the potentially substantial price tag of Smart Grid be suddenly thrust upon them, not withstanding the federal funding increase in the stimulus law, ratepayers will not be happy.

The utility industry is facing tremendous challenges, and we all need to welcome new technologies that could help this country become more efficient while bolstering the existing transmission grid. The Smart Grid has this potential, but only if embraced by utilities and, most importantly, consumers. Without getting the consumers on board, the Smart Grid may just be another good intention.

Before going too much further, it must be stated that our nation's energy woes will not be slain by a single silver bullet, but rather by what has been referred to as silver buckshot, a whole array of various and new revolutionary energy programs. This includes building some new transmission, encouraging renewable energy resources, promoting energy efficiency, resolving the nuclear-waste storage problem, and developing new technologies. The easiest and cheapest of this list is, of course, energy efficiency, but we must consider the role new technologies can play in helping us fix our current situation.

Here is where the Smart Grid comes into play. With the right investment and incentives, modernizing the nation's transmission system could revolutionize how and when we use electricity. If done correctly, utilities can streamline their operations and

have more control over their networks. The more efficient we get, the less electricity will be lost on the transmission grid. Consumers, meanwhile, can reduce their usage across the board, and especially during peak times. This can actually lead to reduced electricity bills. From an operational, business, environmental and economic standpoint, the Smart Grid, if implemented properly, can be a major win-win.

But we do need to be careful. Right now, we are selling the Smart Grid as a means of empowering consumers to lower their usage and, correspondingly, their energy bills. While this may ultimately be the case, we must learn our lesson from the restructuring experience before heading down this path. The promise of restructuring was that consumers would save money by shopping for power. Nearly half the States introduced some kind of restructuring legislation in the mid- and late-1990s. Congress also considered mandating a national restructuring scheme during the late 1980s and early 1990s. In many States, rates were cut and/or frozen for a set number of years, so at the outset, restructuring seemed to be a success.

The 2000-2001 Western Energy Crisis prompted many to rethink this approach. Instead of lower prices, consumers saw their rates skyrocket as utilities were forced to buy electricity through the volatile spot-market costs which, we later found out, were being manipulated. Along the East Coast, starting in 2006, when rate caps expired in Maryland, ratepayers and politicians led a mutiny that nearly resulted in the demise of the State's Public Service Commission. Cooler heads prevailed and the massive rate increases were phased in over time, but many consumers still feel burned. Delaware and

Illinois have had similar experiences. We have not had these kinds of problems in New Jersey, but the sting in many States is being felt across the country.

The problem here was not restructuring per se, but it was the way it was sold to consumers. Instead of determining the best way to move forward deliberatively, we jumped right in, with the promise of lower rates to follow. Because of this approach, and because of the results, the concept of restructuring has taken a significant hit. Indeed, we put the cart before the horse.

We cannot make this same mistake with the Smart Grid if we want it to succeed. There is no doubt that the Smart Grid will bring consumers significant benefits. However, if we want to make the biggest impact, we should consider a different approach and concentrate first on the operational side while we educate consumers and deploy smart meters very strategically. Many utilities, engineers, and vendors have extolled the virtues of how an updated, modernized transmission system will give grid operators a much better view of their transmission and distribution network. New technologies can be installed on distribution poles and on the lines themselves to give advanced warning of a power surge. A modernized grid can help utilities lower costs by reducing the need for sending out trucks to read meters or restore power. Business operations can be streamlined, reliability can be improved, and money—real money—can be saved.

For instance, phasor measurement and backscatter sensors on the transmission grid, along with video sagometers and wireless mesh sensors, can use radio-frequency

identification (RFID) technology to give utilities real-time information on the status of specific lines. These sensors can detect problems on the grid as they develop and that are relayed back to the utility for resolution before they escalate into a massive blackout. Instead of relying on costly and time-consuming manual visits from work crews, utilities will have up-to-date information on their system and can act accordingly. These reasons alone will make the Smart Grid a safe and worthwhile investment for utilities, whether or not end-users choose to get on board later.

From my perspective as a State regulator, it seems to make the most sense that if we're going to begin investing in a Smart Grid, we should start here. If we start with the backbone – if we update and improve the delivery system first – we will see the utility company side benefits of the Smart Grid. The question of who pays is important—and with consumers already challenged because of rising rates and the economic downturn, we must be careful before putting more on their plate. In this case, starting with the backbone means the initial investments would be paid for by the utilities themselves, as they will be the initial beneficiaries, and not immediately by ratepayers. While we all would like to see end users enjoy the benefits of Advanced Metering Infrastructure, the Smart Grid can still make an immediate and long-lasting improvement for the industry by making the delivery system more efficient. This alone will result in considerable savings and fewer outages. Meanwhile, advanced meters and the applications they enable can at the same time be deployed strategically in pilot and demonstration projects thus demonstrating the benefits to end-use customers. Moreover, these backbone investments

are necessary at some point during the transition to the Smart Grid. So let's ready the cart to be pulled before asking the horse—or consumers—to pull it.

The second part of Smart Grid should be developed and implemented in an effort coordinated by State and local officials. In my experience as a Commissioner I have found that a key component for an initiative such as Smart Grid is public outreach. We should use some federal resources to explain to the consumers that a new Smart Grid program is worthwhile. Most State commissioners understand the benefits of Advanced Metering Infrastructure and time-of-use rates, but most consumers do not. Because these new programs will need new rate structures that will be disruptive to habits of paying energy that have been in place for over 120 years, we must proceed carefully to avoid public backlash. Time-of-use rates are being welcomed by some sectors of society and feared by others. States must be sure that consumers will embrace the technology and tolerate the initial investment. So far, this is only occurring in a few States. In California, for example, the Public Utilities Commission is committed to rolling out the Smart Grid to their consumers. The State has taken a number of steps laying out the initial foundation, including a decision in September 2008 approving a smart-metering program for Southern California Edison, one of the State's three investor-owned utilities.

Still, my colleague on the California PUC, Commissioner Dian Grueneich, said that despite the commission's conclusion on the benefits, key California consumer groups remain unconvinced that the Smart Grid will deliver. The advanced metering infrastructure deployment for Southern California Edison will cost about $1.63 billion,

with estimated benefits ranging from $9 million and $304 million for consumers. Speaking in September 2008 at the Grid Week forum in Washington, D.C., Commissioner Grueneich said the PUC moved forward despite the strong opposition from some consumers. "Very significant costs have been authorized and put into rates," she said. "Our consumer groups are not comfortable" with this.

The concern that many of my colleagues are trying to resolve is that consumers are convinced that the Smart Grid will only raise their rates with no discernable benefits. In a high-priced environment, some or perhaps most consumers see advanced metering rollouts as just one more headache and budget buster and are particularly scared that utilities and vendors will keep raising rates as the technology changes.

California will be launching a major education, marketing, and outreach campaign next year. This will need as much support as possible from all parties so the program can succeed and perhaps reduce the sting on ratepayers. Once they see the benefits, they should also see how they can turn this into savings.

As this experience demonstrates, the way a Smart-Grid program is structured and rolled out is absolutely key to its success, and regulators and industry must be flexible to ensure that consumers will not feel inundated or overwhelmed. Depending on how a Smart-Grid program is structured and rolled out will be the key to its success, and Congress, regulators, and industry must be flexible to ensure that consumers will not feel inundated or overwhelmed. As a State regulator, here's how I think we should proceed.

A good place to look is at the work we're doing with the NARUC-Federal Energy Regulatory Commission (FERC) Smart Grid Collaborative, which I co-chair with FERC Commissioner Suedeen Kelly. As this is an issue that cuts across both wholesale and retail energy markets, the dialogues we are initiating through this process will help us all as we move forward. The Collaborative brings together a diverse group of State and federal regulators, consumer groups, and industry experts and allows us to talk in a public setting about these issues.

The Collaborative has met three times since its February 2008 inception, most recently at the NARUC Winter Committee Meetings last month. We have discussed issues such as cost allocation, specific technologies, interoperability, and pilot programs with consumers and industry executives who are promoting Smart-grid technologies.

In my role as co-chair of this Collaborative, I have spent a considerable amount of time getting up to speed on the different technologies and pilot programs throughout the country. I am, as is the entire Smart-Grid industry, very interested in the pilot program in Boulder, Colorado, which is aiming to become the nation's first "Smart Grid City." I have discussed the many different pilots with my regulatory colleagues and am convinced that we must take a deliberate approach to introducing these new technologies to end-use consumers. As described above, consumers have yet to "buy into" the concept of the Smart Grid, and when they see any associated rate increases, they are more than likely not going to be pleased. Smart meters are expensive—right now we're talking about

approximately $150 - $200 per meter—so we must be very careful in forcing anyone to upgrade if they are not willing. Pilot programs must be carefully structured in such a way that creates a "buzz" and excitement, not a ratepayer revolt.

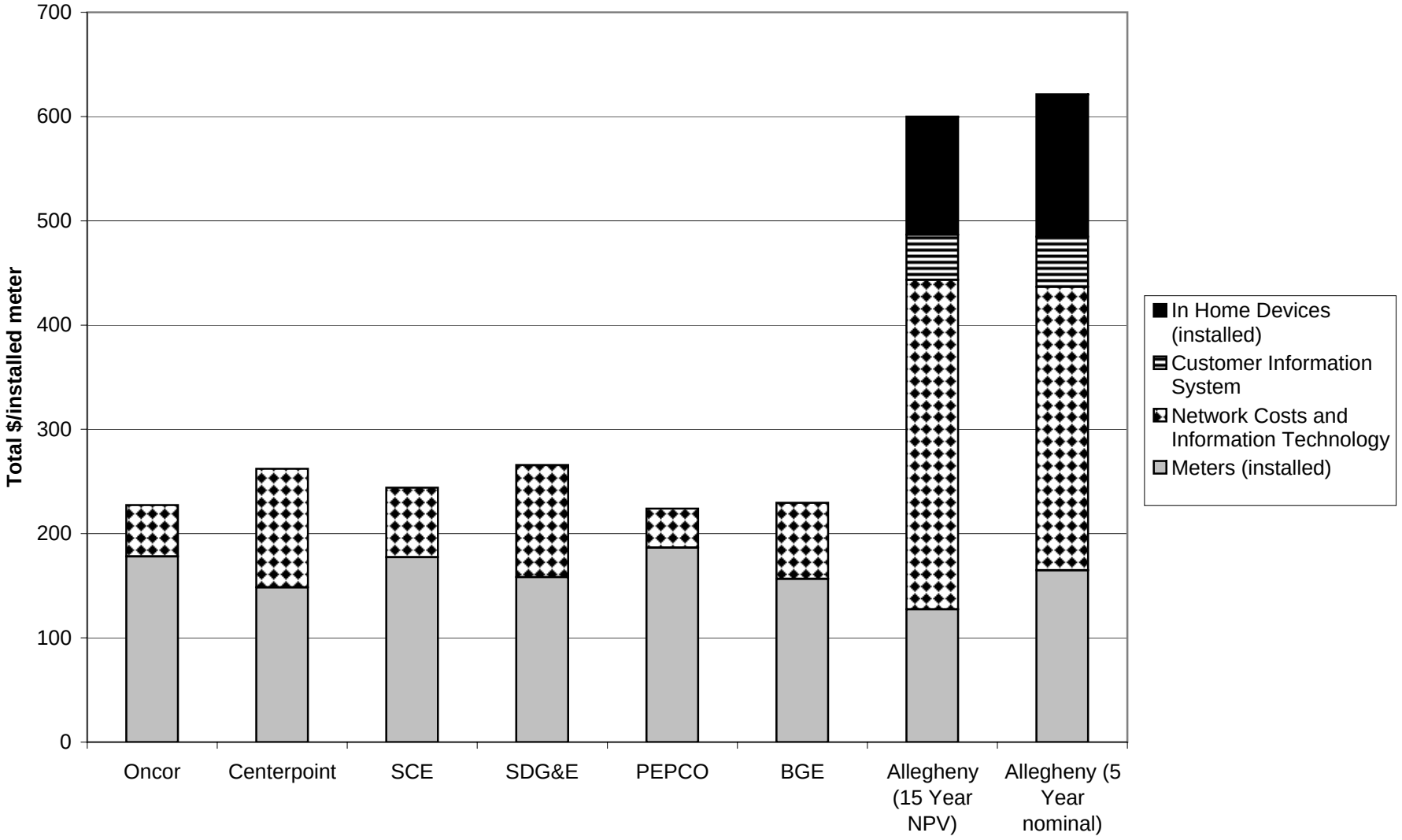
In addition, there should be large-scale "demonstration projects" that cover a larger geographic area. We are all watching the Boulder, Colorado effort and that project's success is instrumental to the future of the Smart Grid. These kinds of projects must cover a significant demographic area that reflects a microcosm of the country at large, including different incomes and education levels. While the pilot programs are useful, these larger projects will give us a glimpse as to how a larger pool of consumers will react to the Smart Grid. The project doesn't have to be huge, but it must be an accurate representation of the society.

This approach lets consumers take part by building interest and selling the product amongst themselves, rather than having Congress, utilities, or regulators do it for them. The consumers who want the meters will get the meters, and through word-of-mouth, others will find out how valuable this new system can be, and will be more willing to endure a slight rate increase to pay for it. What concerns me is that under some proposals, millions of people will get these smart meters whether they want them or not. They will be getting a rate increase and new gadgets that they do not know how to use installed in their homes. I am not sure if this will breed anything but hostility among a rate class that is already facing challenging economic times.

Smart Grid can be successful provided we have federal and State governments working in concert with one another as partners; not working in contrast to one another as adversaries. The challenge before us is great, the technology and potential benefits exciting. The federal government has resources that the States do not; the States have expertise in the development and implementation of programs that the federal government does not have. Therefore, this challenge calls for a true partnership between the States and FERC that we are already developing through the NARUC-FERC Smart Grid Collaborative.

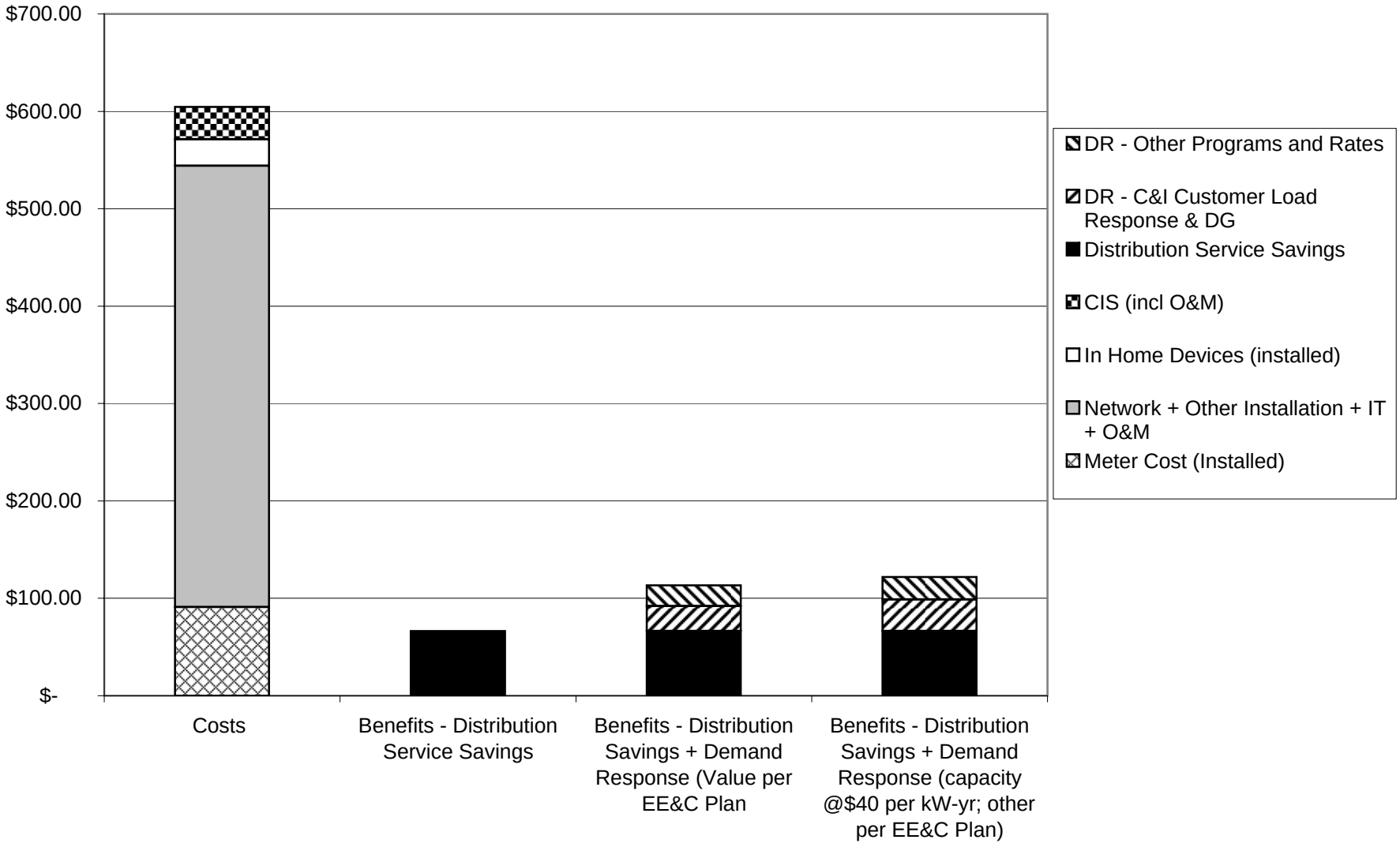
We have to remember that the Smart Grid will only achieve its vast potential if consumers embrace it. While we can certainly see major improvements in efficiencies and reliability by upgrading the transmission and distribution backbone, we will not change consumers' habits and consumption if we are unable to convince them of its promise. I respectfully request that this Committee and this Senate recognize and respect our unique roles so that we can work towards a truly 21st Century electricity delivery system.

Capital Cost of Allegheny Power Smart Meter Plan versus Advanced Metering Infrastructure (AMI) Projects of Other Utilities (as $ per installed meter)



Capital Cost of Allegheny Power Smart Meter Plan versus Advanced Metering Infrastructure (AMI) Projects of Other Utilities								
Utility	**Oncor**	**Centerpoint**	**SCE**	**SDG&E**	**PEPCO**	**BGE**	**Allegheny (15 Year NPV)**	**Allegheny (5 Year nominal)**
State	TX	TX	CA	CA	MD	MD	PA	PA
Data - Projected or Actual, Year					P, 2009	P, 2009	P, 2009	P, 2009
Regulatory Commission Approval (Yes/No	Y	Y	Y	Y	N	N	N	N
# meters (million)	3	2.4	5.3	2.3	0.57	2.1	0.715	0.715
Toptal System Capital costs (million $)								
Meters	535	356	723	364	106	329		
Meter Installation			217					
Sub- total Installed Meter Cost	**535**	**356**	**940**	**364**	**106**	**329**	**91**	**118**
Network Communication	80	99			5	14		
Distribution automation								
Meter Data Management System	55				16	99		
Other							226	194
Customer Information System							31	34
In Home Devices							81	98
Total	682	629	1294	611	128	482	**429**	**444**
Unit capital costs of system expressed as								
$ per installed meter								
Meters (installed)	178	148	177	158	187	157	127	165
Network Costs and Information Technolog	49	114	67	108	37	73	316	272
Customer Information System							43	48
In Home Devices (installed)							113	137
Total	**227**	**262**	**244**	**266**	**224**	**230**	**600**	**622**

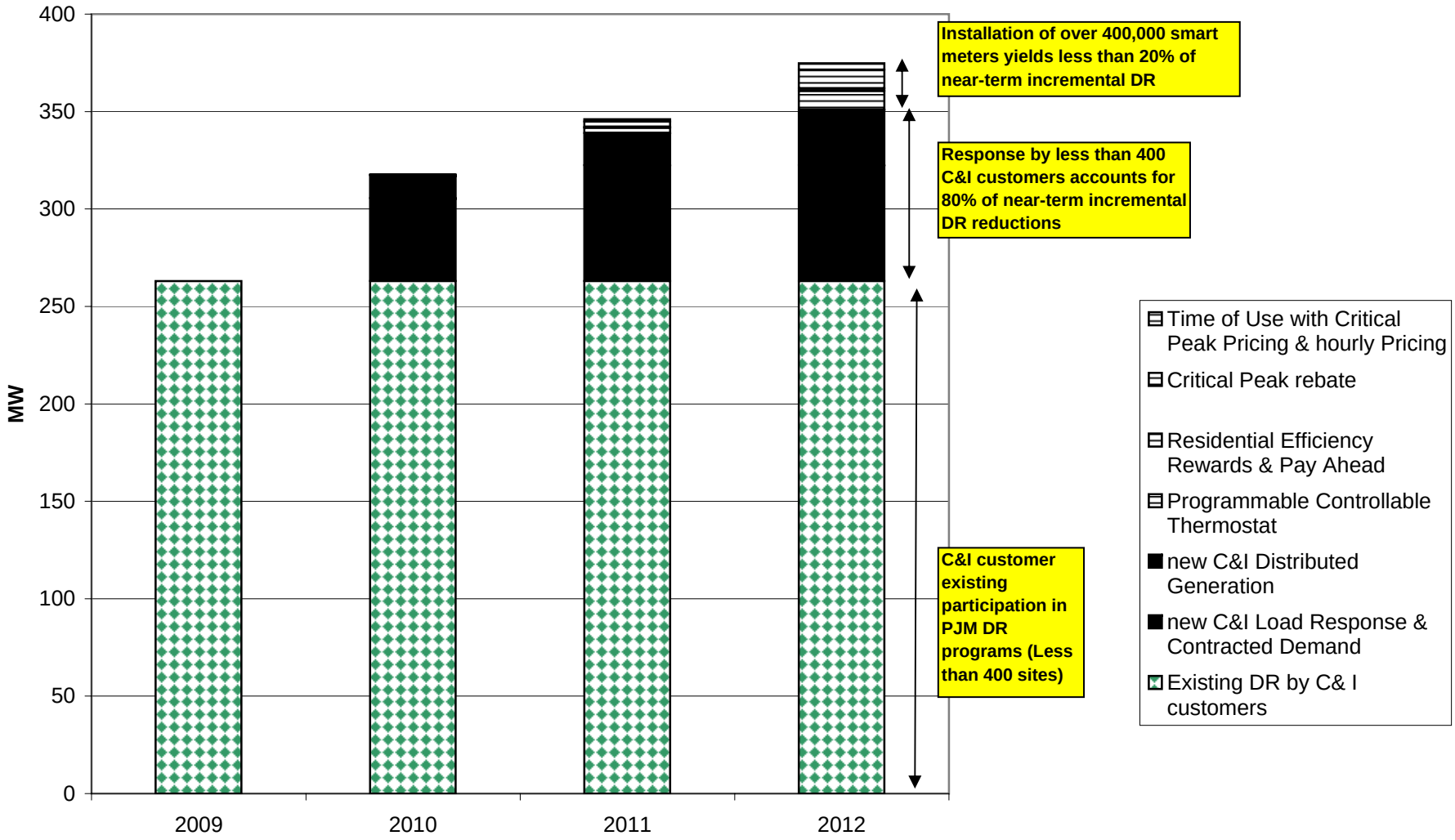
Allegheny Smart Meter Plan – Projected Total Costs and Benefits (NPV)



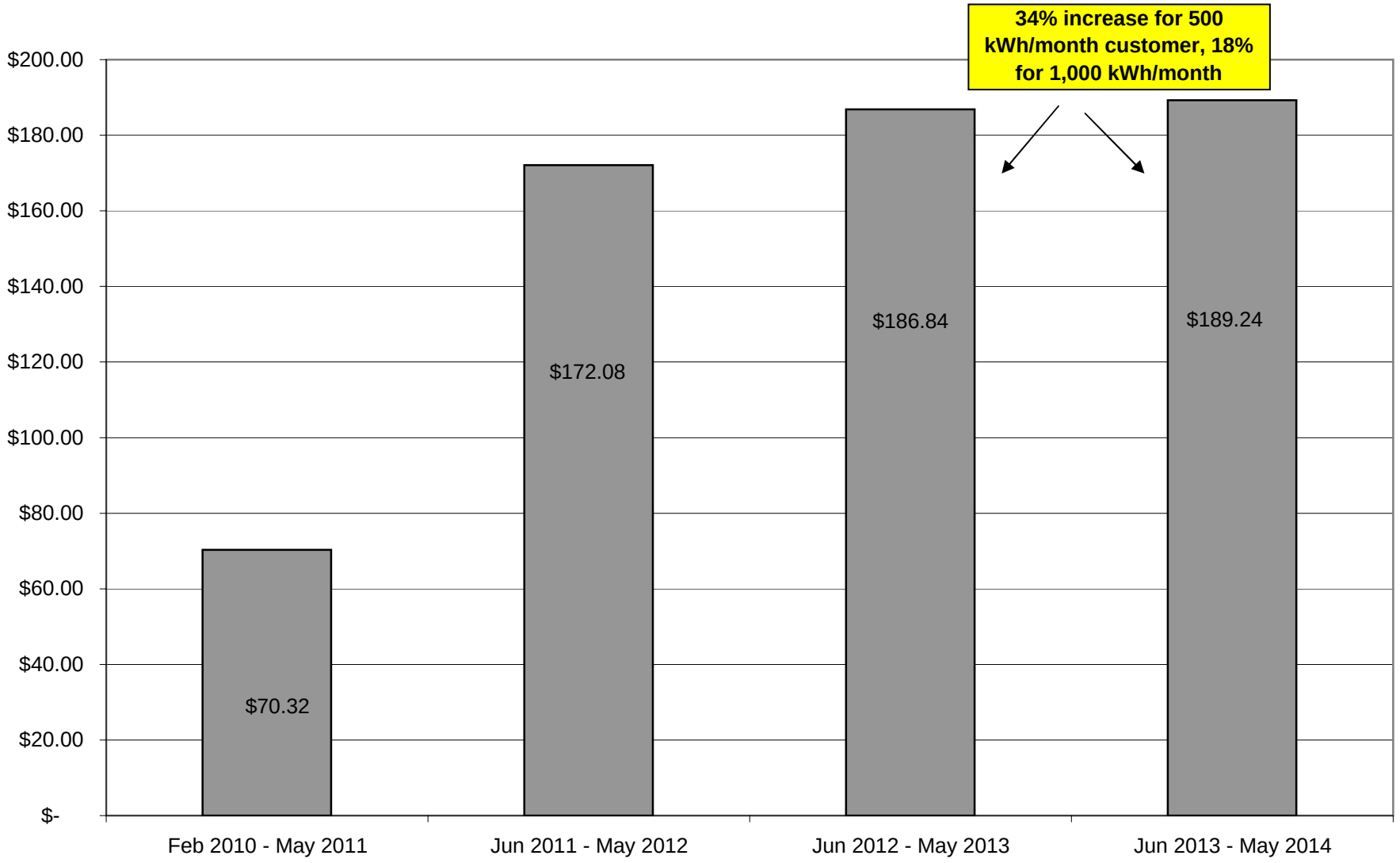
Allegheny Power Smart Meter Plan - Projected Total Costs and Benefits (15 year Net Present Value)

	Case	Synapse Run of AP Case as Filed		Synapse run with Remote C/D; Load Control and In Home Display Capital + Installation		Synapse run with Remote C/D; Load Control and In Home Display Capital + Installation	
$'s in Millions		NPV $ Millions	% of Benefits	NPV $ Millions	% of Benefits	NPV $ Millions	% of Benefits
Costs	**Category**						
	Meter Cost (Installed)	$ 91		$ 91		$ 91	
	Network + Other Installation + IT + O&M	$ 453		$ 453		$ 453	
	In Home Devices (installed)	$ 27		$ 81		$ 81	
	CIS (incl O&M)	$ 33		$ 33		$ 33	
	Total	$ 605		$ 658		$ 658	
BENEFITS	**Scenario**	**Distribution service per Allegheny SMIP; Generation Service per EE&C Plan through 2024 @ 2.23% escalation from 2012**				**Distribution service per Allegheny SMIP; Generation Service per capacity @ $40 per kw yr from 2014 and other benefits at 2.23% escalation**	
Primary Driver	**Category**	NPV Millions	% of Benefits	NPV Millions	% of Benefits	NPV Millions	% of Benefits
SMIP	**Customer Service**	$ 57		$ 57		$ 57	
	Distribution operations	$ 4		$ 4		$ 4	
	Revenue Enhancement	$ 2		$ 2		$ 2	
	Avoided Capital	$ 4		$ 4		$ 4	
	Sub-total SMIP	$ 67	59%	$ 67	59%	$ 67	55%
EE&C	**Programmable Controllable Thermostat**	$ 4		$ 4		5	
	C&I Customer Load Response and Conctracted Demand	$ 18		$ 18		23	
	Distributed Generation	$ 7		$ 7		10	
	Residential Efficiency Rewards and Pay Ahead	$ 6		$ 6		6	
	Critical Peak Rebate	$ 4		$ 4		5	
	Time of Use with Critical Peak Pricing and Hourly Pricing	$ 8		$ 8		8	
						55	
	Sub-total EE&C	$ 47	41%	$ 47	41%	$ 55	45%
Total Benefits - SMIP + EE&C		$ 113	100%	$ 113	100%	$ 122	100%
Benefit / Cost Ratio							
	SMIP Benefit / Cost Ratio	0.11		0.10		0.10	
	EE&C / Cost Ratio	0.08		0.07		0.08	
	Total	**0.19**		**0.17**		**0.19**	

Allegheny EE&C Plan – Projected Reductions (MW) in Peak Load from Demand Response Programs and Rate Offerings Enabled by Smart Meters



Increase in Annual Bill of Residential Customers from Proposed SMT Surcharge versus illustrative annual value of 1 kW of avoided wholesale capacity in APS zone of PJM



Impact of Allegheny Power Proposed Smart Meter Technology Surcharge on Residential Monthly and Annual Bills in 2013

Customer Charges ($/month) - Residential Rate Schedules	EXISTING RATES	SMT Impact	
		$/month	%
Residential			
500 kWh/month	$5.00	$15.77	315%
750 kWh/month	$5.00	$15.77	315%
1000 kWh/month	$5.00	$15.77	315%

Annual Bills of Residential Customers in 2013	Annual Bill at Existing rates	SMT Impact	
	$/year	$/year	%
Residential Electric			
500 kWh/month	$557.46	$189.24	34%
750 kWh/month	$806.19	$189.24	23%
1000 kWh/month	$1,054.92	$189.24	18%

Source - Workbooks to Exhibit__(JRH-6)