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Publisher
Smart Grid Today

SMART GRID TODAY

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Thanks for participating in “Cost Recovery and the Smart Grid: How the Maryland PSC’s Decision Could Change the Way Utilities Recoup Investments ” interactive web conference on Friday, September 17, 2010. This manual contains important information you’ll need to prepare for this event.

THIS MANUAL INCLUDES:

- Dial-in and log-on instructions for accessing the web conference
- Speaker bios and contact information
- Tips for submitting questions to speakers

CONFERENCE DETAILS

Your conference will be held Friday, September 17, 2010 at 2:00 p.m. EDT, 1:00 p.m. CDT, 12:00 p.m. MDT, and 11:00 a.m. PDT. It will last 90 minutes.

If you are using a speakerphone, put the phone on MUTE for the best sound quality.

HOW TO JOIN THE CONFERENCE

Audio

- Dial 1-866-515-6808 approximately 5-10 minutes before the start of the conference.
- Enter your unique PIN (sent in e-mail confirmation).
- You will hear music on hold until the conference has started, or be connected directly if it has already begun.

- If you have trouble with your PIN stay on the line and an operator will assist you.

Web

- Please click on the following link: <http://web.beaconlive.com>
- On the “Join a Meeting” side of the login page, enter the Room name: **1687**
- Enter your unique PIN (same as the audio PIN you received) in the access code field.
- Click on “Join Meeting” to access the web presentations.

If you are disconnected at any point during the call, just call back and repeat the process.

Only one site per PIN is allowed.

HOW TO SUBMIT QUESTIONS

You may submit questions by using the chat window in the lower left corner of the web portal. This option plus live Q&A will be available during the conference. If you would like to ask a question anonymously, let us know and we will not announce who asked it.

TIPS FOR ASKING QUESTIONS

You are on "listen only" mode unless you choose to participate in the live Q&A. If you want to ask a live question:

- Be sure to UNMUTE your phone before you are called on so there’s not a pause in the conference and the moderator does not pass you over for the next question.
- Lift the handset while asking your question for best sound quality.
- Be sure there are no loud background noises in the room while asking your question.

We at *Smart Grid Today* are excited about this session with a panel of experts who will help you understand how the Maryland PSC’s decision could affect the way you recoup the costs associated with smart-grid deployment.

Should you have questions or concerns, please call +1-301-769-6812 (1-888-637-7776 toll-free in US & Canada).

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Speaker Bios and Contact Information



Robert Wilhite is Senior Vice President, Intelligent Networks and Communications at KEMA Consulting and a 25-year veteran of the utility industry. Through a combination of technical capabilities and business problem-solving skills, Mr. Wilhite has provided numerous consultative solutions in strategic planning, new business/market analysis, financial analysis, business modeling and process design plus program implementation. Mr. Wilhite is directly responsible for achieving strategic growth and operational performance objectives for KEMA's global AMI, communications and utility automation practice areas. He also serves on the board of trustees of Utilimetrics and as chairman of the Implementation work group at the GridWise Alliance. Mr. Wilhite was named one of the Top 25 Consultants in the U.S. by Consulting Magazine in 2009.

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Cost Recovery and the Smart Grid

Smart Grid Today Webinar Discussion



September 17, 2010

Experience
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Smart grid technologies are potentially disruptive to the traditional utility value chain, particularly for consumers

Traditional Utility Value Chain



Leading Smart Grid Considerations

- | | | | |
|---|--|--|--|
| <ul style="list-style-type: none"> • Distributed generation and energy systems • Distributed energy storage/ renewable energy • Conservation voltage reduction | <ul style="list-style-type: none"> • Synchronized Phasor Measurement Units (PMUs) • Flexible AC Transmission • High Voltage DC • Substation energy storage | <ul style="list-style-type: none"> • Advanced Metering Infrastructure (AMI) • Line fault sensors • Automated reclosers • Automated Volt/VAR control • Automated voltage regulators • Automated capacitor banks | <ul style="list-style-type: none"> • Home area networking • Autonomous DR • Smart appliances • Distributed generation • Integration of building controls • Plug-in Hybrid Electric Vehicles • Micro energy storage • Rooftop solar energy • Pre-payment systems • Time-based pricing • Third-party service providers (e.g., DR) |
|---|--|--|--|

Smart Grid deployment will open a \$100B market in smart technologies¹

Degree of Market Disruption

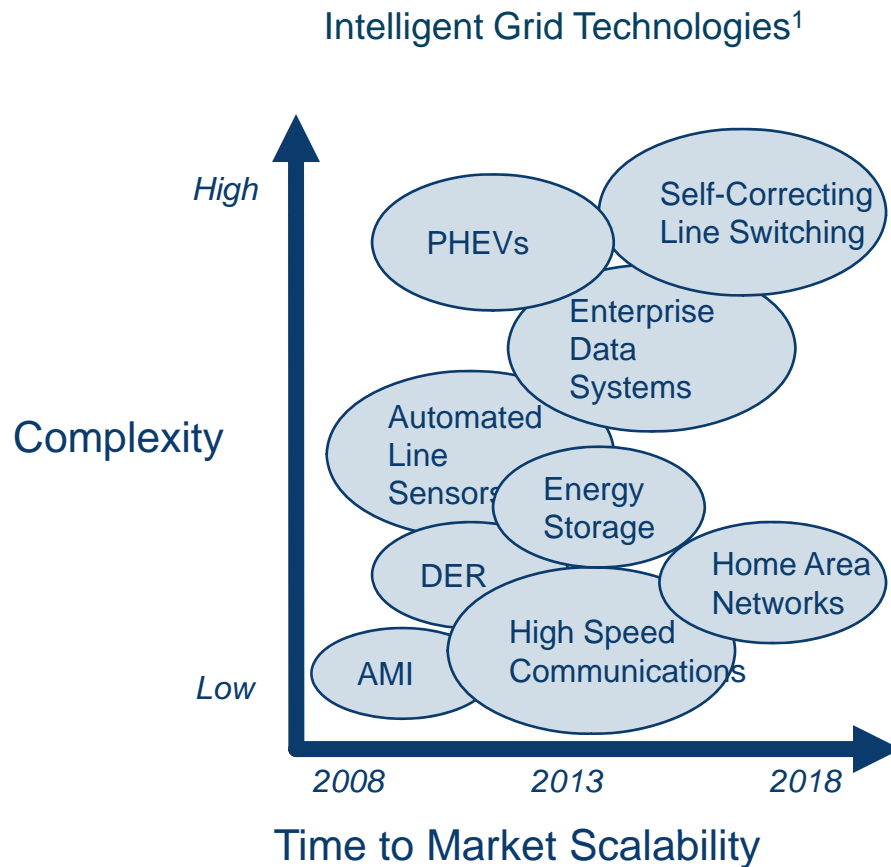
Minimal Moderate Large Transformational

Note 1: Department of Energy; The Reform Institute, "The Smart Alternative: Securing and Strengthening Our Nation's Vulnerable Electric Grid"



Regardless of the specific architecture, many utilities are focused on similar core issues or potential program risks

Selected Utility Smart Grid Efforts



- How can initial investments in AMI or Smart Metering be leveraged into a broader Smart Grid architecture?
- Which technologies are ready for investment now? Which ones should be deferred?
- What is the right regulatory recovery scheme (short and long-term)?
- How will consumers accept and interact with these applications?
- How will incremental CapEx requirements be integrated into existing grid resource plans?
- What rate and service offerings are needed to maximize consumer participation?
- How well will standards drive innovation, while maintaining security and reliability?

Given these factors, seeking to apply traditional utility cost recovery mechanisms to smart grid creates the need for variations in economic treatment

Traditional Utility Cost Recovery Methods

Surcharges – Often approved as a tariff rider, rather than incorporated into the rate base initially; utilize true-ups of actual vs. estimated costs in different intervals.

Trackers – Enables cost recovery as they arise, rather than requiring a prediction of costs and conducting a true-up of actual vs. estimated costs

Rate Base recovery – Program costs are treated as a prudent capital expenditure and are approved in rate proceedings

Variations within Smart Grid Cost Recovery Categories

- Caps on Smart Grid/ AMI cost recovery categories (e.g., operational, capital)
- Revenue requirements and risk of over-recovery, if benefits not fully realized/ tracked
- Carrying costs
- Accelerated depreciation for short-life assets
- Total Resource Cost test (TRC) metrics and thresholds for costs v. benefits
- Timing of cost/ benefit evaluation (in a pre- or post-deployment test year)
- Timing of recovery (pre, during, or post deployment)
- Hybrid - track some costs and recover, others via rate base

Smart grid or AMI cost recovery is well underway in numerous jurisdictions

There are emerging variations in tariffs, rate design, utility and state revenue and ratemaking requirements – *yet no definitive trend has emerged*

Cost Recovery Mechanism	States/ Utilities
<i>Surcharge (tariff rider) with periodic true-ups</i>	IL (ComEd); MA (Fitchburg, Western Mass Electric); NJ (ACE, JCP&L; PSE&G); OH (all IOUs); OK (OG&E); OR (PGE); PA (DQE, FE, PECO, PPL); TX (Oncor, CenterPoint Energy, TNMP, AEP); VT (Central VT PS)
<i>Rate base recovery - (either approved or deferred)</i>	AZ (APS); DC (Pepco); DE (Delmarva); IN (Duke Energy, AEP); MD (BGE, Pepco, Delmarva); MI (CE, DTE)
<i>Allowed rate-basing of some capital investment</i>	CA; CO (Xcel); MA; OR (PGE)
<i>Cost Recovery Tracker</i>	CA; MA (NSTAR); ME (CMP, BHE); WI (WP&L)
<i>AMI or smart grid under consideration; cost recovery ruling pending</i>	CT (CL&P); FL (FPL); GA (Southern); ID (Idaho Power); KY (Duke); SC (Duke)
<i>AMI or smart grid ruling requires utility re-filing</i>	HI (HECO); IA (IP&L); NY (all IOUs)

With these proceedings, other key trends are emerging related to economic analysis and cost recovery

Cost Recovery Trends

- Most business cases are challenged to quantify enough operating benefits to cover program costs – *customer or societal benefits often* needed to reach a positive NPV, yet not consistently considered in each state
- *Security / cyber security* represents a growing regulatory issue, not just a federal concern, and is requiring greater focus (and program cost impacts)
- *Concerns over data privacy and protection* are also increasing, with inconsistency in state requirements and variations in regulatory attention
- As a result of strong reliance on energy efficiency and demand response in the business case, we should see more utilities seek *rate decoupling* options
- Level of intervention from consumer groups and other interested parties is increasing the complexity of proceedings and depth of discussion regarding risks, suitability of costs, and ability to achieve benefits
- Program drivers and performance metrics (e.g., cost, quality, time) will emerge more often for implementation tracking and risk mitigation



Thank you for your interest.

Rob Wilhite

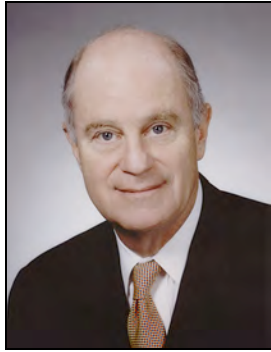
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Experience
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Dr. Alan R. Schriber is Chairman of the Public Utilities Commission of Ohio. He was appointed by Governor Bob Taft in 1999 reappointed in 2004, and reappointed again by Governor Ted Strickland in 2007. Chairman Schriber also served as a PUC commissioner from 1983-1989, appointed by former Governor Richard F. Celeste. As chairman, he regularly testifies before the Ohio legislature and has testified before the United States Congress on several issues including electric reliability. Chairman Schriber also serves as chairman of the Ohio Power Siting Board. An experienced economist, he was an assistant professor of economics at Miami University in Oxford, Ohio; owner and president of ARS Broadcasting Corp. in Cincinnati, and a personal investments manager. Chairman Schriber earned a bachelor's degree in economics from the University of Wisconsin, a master's degree in economics from Miami University, and a doctorate in economics from Indiana University.

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Smart Grid Today

September 17, 2010

Alan R. Schriber, PhD

Chairman

Public Utilities Commission of Ohio



Who is the customer?

- Largely residential
- Most commercial and industrial already equipped



Customer resistance

- Privacy
- Security
- Common misconceptions

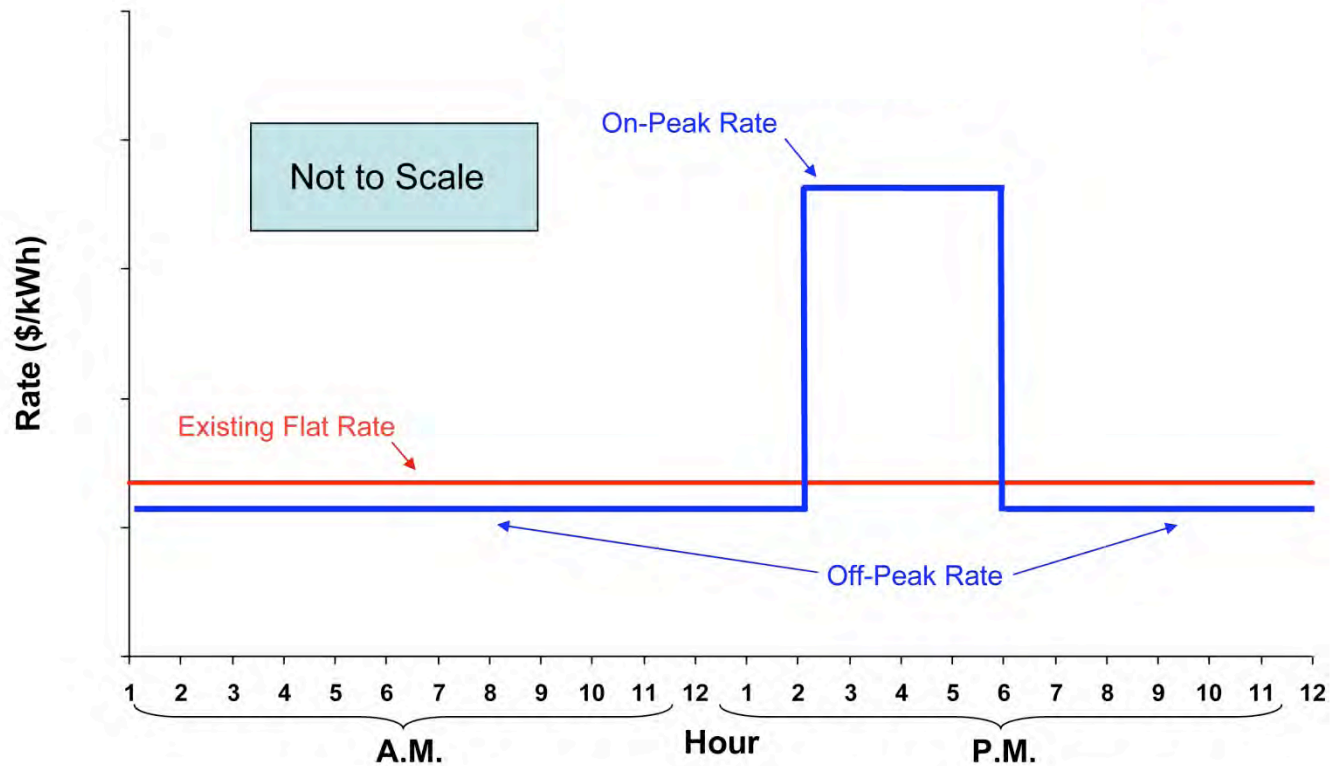


Interaction with utility

- View personal load profile via in-home display
- In-home load control:
 1. Simple device (PCT)
 2. Complex device (appliance controls)

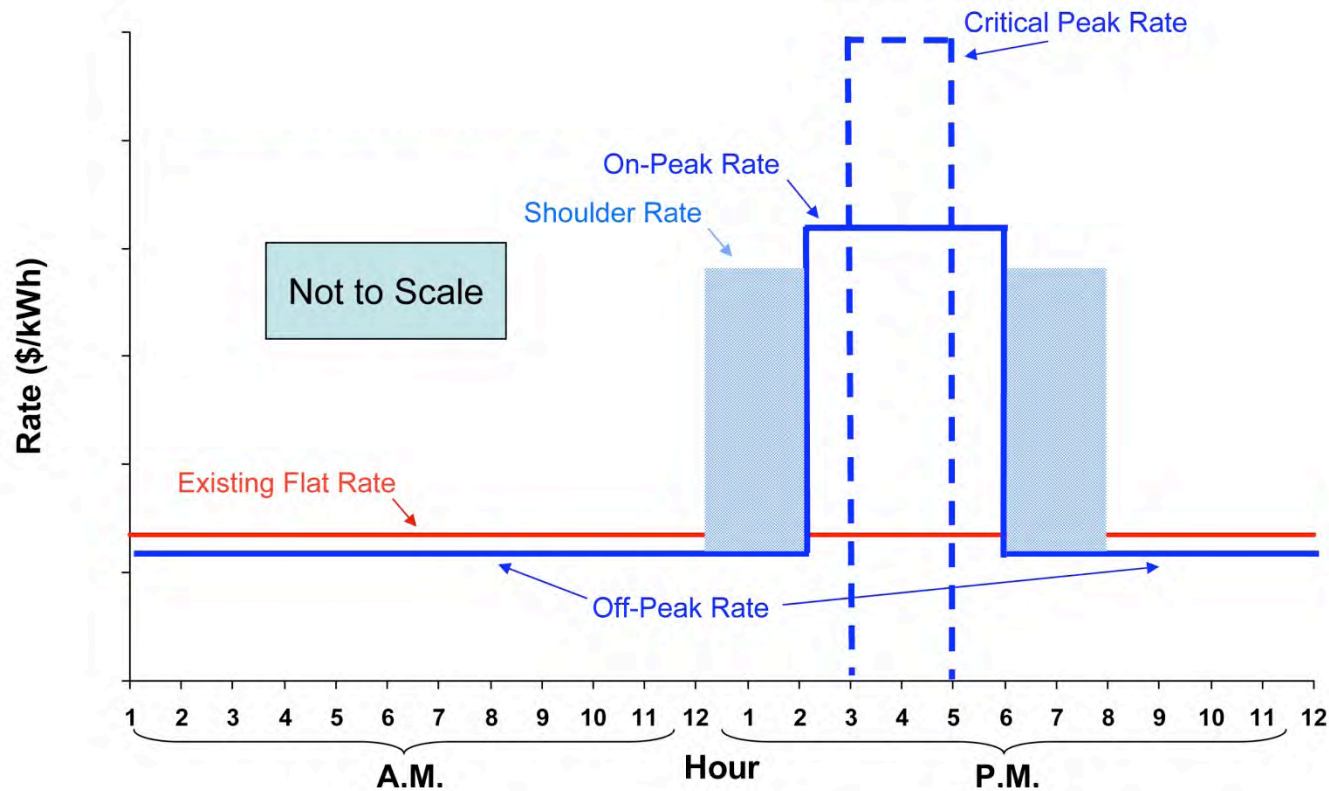


Simple two-tier pricing



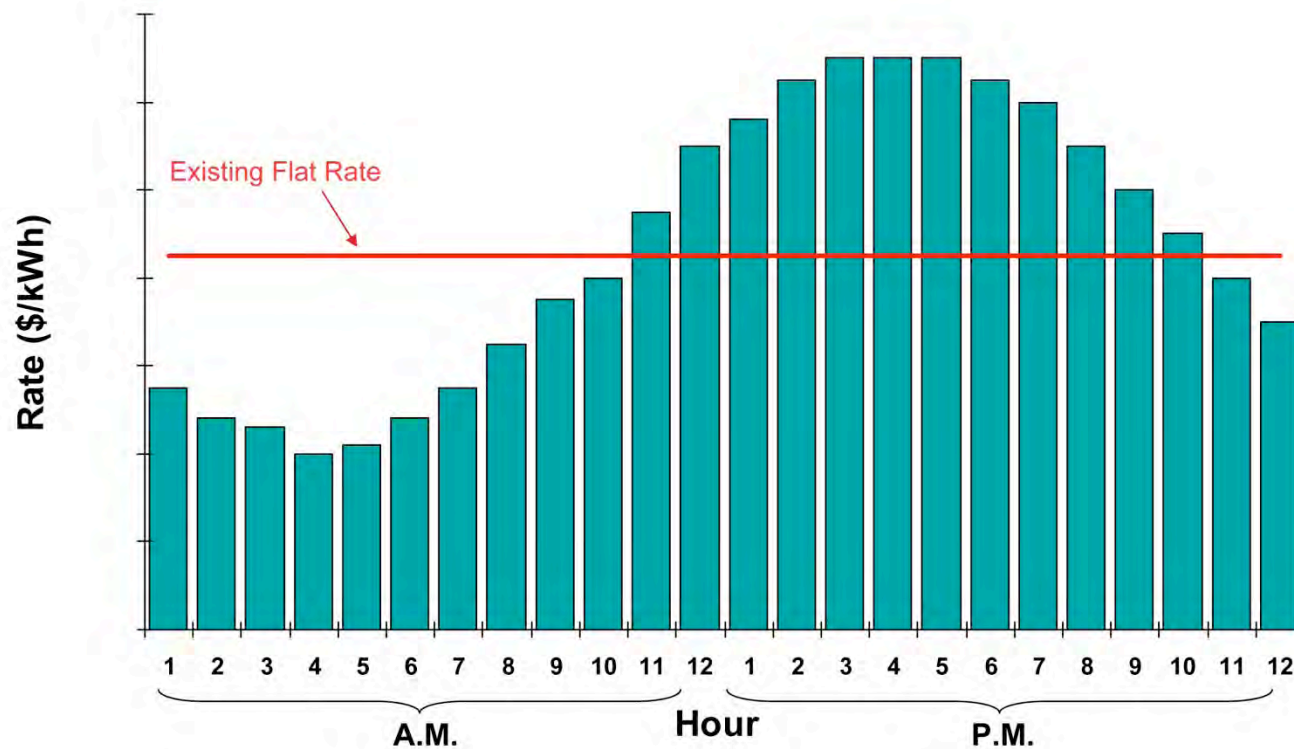


Two-tier + critical peak





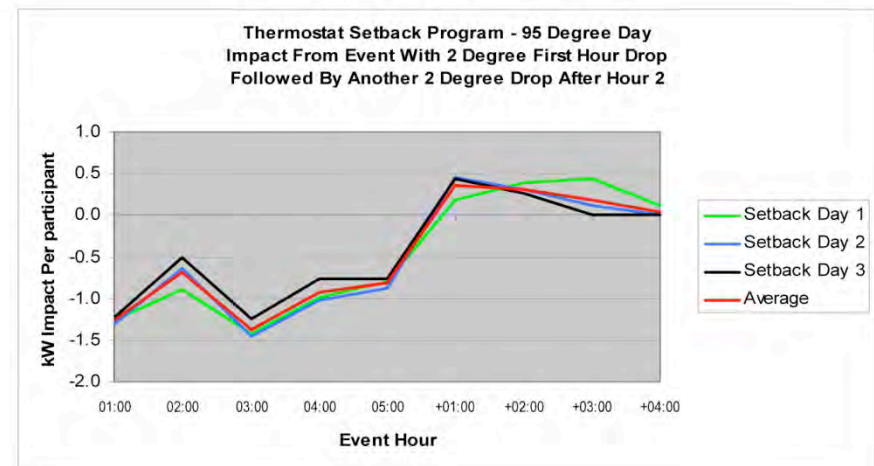
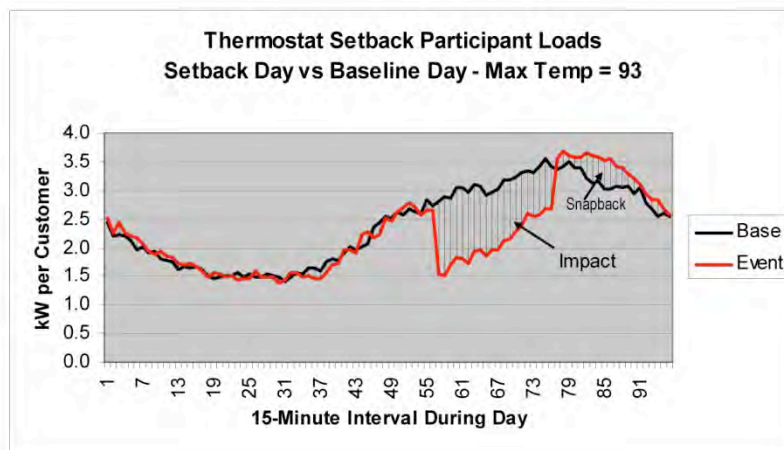
Real time pricing





Thermostat set-back

- 15-minute intervals
- Customer override





Barry Smitherman was appointed to the Texas PUC in 2004, was reappointed in 2007 and promoted to chairman later that year. In 2009, he received the State Leadership award from the American Wind Energy Association for the PUC's pioneering renewable energy zone policy for proactive transmission development. Chairman Smitherman is a member of the State Bar of Texas, an ex officio board member of ERCOT, secretary/treasurer of RSC for the Southwest Power Pool, a member of the ERE Committee at NARUC, and served as one of 30 members of the DOE inaugural Electricity Advisory Committee. For 16 years he was a public finance investment banker working with state and local governments throughout the South, Southwest and Midwest. Chairman Smitherman has also been a prosecutor with the Harris County District Attorney's office. He graduated from Texas A&M University, receiving a BBA summa cum laude. He received his JD from the University of Texas School of Law, and an MPA at Harvard University.

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Cost Recovery and the Smart Grid: The Texas Experience

Barry T. Smitherman

Chairman, Public Utility Commission of Texas

September 17, 2010

Smart Meter Support

- The Texas Legislature recognized the benefits that can accrue from smart meters, expressly supporting the deployment of smart meters in Texas, and directed the PUCT to develop a non-bypassable surcharge to recover costs associated with the deployment of smart meters.
- HB 2129 (2005): “In recognition that advances in digital and communications equipment and technologies, including new metering and meter information technologies, have the potential to increase the reliability of the regional electrical network, encourage dynamic pricing and demand response, make better use of generation assets and transmission and generation assets, and provide more choices for consumers, the legislature encourages the adoption of these technologies by electric utilities in this state.”
 - “The commission shall establish a nonbypassable surcharge for an electric utility or transmission and distribution utility to use to recover reasonable and necessary costs incurred in deploying advanced metering and meter information networks to residential customers and nonresidential customers”

Further Smart Meter Support

- HB 3693 (2007): “[I]t is the intent of the legislature that net metering and advanced meter information networks be deployed as rapidly as possible to allow customers to better manage energy use and control costs, and to facilitate demand response initiatives.”

Smart Meter Rulemaking

- Project No. 31418: Adopted May 10, 2007, PUC Rule 25.130
 - Set the functionality requirements for smart meters and process for cost recovery.
 - “The commission concludes that a minimum threshold of technical capability of advanced meters should be met in order to receive cost recovery under the surcharge mechanism.”
 - “The commission agrees...that in order for advanced meters to qualify for the surcharge, those meters should provide all of the benefits intended by the statute and rule. The commission also agrees...that minimum standards should be set for customers to benefit from AMI in the most cost-efficient manner.”
- Smart Meter functionality set out in 25.130(g), includes:
 - automated or remote meter reading,
 - two-way communications,
 - remote disconnection and reconnection,
 - the capability to provide direct, real-time access to customer usage data,
 - means by which the REP can provide price signals to the customer, and
 - the capability to provide 15-minute or shorter interval data

Smart Meter Deployment

- Docket No. 35718, Oncor
 - Oncor estimated a total capital investment of \$686 million, operating and maintenance expenses of \$153 million, and estimated savings of \$176 million of meter reading savings and \$28 million of ad valorem tax savings.
 - Cost to residential customers of \$2.21/month.
- Docket No. 35639, CenterPoint
 - CenterPoint estimated a total capital investment of \$639.6 million, operating and maintenance expenses of \$207.9 million, and estimated savings of \$120.6 million.
 - Cost to residential customer of \$3.24 for 2 years, then \$3.05/month.
- Docket No. 36928, AEP
 - AEP estimated a total capital investment of \$269.71 million, operating and maintenance expenses of \$159.77 million, and estimated savings of \$121.76 million.
 - AEP TCC: \$3.15/month for two years, \$2.89/month for next two years, then \$2.26/month for remainder of surcharge period.
 - AEP TNC: \$3.15/month for two years, \$2.77/month for next two years, then \$2.35 for remainder of surcharge period.
- Docket No. 38306, TNMP: Filed on May 26, 2010 (Ongoing)

Smart Meter Deployment

- As of July 31, 2010, over 1,700,000 smart meters have been deployed in ERCOT. Over 6 million smart meters will be deployed by the end of 2013.
 - Oncor: 1,165,035
 - CenterPoint: 527,771
 - AEP: 48,929
- The joint web portal, www.smartmetertexas.com, is used by consumers, REPs, and TDUs to track and manage energy use.
- Consumers can use the information provided by smart meters to help reduce their energy use and take part in new pricing or demand response programs.
- Several REPs are offering products and services that utilize smart meter functionality, such as energy monitoring, time-of-use pricing, or pre-paid service.
- A recent Rolling Stone article lists smart meters as a “sure bet” of ways to “cool the planet.”

Independent Testing of Smart Meters

In response to complaints that smart meters were over-charging customers, the PUC contracted with Navigant Consulting to evaluate smart meters deployed by Oncor, Centerpoint Energy, and AEP Texas. (PUC Project No. 38053)

- Meter testing:

- Bench testing of 2000 “new inventory” pre-deployment smart meters and 2000 “deployed (ACTIVE) smart meters” for accuracy review and mobile field testing of smart meters that are currently in service in the Oncor service territory for accuracy review.

- Side-by-Side testing of 75 deployed (ACTIVE) smart meters (25 Oncor, 25 CenterPoint, 25 AEP) removed from service tested against 75 deployed (ACTIVE) conventional meters (i.e., electromechanical) for accuracy and testing approximately 50 meters at a time (25 smart meters and 25 conventional meters) in an environmental chamber.

- Navigant also:

- Reviewed historic customer usage.

- Analyzed customer complaints.

- Evaluated utility smart meter processes, procedures and controls involving system hardware and software.

- Tracked the accuracy of information transmitted from a smart meter to its final destination (meter-to-bill).

- Sampled customer (conventional meter) usage to compare information and identify any inconsistencies with customer accounts that have smart meters.

- Conclusion:

- The study concluded that smart meters are more accurate than traditional electromechanical meters, finding 2 inaccurate smart meters out of 5,627 tested, for an **accuracy rate of 99.96%**. The study also identifies ways for the transmission and distribution utilities to ensure more accuracy in data communications.

Questions?

For this and other presentations, go to

<http://www.puc.state.tx.us/about/commissioners/index.cfm>

and follow the link for Chairman Smitherman.



Dr. John Anderson is President and CEO of the Electricity Consumers Resource Council (ELCON). He joined ELCON in 1980 and was named Executive Director in 1984. ELCON represents large industrial electricity consumers. Its member companies come from virtually every sector of the manufacturing community. Many ELCON members cogenerate some of their electricity requirements. Dr. Anderson has presented papers and spoken extensively on a wide range of electricity issues of importance to large industrial firms. He holds both MS and PhD degrees from the University of Florida with concentration in public utility and industrial organization.

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The Smart Grid: A Consumer's Thoughts

A presentation by:

**Dr. John A. Anderson, President & CEO
Electricity Consumers Resource Council
(ELCON)**

Washington, D.C.

At the:

**Smart Grid Today Web Conference
September 17, 2010**



What Is ELCON?

- The national association for large industrial users of electricity in the U.S.
 - Founded in 1976
 - Members from a wide range of industries from traditional manufacturing to high-tech
- ELCON advocates
 - An adequate and reliable supply of electricity at competitive or reasonable prices for all electricity consumers
- The views today are mine alone



Where Does ELCON Stand RE: The Smart Grid?

- In my more than 30 years advocating for industrials on electricity issues
 - I have never observed any US President talking so explicitly and fervently about any electricity issue as President Obama talks about the smart grid
- Thus, we feel that there must be something real behind this issue
 - And therefore we are monitoring very carefully smart grid developments and its implementation



Smart Grid Benefits

- A DOE brochure lists the benefits of the smart grid as (my emphasis):
 - ❑ Ensuring its reliability to degrees ***never before possible***
 - ❑ Maintaining its affordability
 - ❑ Reinforcing our global competitiveness
 - ❑ ***Fully accommodating*** renewable and traditional energy sources
 - ❑ Potentially reducing our carbon footprint
 - ❑ Introducing advancements and efficiencies ***yet to be envisioned***
- ❑ With such claims, it is not surprising that the smart grid is getting so much attention



Smart Grid Benefits (cont.)

- I fully understand that certain parties will benefit including:
 - Vendors – Will sell goods and services
 - Utilities – May see their rate base increased
 - Environmentalists – Think that emissions will be reduced
- But there obviously is a disconnect
 - Increasingly, end-use consumers are expressing concern – if not outright opposition



Consumer Concerns

California

- PG&E plans to install 10 million smart meters by 2012
 - However, PG&E has been sued over its meter program by customers who blame the new technology for electric bill overcharges
 - And State Senator Dean Florez (D-Shafter) said that complaints against PG&E's electric rates had been flooding his office
- PG&E for months said that there were no problems
 - But then reversed that stand, released a public apology and issued a 700 page report on the program, what went wrong and how problems are being fixed
- An audit of the program showed that the meters worked as expected
 - However, consumers expressed real concern over higher bills caused by real-time pricing, a very hot summer, and 47.39 ¢/kWh prices in the tail block



Consumer Concerns (Cont.)

Maryland

- The MD PSC said that it believed whole-heartedly in the intentions behind BG&E's proposal for smart meters
- But the MD PSC initially turned down the proposal stating:
 - "The proposal asks BG&E's ratepayers to take significant financial and technological risks and adapt to categorical changes in rate design, all in exchange for savings that are largely indirect, highly contingent and a long way off."
- The MD PSC invited a re-application with three changes:
 - (1) propose a cost recovery mechanism that shares some of the project risk with shareholders, probably through a mechanism such as a regulatory asset;
 - (2) eliminate mandatory time-of-use (TOU) rates; and
 - (3) include a specific consumer education plan
- Upon re-filing:
 - The MD PSC approved a plan that did not require all of the risk to be on the ratepayers
 - Then modified even that plan and required the utilities to demonstrate the cost-effectiveness of the proposals



Consumer Concerns (Cont.)

Colorado

- Xcel Energy's SmartGridCity project in Boulder now costs almost three times the initial estimate.
 - State regulators have stepped in to examine the viability of the project
 - The utility itself is on the defensive, issuing disclaimers that the project is only an experiment
- The city of Boulder initially supported Xcell's bid to recover costs
 - But later withdrew from the PUC proceedings saying that there is not a clear consensus among the members of the Boulder City Council with regard to the value of SmartGridCity in its present state of the prudence of this investment
- The CO PUC agreed not to contest the recovery of \$44.5 million
 - But the Office of Consumer Counsel (and others) will contest that decision stating: "We don't believe ratepayers should be forced to pay for a project that at this point delivers very little value."
- The costs are \$44.8 million for 23,000 homes or \$1,948 per home



Consumer Concerns (Cont.)

Michigan

- In November 2009, the MI PSC said that a smart grid is essential
- However, the MI Attorney General now questions the spending of \$230 million without providing any cost/benefit analysis
 - The AG said that the utility "...has not done the type of detailed cost/savings analysis a reasonable person would expect before expending millions of dollars in study and hundreds of millions more to implement the AMI project."
- A MI Administrative Law Judge stated:
 - "...I have serious concerns about whether the benefits of this project warrant expenditure of a quarter of a billion dollars..."
- More recently, the PSC put pressure on a MI utility to cut its smart grid spending plan nearly in half
 - The PUC says the expenditures would hit the state's already hurting economy with rate increases



Consumer Concerns (Cont.)

Texas

- ❑ The Dallas Morning News reported that “hundreds” of Texans who received smart meters in Oncor’s service territory are complaining about the accuracy of the meters after receiving unusually high energy bills after the meters were installed.
- ❑ Earth2tech reported: “The backlash against the smart meters installed in Texas by utility Oncor doesn’t seem to be dying down. Actually the protesters are getting more organized and turning to social media.”
- ❑ A law suit was filed accusing Oncor of fraud – although that suit has been dismissed by the court saying that the PUC is the appropriate place to bring complaints



Consumer Concerns (Cont.)

Indiana

- ❑ The Indiana Utility Regulatory Commission rejected Duke's initial \$450 million proposal for a complete rollout of the digital, interactive technology across the state
- ❑ The Commission said there were no demonstrable benefits for customers



Consumer Concerns (Cont.)

Virginia

- Howard M. Spinner, economics and finance division director for the VA SCC as quoted in the Richmond Times-Dispatch:
- “The actual benefit value realized by ratepayers will be less than the costs borne by ratepayers. The project is likely to save only 60 percent of the energy claimed by the company.”



Consumer Concerns (Cont.)

Hawaii

- Local consumer advocates have been concerned that the benefits of smart meters hasn't been articulated yet
- The Hawaii PUC, in July, denied Hawaiian Electric Company's request to expand testing of a \$115 million smart grid project
 - Until the utility shows the PUC an expanded smart grid plan that wouldn't use ratepayer money



What Do These Consumer Concerns Mean?

- The concerns to date have been largely expressed by residential consumers
 - Obviously, they will speak for themselves
- And I emphasize
 - Large consumers do NOT oppose a smart grid at this time
 - Who would oppose technology development?



What Do These Consumer Concerns Mean? (Cont.)

- However, industrials are watching carefully the developments
 - Many (most?) already have interval meters and many are already subjected to time-differentiated prices
 - And the claimed “operational benefits” are vague at best
 - So they question what incremental benefits they will receive
- But the costs appear to be very significant:
 - Direct dollar cost estimates of a TRILLION dollars are not uncommon – How much will industrials have to pay?
 - Perhaps of more concern, the cyber security risks may be very high – moving from analogue to digital may bring with it serious confidentiality problems
 - And industrials are adamant that they, not their friendly electricity supplier, control their productive processes



And There Are Alternatives

- ❑ Do we really need a “smart grid” to control peak load?
- ❑ For well over 40 years
 - Utilities have been installing radio-controlled devices on key electricity consuming devices
 - The programs usually are voluntary
 - These devices allow utilities to “dispatch” – or directly control – these appliances
 - This is a proven – and very inexpensive – way to reduce peak load
 - And many customers have been quite pleased with the results



So Where Are We?

- GridWise President Katherine Hamilton recently said:
 - “We have always said that the grid is not really smart unless the consumers are able to be active participants and make decisions on how they use energy.”
- I suggest that consumers must be both ***willing*** and able
 - Not just able



Recommendations

- A cost-effective smart grid may be a terrific idea that brings real, net benefits to consumers
 - But that message has not registered with consumers – either small or large – at least to date
 - To be successful, I assert that consumers must be convinced that the net benefits (benefits that they truly want) outweigh the costs (that are unknown, but thought to be substantial)
- I urge the advocates of a smart grid to:
 - Directly address up front customer concerns
 - Such as costs, mandatory real time pricing, lack of privacy, technological obsolescence, stranded costs, cyber security, etc.)
 - Otherwise, you may find continued and increasing consumer backlash
 - Backlash that may set back smart grid development for a long time



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