T&E COMMITTEE #1
October 25, 2012

Discussion

MEMORANDUM

October 23, 2012

TO: Transportation, Infrastructure, Energy and Environment Committee

FROM: Keith Levchenko, Senior Legislative Analyst

SUBJECT: **Discussion:** Utility 2.0

Committee Chairman Berliner has scheduled a discussion on October 25 with regard to options for the provision and regulation of electricity in the future. Mr. Berliner asked the following participants to present their thoughts regarding potential regulatory and technological innovations that are needed to move the United States' (and Montgomery County's) electric power model into the 21st century.

- John Jimison, Managing Director, Energy Future Coalition
- Kurt Yeager, Vice Chairman, Galvin Electricity Initiative and Boardmember of the Perfect Power Institute
- John Kelly, Executive Director, Galvin Electricity Initiative and Boardmember of the Perfect Power Institute

Pepco officials and County agency staff involved in energy issues have been invited to attend as well.

Some information about the participants is attached on ©21-23. Some information about their organizations is also attached and can be found at the following links:

Energy Future Coalition (©1-3): www.energyfuturecoalition.org
Galvin Electricity Initiative (©4-8): www.galvinpower.org
Perfect Power Institute (©9): www.perfectpowerinstitute.org

Utility 2.0

The term "Utility 2.0" is included in the Weathering the Storm - Report of the Grid Resiliency Task Force released on September 24, 2012. The Executive Summary from the report is attached on

©14-20. The full report is available for download at: http://www.governor.maryland.gov/documents/GridResiliencyTaskForceReport.pdf. This report was initiated by Governor O'Malley and was intended to evaluate the following:

> *1. The effectiveness and feasibility of undergrounding supply and distribution lines;*
> *2. Other options for infrastructure investments to improve resiliency of the grid; and*
> *3. Options for financing and cost recovery for capital investment.*

While the Task Force did not recommend specific infrastructure improvements, it recommended a number of technology, infrastructure, regulatory, and process recommendations. Of particular note is Recommendation #11:

> ***11. Task the Energy Future Coalition with Developing a Pilot Proposal***
> *During the course of the roundtable discussions, there was consensus that the utility industry was transforming at a pace unseen in its history. The Task Force recommends that the Governor formally charge the Energy Future Coalition with scoping out a Utility 2.0 pilot proposal and reporting back to the Governor and the Task Force, by March 15, 2013, on a viable method to explore the contours of the utility of the future.*

Each of the presenters can provide their thoughts on what the major elements of "Utility 2.0" should be and what Montgomery County and the State of Maryland need to do to achieve this goal.

Attachments

- Website Excerpts:
  - Energy Future Coalition (©1-3)
  - Galvin Electricity Initiative (©4-8)
  - Perfect Power Institute (©9)
- Presentation Slides*: Utility 2.0: Perfect Power for Montgomery County by Kurt Yeager (©10-13)
- Weathering the Storm: Report of the Grid Resiliency Task Force (Executive Summary) (©14-20)
- Presenter Biographies (©21-23)

*Additional presentation materials from the other meeting participants may be provided prior to or at the October 25 meeting.

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Energy Future Coalition

search

ABOUT US WHY WE MUST ACT WHAT WE'RE DOING RESOURCES

Our Mission

The **Energy Future Coalition** is a broad-based, non-partisan alliance that seeks to bridge the differences among business, labor, and environmental groups and identify energy policy options with broad political support.

Our Initiatives

Rebuilding America

A campaign to slash energy waste in 50 million homes and businesses. **Join Us.**

>read more

Americans for a Clean Energy Grid

The U.S. needs a national electricity transmission plan to bring renewable resources to market. **Visit ACEG online.**

>read more

Renewable Energy: 25x'25

The 25x'25 vision is for the United States to supply 25%of its energy needs with renewable energy by 2025.

>read more

Spotlight

Change the Rules, Hurry the Future

>read more

Powering our Energy Future

>read more

Unlocking Energy Efficiency Financing

>read more

>read all spotlight entries

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Updates

Maryland Announces Solutions for Improving Reliability of Grid, EFC Tasked to Help

Submitted by Dustin on October 12th, 2012

The deadly derecho of June 2012 is the final straw in causing Maryland to take action on grid reliability and resiliency. The Energy Future Coalition has been asked to help out.

EFC Applauds the Introduction of the "Commercial Building Modernization Act"

Submitted by Patrick on October 1st, 2012

Legislation introduced by Sens. Jeff Bingaman, Olympia Snowe, Ben Cardin, and Dianne Feinstein would improve the structure of the 179D commercial building tax deduction and encourage energy efficiency investments in America's commercial buildings.

EFC Submits Comments in Support of PACE

Submitted by Dustin on September 27th, 2012

The Energy Future Coalition counters the stance of the Federal Housing Finance Agency, whose opposition to an innovative energy efficiency program makes little sense.

EFC Hosts Strategy Discussion with Business Leaders in Ohio

Submitted by Ryan on September 10th, 2012

Energy Future Coalition

Mission
History
Steering Committee
Advisory Council
Strategy and Approaches
Funders
Staff

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- PRIVACY POLICY

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STRATEGY AND APPROACHES

A plan for a new energy future

Strategy and Approaches

The Energy Future Coalition's analysis of past efforts to affect U.S. energy policy found them to be too academic, too narrow, or too sectoral, and for the most part uninformed by practical political experience. The Coalition has focused on practical political coalition building, reaching out to new partners in the business and labor communities and avoiding battles that have been fought in the past, or that clearly divide along partisan lines. The Energy Future Coalition has outlined policy options that are significant in their own right, that will attract the support of important political constituencies, and that will create a compelling response to the three energy challenges driving this initiative:

- The political and economic security threat posed by the world's dependence on oil.
- The risk to the global environment from climate change.
- The lack of access of the world's poor to the modern energy services they need for economic advancement.

From the beginning, the Coalition adopted the following statement of principles to guide its actions:

1. The Coalition will be a diverse, inclusive, and non-traditional partnership of business, labor, nonprofit organizations, and individuals.
2. The Coalition will be non-partisan.
3. The Coalition will encourage policy options that emphasize technological innovation without constraining consumer choice.
4. The Coalition will educate and advocate on the benefits of clean, affordable, and sustainable energy production and use, both in the United States and abroad.
5. The Coalition recognizes that the transition to a new and sustainable energy economy will take years - indeed, decades - to achieve, and will also pursue shorter-term objectives

The Coalition is organizing its public policy initiatives around the following premises:

- America will be constrained by its linkage to the Persian Gulf - and the global economy will be at risk - as long as it depends solely on oil for transportation.
- The U.S. cannot make major reductions in greenhouse gas emissions unless it transforms its use of coal for electricity and oil for transportation.
- The U.S. can lead the way in the development and distribution of new energy technologies that draw on locally abundant resources and that operate cleanly and safely. In so doing, Americans will serve their own security and economic interests and the well-being of people everywhere - stimulating investment opportunities, job creation, and economic growth.
- Energy efficiency is the cleanest and cheapest source of energy for the U.S.

Energy Future Coalition | Contact Us

Phone: 202.463.1947 | Email: info@energyfuturecoalition.org

Office Location: 1615 M St., NW, 7th Floor | Washington, DC 20036

Energy Future Coalition

Transmission

Energy Efficiency

Renewable Energy: 25x'25

Clean Energy Development

Partnerships

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WHAT WE'RE DOING

The Energy Future Coalition's strength is its ability to bring together diverse stakeholder groups to effect meaningful change in the energy sector. From its inception, the Coalition has built successful partnerships to promote clean energy, developed innovative business approaches to reduce greenhouse gas emissions, and promoted high-level stakeholder engagement in the clean energy sector, as described further below.

Initiatives

Rebuilding America

Energy efficiency is a golden opportunity for the United States to embark on a new clean energy path in a way that boosts the economy, creates jobs, and helps the environment at half the cost of building new power plants. But we need to change the rules to incentivize energy efficiency to make it the first fuel of choice. Learn how the Energy Future Coalition's Rebuilding America initiative is working to upgrade the energy efficiency of 50 million buildings by 2020.

Americans for a Clean Energy Grid

The U.S. power grid—our system for moving electricity from power plants to homes and offices—needs to be digitized and modernized. Revamping the grid should be a national priority to enhance its security, enable large-scale renewable energy deployment, and reduce efficiency losses. Learn more about how national, state, and local policies can bring about an expanded, secure, efficient, and intelligent electric power grid.

Renewable Energy: 25x'25

America's farms, forests, and ranches can provide 25% of America's energy by 2025. Renewable energy can reduce our use of imported oil, is better for the environment, and creates new jobs in rural and manufacturing communities. Learn how plants can be turned into transportation fuels, how the sun can power homes, and how wind is already making a difference in states like Texas and Florida.

Sustainable Energy For All

Access to sustainable energy for all is essential for strengthening economies, protecting ecosystems, and achieving equity. In fact, more than 1.4 billion people worldwide have no access to electricity, and 1 billion more only have intermittent access. At the same time, other parts of the world have a chance to radically alter how much energy they consume and how efficiently they use it. The Energy Future Coalition is working with the United Nations Foundation and United Nations Secretary-General Ban Ki-moon to extend energy's reach in order to combat endemic poverty. This initiative will call for private sector and national commitments and attract global attention to the importance of energy for development and poverty alleviation. The goal is to meet three objectives by 2030:

- Ensuring universal access to modern energy services.
- Doubling the rate of improvement in energy efficiency.
- Doubling the share of renewable energy in the global energy mix.

In recognition of the importance of energy access for sustainable economic development and supporting achievement of the Millennium Development Goals, the United Nations General Assembly has designated 2012 as the International Year of Sustainable Energy for All.

GALVIN ELECTRICITY INITIATIVE
Sponsored by The Galvin Project, Inc.
Perfecting Power for a Secure, Sustainable Energy Future

Introduction to the Galvin Electricity Initiative

The Galvin Electricity Initiative is leading a campaign to transform our nation's power system into one that truly meets our needs for reliable, efficient, clean electricity service. The imperfect quality of power service today robs each American household of thousands of dollars a year, and the transformation of service quality to 21st century digital standards is critical to resolving the serious economic and environmental threats facing our nation. The Initiative believes that these threats can only be resolved if we shift to a new industry paradigm that is consumer-centric and driven by entrepreneurial innovation and smart technology.

Suggested reading for more information about the Galvin Electricity Initiative:

The Essence of the Galvin Electricity Initiative
This fact sheet details the background of the Initiative, the challenges facing our electricity grid, and the Initiative's vision of the opportunities ahead of us.

Bob Galvin's Recipe for Transforming the Electricity Sector
This fact sheet details Bob Galvin's vision for the future of the electricity sector, focusing on the thinking and philosophy that drives the Initiative's work.

Power to the People: Electricity Consumer Principles
This fact sheet is a foundational document for the Initiative, reflecting our belief that reforms to the electricity sector should focus on empowering consumers.

IN THE NEWS...

PPI is currently looking for participants to help develop Version 1 of the Perfect Power Seal of Approval

Kurt Yeager To Moderate "Big Data Management for Energy and Smart Grid" Event

Perfect Power Institute™ white paper featured in Smart Grid Today

Perfect Power Institute™ releases new white paper exploring the business case for grid modernization

more

The Essence of the Galvin Electricity Initiative

Transforming the Grid: An Executive Summary

Aging, unreliable, inefficient, insecure and incompatible with the needs of a digital economy, the U.S. electric system is in dire need of modernization. With technology that pre-dates the 1950s, the system includes decades-old equipment on the verge of failure. While these parts can and will be replaced, the situation presents the nation with an unprecedented opportunity – a chance to also reinvent and change America's electric grid in ways that are profoundly beneficial to consumers, the environment and the economy. Founded by former Motorola Chairman and CEO Robert Galvin, the Galvin Electricity Initiative is a catalyst for this transformation.

The first objective of the Initiative is to promote regulatory reform, based on a guiding set of **Electricity Consumer Principles** (see page 4). Current regulations set incentives for utilities to maximize the amount of power they produce and sell, with no real rewards for reliability, customer service, innovation or resource conservation. Since regulations that protect the status quo also effectively prohibit the introduction of technologies that would enhance the grid's performance, reform is a vital initial step.

The Initiative's second objective is to support projects that concretely demonstrate the benefits of regulatory change, incorporating technologies already in existence into smart microgrid electricity distribution systems, using Six Sigma quality principles not often employed by the industry. Designed to augment the bulk electricity grid and improve the quality, reliability and security of service, such interactive microgrids – small, modernized versions of the bulk power grid – comprise what the Initiative calls the Perfect Power System. A working example of Perfect Power is now under development in Chicago, at the campus of the Illinois Institute of Technology.

Third, since these impending changes challenge those comfortable with a known system, communications on the advantages of Perfect Power are critical to reform. The Initiative's advocacy efforts are focused on influential state and federal stakeholders, as well as others in a position to lead policy change.

The existing grid served the U.S. well for much of the 20th century. Its hardware and the people who operate it will continue to deliver power to end-users into the future. The industry, however, has failed to spawn significant innovation in more than 50 years, largely due to a regulatory structure not attuned to the needs of the 21st century. The essence of the Galvin Electricity Initiative, then, is to stimulate entrepreneurial innovation and investment aimed at providing consumers with choices, while removing barriers that prohibit a value transformation of the electricity system.

The Challenge

Electricity is one of the few sectors where performance and earnings are not directly aligned with the interests of consumers or their satisfaction. Instead, utilities answer primarily to state regulatory agencies, elected officials and federal authorities, operating under numerous rules that precede the New Deal. But like many elements of the U.S. infrastructure, much of the equipment in the electricity grid is near the end of its functional lifespan. We therefore face a choice of reinvesting in a system that served the past, or transforming it in ways that serve the consumers, businesses and society of tomorrow.

The case for change is clear. Consider, for instance, the unreliability of today's grid. Despite great efforts by utilities to improve reliability, each day roughly 500,000 Americans spend at least two hours without electricity. Brownouts, power spikes and even minor blips can bring high-tech production lines to a halt. Such impurities and failures cost business and consumers an estimated $150 billion a year. Moreover, the system is vulnerable to terrorist attack, major storms and even moderately turbulent weather.

The system is also inefficient. While nearly half of America's electricity comes from coal-fired generation plants, more than 60 percent of the energy in each ton of coal is lost through smokestacks and cooling towers in the form of emissions, heat and warm water. When electricity from coal, nuclear or hydroelectric plants is moved long distances over transmission lines made from copper cables – just like a century ago – still more power is lost as heat, at times up to 10 percent. In homes, telephone chargers and "instant-on" televisions bleed power even when not in use, devouring an average of 7 percent of a household's total consumption. In some cases, more than 90 percent of the thermal units that go into electricity never light a room or run a motor.

The inefficiency in turn contributes greatly to electricity's environmental impact. Power plants produce more pollution than any other single industry, and more carbon dioxide than the entire transportation sector. What's more, nearly a quarter of the total investment in power generation is devoted to providing electricity for peak periods of demand, which occurs 5 percent or less of the time.

Today's electricity industry is much like the old telephone system, when rotary-dial phones came only in black and were owned by the phone company and rented to consumers who legally had no other option. In most jurisdictions microgrids are currently illegal, simply because utilities hold an exclusive right to string wire across roads. Utilities are compensated with a fixed return on how much they invest in facilities to meet maximum power demand, charging consumers for the average cost of providing power. But there are no incentives to give consumers information on costs or choices of when and how much power to use.

The Opportunity

Just as regulatory change created a consumer-focused telecommunications industry, it stands to reason that a reformed electricity regulatory structure will produce similar results. In fact, many of the technologies needed to meet 21st century power demands already exist. Founded on Six Sigma quality methods and researched and designed by a team of industry experts, the Perfect Power System features local power generation from renewable and other distributed sources, including solar panels, generators,

batteries and un-used hybrid automobiles. It incorporates smart in-home devices and meters and a self-sustaining infrastructure with smart switches, which ensure reliability and efficiency.

Such microgrids may encompass a building complex, a campus or an entire community, with power managed by smart controllers. Owned by a town, a third party or a utility, a microgrid can interact with dozens more, woven into a collective that increases systemic strength. Smart controls can instantly identify and isolate a fault, so that customers no longer experience power outages. With dynamic price information provided in real time, the system enables users to control power use and spending. Consumers who produce or store excess electricity – say from solar panels or an electric vehicle – can sell power back into the grid. Estimated annual savings from a smart microgrid can exceed installation costs by a factor of four to five.

Operating in concert with the bulk power grid, a network of microgrids will enable the system to efficiently re-route power and smooth out the spikes of peak demand. In turn, this reduces or eliminates the need to build more conventional plants to meet demand. Under a regulatory transformation, utility and private investment will shift from expanding the system to optimizing its performance, expediting alternative and renewable power development and creating new green job opportunities.

The campus-wide Perfect Power System at Illinois Institute of Technology (IIT) in Chicago – the first such system built in the U.S. – is the Galvin Initiative's flagship project. It's the result of collaboration among the Initiative and IIT; Commonwealth Edison and its parent company Exelon; Endurant Energy, an entrepreneurial energy developer; and S&C Electric Company, which is a global provider of electric power systems. The IIT system is designed to pay for itself as it's built, over a period of nearly five years. The U.S. Department of Energy recently joined the effort, providing $7 million to further condense the payback period while contributing to a cutting-edge prototype for nationwide grid modernization.

The Galvin Approach

Driving Regulatory Reform: The Initiative is researching and promoting new regulatory structures that will facilitate and accelerate the transformation of America's electricity system to a more consumer-driven, entrepreneurial, distributed-service enterprise, while ensuring that regulations are accountable to the **Electricity Consumer Principles**. The Initiative is supporting several states in this effort. In Illinois, the Initiative has convened a Team of Leaders, including local councils of government, to establish guiding principles designed to produce consumer-focused policy changes. The Initiative is also providing technical and analytical support to local communities and consumer groups in their efforts to draft and pass state legislation. The Initiative will showcase this work for use by other states and the federal government.

Developing Perfect Power Systems: Smart microgrids initially built to serve communities and smaller entities offer the most effective architecture for new regulatory structures, technologies and systems. Ongoing demonstration projects also create opportunities for entrepreneurial innovation and electricity service optimization, especially when based on a commitment to quality. The Initiative is creating a utility-focused Six Sigma education program at the University of Minnesota's Juran Center

for Leadership and Quality. The Initiative has meanwhile completed two Perfect Power system designs, one at IIT and another for the Forest City Ratner Mesa del Sol development in New Mexico. A variety of other community-level microgrid projects are now being designed and installed by entrepreneurial innovators.

Raising Awareness: Communications that promote regulatory reform and Perfect Power to influential national and state-level audiences are critical to the Initiative. With messages that reveal the unsustainable costs of maintaining the status quo, the communications also demonstrate the economic, social and environmental rewards of changing the current regulatory structure and culture. The campaign consists of earned media, national and local advertising, speaking engagements and personal outreach to key stakeholders.

Electricity Consumer Principles

These principles reflect the desire to establish a much more consumer responsive, reliable and environmentally responsible electricity system. Developed with citizens, mayors, the business community and other stakeholders, these Principles provide an electricity consumer's "bill of rights," a template for evaluating existing and proposed electricity policies and legislation. The following precepts are designed to guide policy making today and help future generations adapt to changing circumstances:

1. **All electricity consumers have the right to receive dynamic electricity pricing**, and the means and incentives to use this information to their best advantage.
2. **All electricity consumers have the right to buy their retail electricity services from any source they choose** in open, competitive markets.
3. **All electricity consumers have the right to electricity service system reliability and quality** that protects life and safety under all conditions, and meets the needs of today's digital society.
4. **All electricity consumers have the right to access, at all times, the fully transparent performance metrics** of their electricity service system.
5. **All communities have the right to improve their electricity distribution system**, with the full cooperation of their utility, in order to best serve the needs of their citizens.

About the Institute

The Perfect Power Institute™ (the Institute) is the evolution of the nonprofit Galvin Electricity Initiative. Founded by former Motorola CEO and esteemed leader of American industry Robert W. Galvin, the Initiative was launched following the massive Northeast blackout in 2003. The idea behind the Initiative was that a perfect electric power system — a system that never fails the consumer — is not just possible, but critical to ensuring a strong 21st century economy.

The Institute is a legacy to Bob Galvin's lifelong commitment to making life better for all through innovation, the renewal of businesses and markets, and a pursuit of perfection. An independent nonprofit, the Institute will drive system transformation by gathering and implementing best practices in policy and system design, educating industry stakeholders and setting the standard for evaluating system performance via the Perfect Power Seal of Approval™ (PPSoA) program. Keys to this transformation are investments that produce significant improvements in electric industry performance outcomes, especially those that matter most to consumers. The Institute makes the case for these investments and fosters collaboration among the benefactors of electricity system transformation and the investors, regulators, policymakers, entrepreneurs and developers necessary to realize change.

Establishing standards for evaluating system performance and holding participants accountable is central to the Institute's mission. The Institute administers the PPSoA program, a rating system for the grid that establishes much-needed metrics to empower consumers, businesses, communities and regulators to create dramatically better performance from the power system.

Leadership

The Institute is guided by a board of directors, advisory committees and partners, representing stakeholder groups whose meaningful contributions are necessary to achieve transformation within the electricity industry.

Board of Directors
Executive Advisory Committee
State Advisors
Partners

ADDENDUM
T&E COMMITTEE #1
October 25, 2012

Discussion

MEMORANDUM

October 23, 2012

TO: Transportation, Infrastructure, Energy and Environment Committee

FROM: Keith Levchenko, Senior Legislative Analyst

SUBJECT: **Discussion:** Utility 2.0

Attached is additional information received subsequent to the release of the Council Staff packet for T&E agenda item #1. The attachment includes presentation slides and biographical information from John Kelly, Executive Director of the Galvin Electricity Initiative and Boardmember of the Perfect Power Institute.

Attachments
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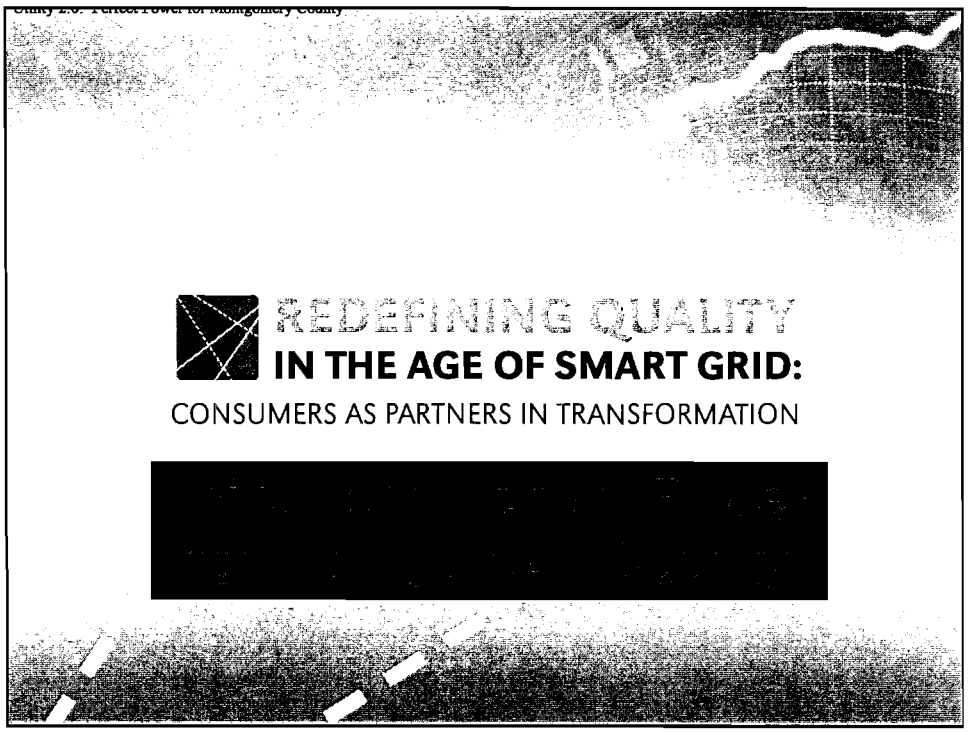
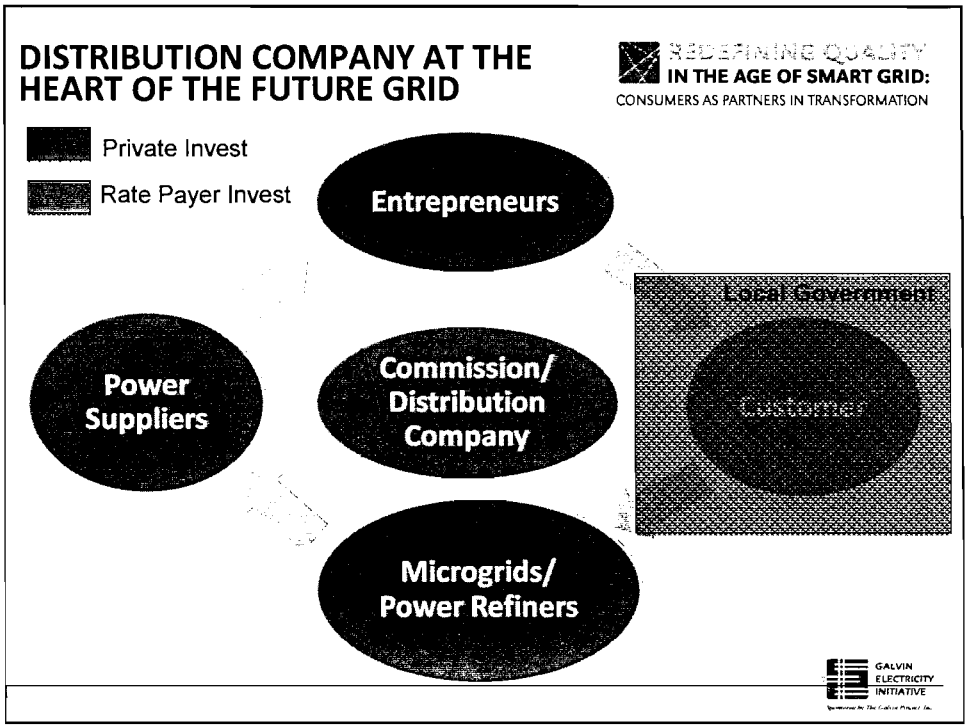

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION


DISTRIBUTION COMPANY AT THE HEART OF THE FUTURE GRID
REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION
Private Invest
Rate Payer Invest
Entrepreneurs
Local Government
Customer
Power Suppliers
Commission/ Distribution Company
Microgrids/ Power Refiners
GALVIN ELECTRICITY INITIATIVE

MEASURING THE GAP

REDEFINING QUALITY IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

FUTURE US GRID

TOTAL GAP ≈ $350 billion

- Reliability and Power Quality losses ≈ $150
- Energy Waste ≈ $70
- Capital Cost Waste ≈ $60
- Emissions Cost ≈ $70

Billion dollars annually

Current Performance

- SAIDI ≈ 240 mins; SAIFI ≈ 1.5 mins
- Energy Waste ≈ 25 quadrillion BTU*
- Carbon Emissions ≈ 2.4 billion tons
- NOx Emissions ≈ 3 million tons
- SOx Emissions ≈ 7 million tons
- Load Factor < 50%

CURRENT US GRID

GALVIN ELECTRICITY INITIATIVE

STATUS OF ELECTRICITY GRIDS

REDEFINING QUALITY IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

Closing the gap produces savings

MICROGRID

Power Refining
- Princeton
- IIT
- UT Austin

UTILITY 3.0

- Naperville
- Chattanooga

Private investment and savings

UTILITY 2.0

Utility investment and savings

CURRENT US GRID

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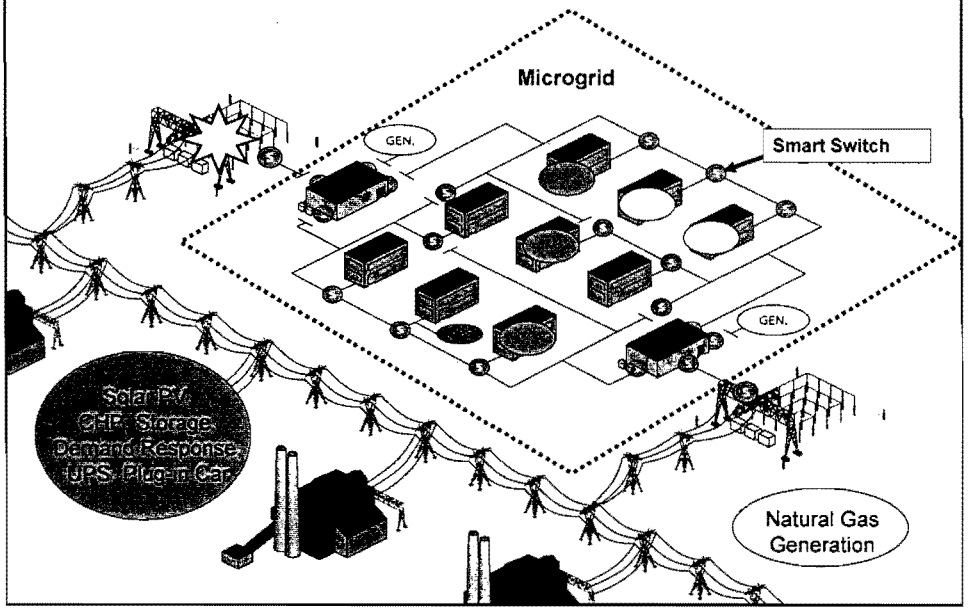
A-2

UTILITY OF 2.0 ELECTRICITY TRANSFORMATION

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

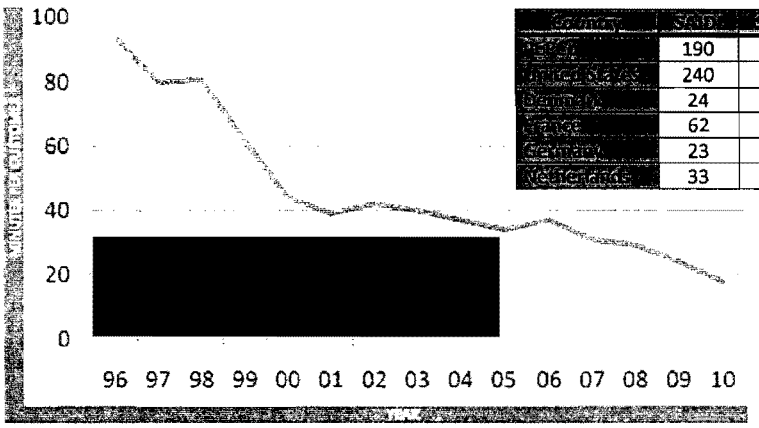


UTILITY INVESTMENT MEASURABLE RESULTS

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

Naperville Outage Duration (minutes) per Customer, 1996 - Present

Outage Duration per Customer in Naperville, 1996 - Present



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[illegible]	33	0.3

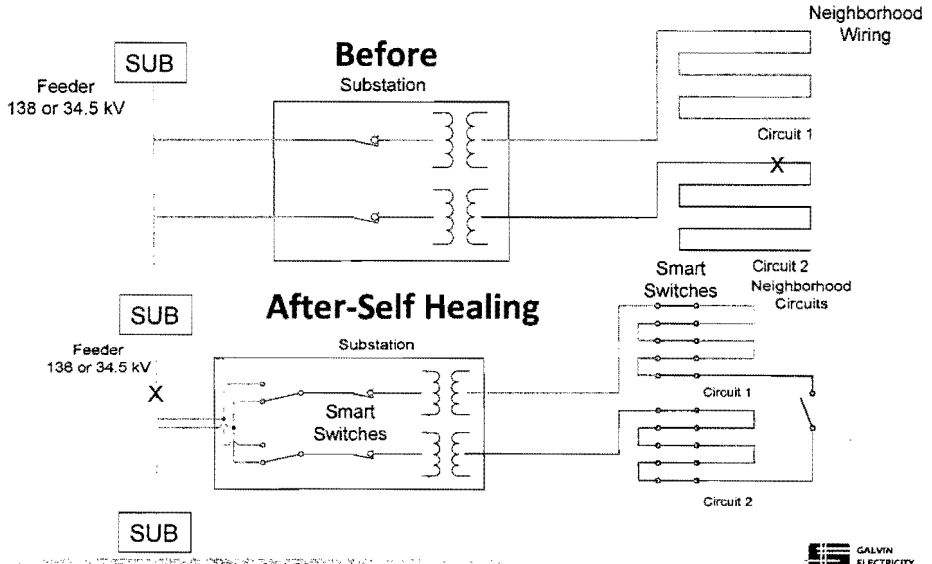
http://galvinpower.org/galvin-conducts-naperville-smart-grid-initiative-case-study

GALVIN ELECTRICITY INITIATIVE

A-3

UTILITY INVESTMENT HOW WILL RELIABILITY BE IMPROVED?

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

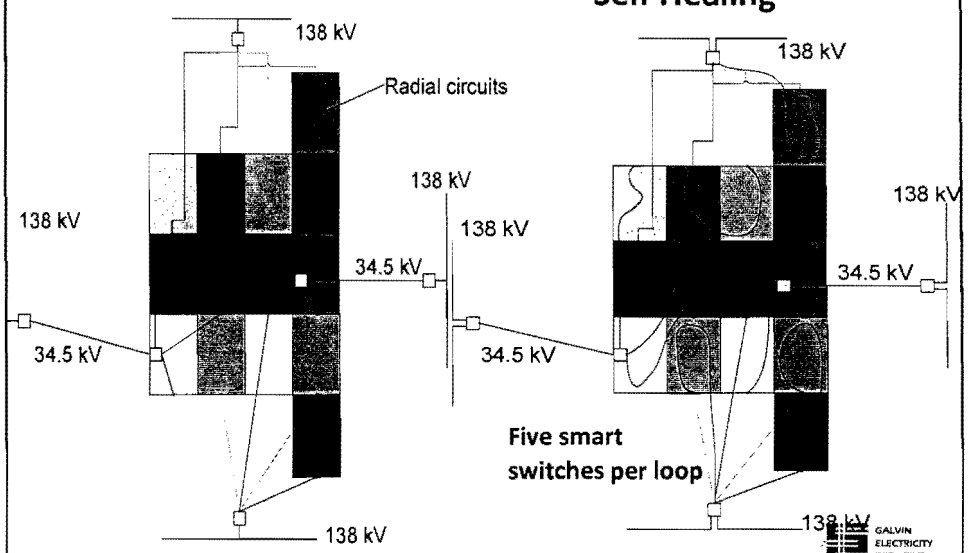


GALVIN ELECTRICITY INITIATIVE

UTILITY INVESTMENT HOW WILL RELIABILITY BE IMPROVED?

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

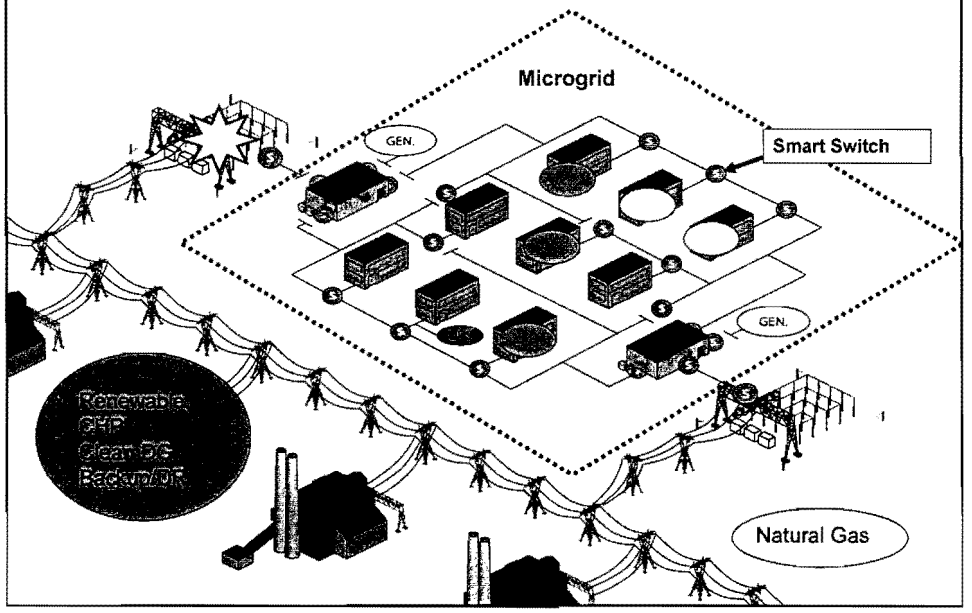
Self Healing



GALVIN ELECTRICITY INITIATIVE

UTILITY OF THE FUTURE
ELECTRICITY TRANSFORMATION

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION



UTILITY INVESTMENT
GETTING MORE OUT OF LIMITED $

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

- Joint County, Utility, Commission design and plan
- Leverage county resources
  - Coordinated tree trimming
  - Conduit installed with new sewer, roads, alley work
- Rider for new development
- Relook at focus on worst circuit
- Utilize private investment

GALVIN ELECTRICITY INITIATIVE

ROLE OF PRIVATE INVESTMENT

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

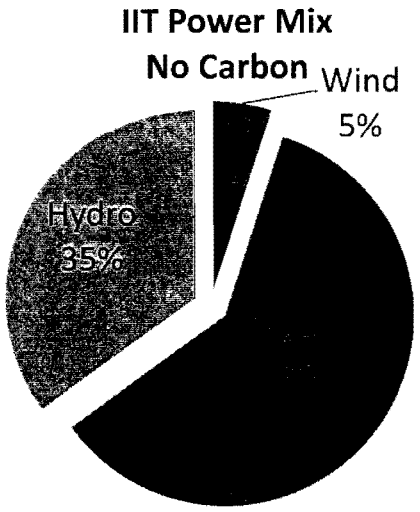
- Power suppliers
  - Carbon free power
  - Financed solar
  - Financed back-up generators tied to real-time
- Microgrids
  - Ice storage for load shifting
  - Power quality refining
  - Island capability
- Entrepreneurs
  - Home automation for demand response and EE
  - Financed permanent EE
  - Virtual home inspection and failure detection

GALVIN ELECTRICITY INITIATIVE

PRIVATE INVESTMENT POWER SUPPLIER

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

IIT Power Mix

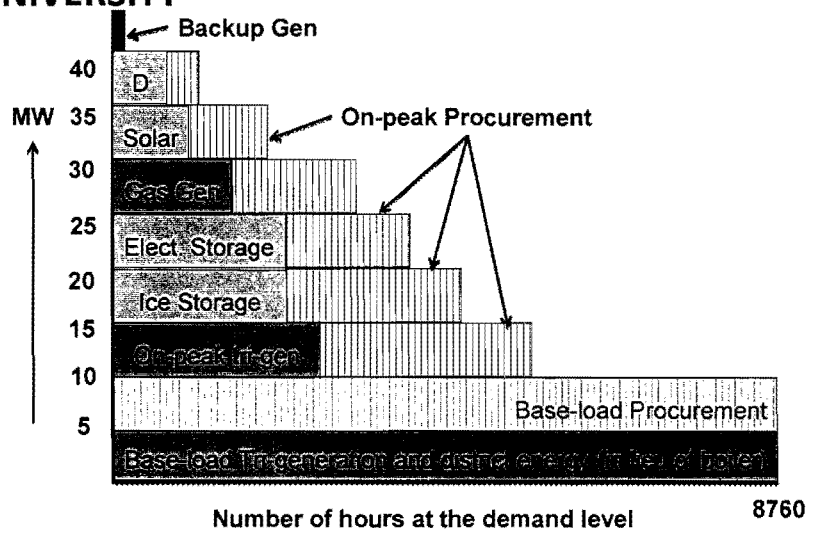


MARIN ENERGY AUTHORITY POWER CONTENT LABEL		
RESOURCES	MEA	2008 CA
Eligible Renewable	27%	2%
Large Hydroelectric	46%	18%
Natural Gas	12%	42%
Coal	10%	33%
Nuclear	1%	5%
Other	3%	0%
TOTAL	100%	100%

ELECTRICITY INITIATIVE

PRIVATE INVESTMENT MICROGRID AT PRINCETON UNIVERSITY

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION



GALVIN ELECTRICITY INITIATIVE

Private Investment Entrepreneur

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

Pecan Street Consortium

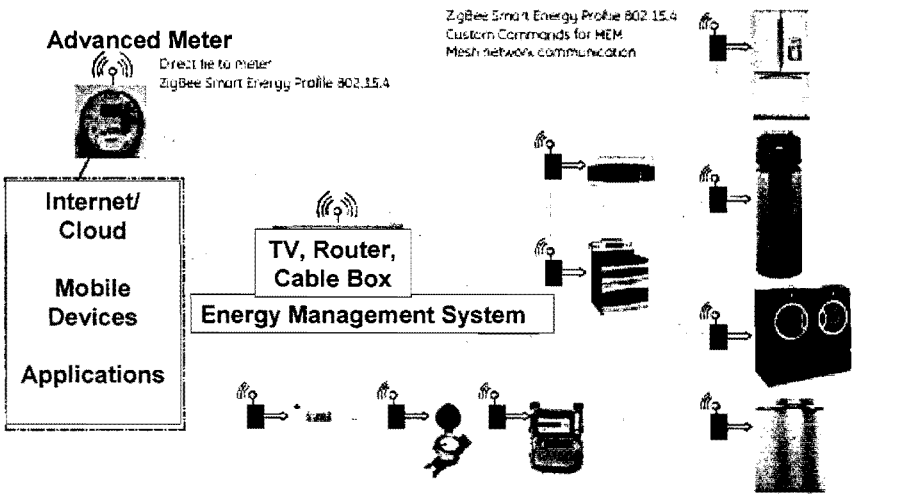
BEST BUY
freescale semiconductor
intel
Landis Gyr+ manage energy better
LG
ONCOR
ORACLE
SONY
SunEdison simplifying solar
Texas Gas Service
Whirlpool

GALVIN ELECTRICITY INITIATIVE

HOME AUTOMATION

REDEFINING QUALITY IN THE AGE OF SMART GRID:

H2G – Home Energy Manager / DR 2010



ELECTRICITY INITIATIVE

ACT AND INVEST IN WHAT?

REDEFINING QUALITY IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

- Conserve to save money and energy
- Flatten load curve to lower costs for everyone
  - Leveraging technology
- Provide grid services in return for payments
  - Demand response, voltage support, VAR's, capacity
- Install renewable and cleaner more efficient power to meet peek demand
- Recycle waste heat to generate power as a (turbine in lieu of a boiler)
- Improve local reliability and power quality

GALVIN ELECTRICITY INITIATIVE

CONCLUSION

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

- The Governor's proposal to conduct a pilot is a sound approach and unique
- Never before have a local government and industry team of leaders assisted the local utility and commission with designing a demonstration to:
  - optimize customer value,
  - maximize utility smart grid outcomes (e. g . reliability),
  - leverage county resources, and
  - maximize private investment.

GALVIN ELECTRICITY INITIATIVE

REFERENCES

REDEFINING QUALITY
IN THE AGE OF SMART GRID:
CONSUMERS AS PARTNERS IN TRANSFORMATION

- Investing in Grid Modernization: The Business Case for Empowering Consumers, Communities, and Utilities; http://www.perfectpowerinstitute.org/sites/default/files/Investing%20in%20Grid%20Modernization.pdf
- Naperville Case Study; http://www.galvinpower.org/transforming-grid/perfect-power-systems/illinois/naperville
- Electricity Reliability: Problems, Progress, and Policy Solutions; http://www.galvinpower.org/sites/default/files/Electricity_Reliability_031611.pdf
- Illinois Electricity System: Guiding Principles and Policy Framework; http://www.galvinpower.org/sites/default/files/Illinois%20Electricity%20System%20Guiding%20Principles%20and%20Policy%20Framework.pdf
- IIT Prototype Report; http://www.galvinpower.org/sites/default/files/documents/IIT_Perfect_Power_Prototype.pdf

GALVIN ELECTRICITY INITIATIVE

John Kelly, *Principle*
Intelligent Power Partners and Acting Executive Director for the Galvin Electricity Initiative
Phone: (630) 464-7020 email: Jkelly@ippconnect.com or jkelly@galvinpower.org

John Kelly has worked with Bob Galvin for the past six years to research and create innovative approaches to transform the electricity system. This includes developing new governance models that will catalyze investment that produces outcomes that matter to consumers. He developed innovative Perfect Power prototypes that demonstrate the art of the possible in terms of consumer requirements – cost efficiency, reliability, conservation, and environment. These prototypes are being designed to serve as replicable models of new system designs that create a competitive advantage for cities and business.

In 2011, Mr. Kelly developed a new performance rating system for the grid modeled after LEED, a green building certification. Known as The Perfect Power Seal of Approval™ it provides a standard set of performance measures and design criteria for assessing the performance of microgrids and smart grids. These metrics draw from six sigma continuous improvement methods and reflect the Initiative's research into consumer's needs and goals. www.galvinpower.org/sealofapproval

As author of numerous studies and research papers, Mr. Kelly has focused on electricity reliability, smart grid cost benefit and state policy reform best practices. He recently assisted in the formation and is a board member of LEAN US, a non-profit dedicated to expanding community choice aggregation nationwide. This innovative policy reforms empowers cities to pursue competitive, clean, and efficient power supply for their residents and small businesses. www.leanenergyus.org

For 30 years Mr. Kelly has provided consulting services to the electric and natural gas industries. For the past decade he has focused on developing innovative, sustainable energy models and designs for cities, large multiuse developments and microgrids. This experience includes developing new consulting practices for Sargent and Lundy, Duke Engineering, and the Gas Technology Institute as well as co-founding Endurant Energy and Intelligent Power Partners.

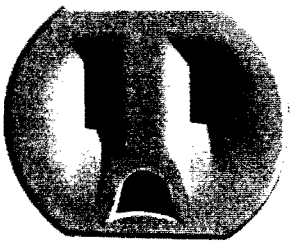
Mr. Kelly received a Bachelor of Science in Energy Engineering from the University of Illinois, Chicago, and a certificate in Environmental Engineering from the Illinois Institute of Technology. In addition, he has completed studies in electricity restructuring. He has been a featured speaker on sustainable development, smart grids, microgrids, consumer empowerment, utility restructuring, district energy, distributed energy, and energy markets. He is a founder of the National Energy Center for Sustainable Communities (www.necsc.us), and is also one of the founders and past treasurer of the Midwest Energy Efficiency Alliance (www.mwalliance.org).

A-10

Utility 2.0: Perfect Power for Montgomery County

Kurt Yeager
Vice Chairman
Galvin Electricity Initiative
10/25/12

Meet Sad Socket



You'd be sad, too, if you had to power **digital-age** businesses on **1950s technology**

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GALVIN ELECTRICITY INITIATIVE

"America cannot build a 21st Century Economy with a 20th Century Electricity System"

Value Being Lost to the U.S. Economy
($ billion per year)

- **Unreliability — 150**
- **Inefficiency — 100**
- **Productivity Penalty — 500+**

Annual Cost to Correct — 25

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GALVIN ELECTRICITY INITIATIVE

Growing Utility Frustration

"It's all about the customer today and we know very little; and we lack regulatory incentive."

"Customer price transparency is the key with education and automation."

"Our infrastructure and policies are legacies of the 1930s."

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GALVIN ELECTRICITY INITIATIVE

Intelligent Grid

A truly intelligent grid system creates a fully integrated power distribution network that diagnoses and resolves problems as they arise and enables real time exchange of information and energy between the utility and its customers.

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GALVIN ELECTRICITY INITIATIVE

Gaining Customer Acceptance

- **ENGAGE** through dynamic rates, technology and education
- **MOTIVATE** through savings and automated control
- **DELIGHT** through easy, enjoyable, fulfilling experiences

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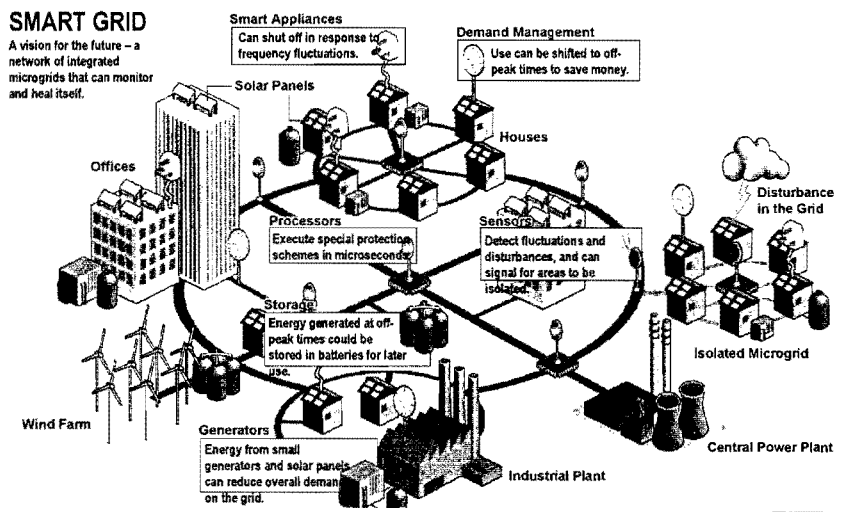
GALVIN ELECTRICITY INITIATIVE

Enable the Future

Integrate microgrids, renewable generation and storage resources into a smart self-healing grid system



Source: Interview with Massoud Amin, "Upgrading the grid," *Nature*, vol. 454, pp. 570-573, 30 July 2008

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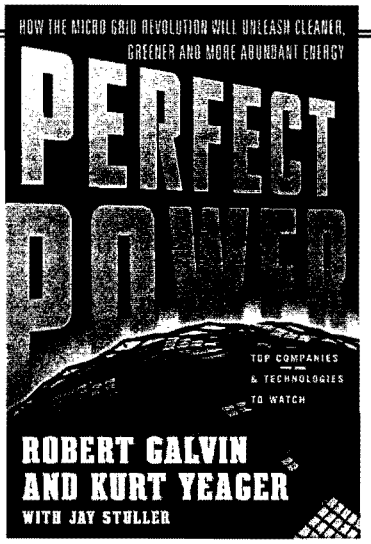
GALVIN ELECTRICITY INITIATIVE



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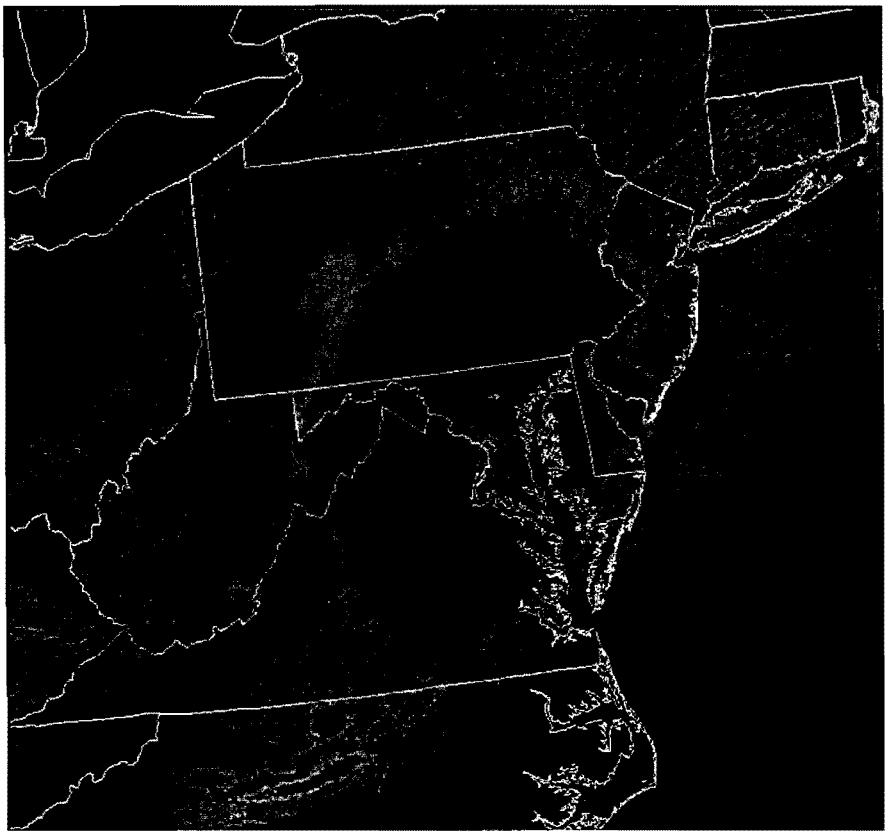
GALVIN ELECTRICITY INITIATIVE

WEATHERING THE STORM

Report of the Grid Resiliency Task Force



September 24, 2012
Office of Governor Martin O'Malley
Executive Order 01.01.2012.15

(14)

I. Executive Summary

On July 25, 2012, Governor Martin O'Malley signed Executive Order 01.01.2012.15 directing his Energy Advisor, in collaboration with identified agencies, to solicit input and recommendations from experts on how to improve the resiliency and reliability of the Maryland electric distribution system. Referencing the potential impact of climate change on regional weather patterns and the prolonged power outages brought by recent hurricanes, blizzards, and the Derecho, the Executive Order specifically charged the Task Force with evaluating:

1. The effectiveness and feasibility of undergrounding supply and distribution lines;
2. Other options for infrastructure investments to improve resiliency of the grid; and
3. Options for financing and cost recovery for capital investment.

Over the past sixty days, the Task Force assembled eight roundtable discussions that included almost 50 experts from around the country, created a website to share information and solicit feedback from the public, analyzed copious data received from the utilities about outage information and staffing levels, synthesized the statutory and regulatory framework in which this conversation takes place, developed eleven recommendations, and drafted this Report. The group's process has been guided, at all times, by the charge of Governor O'Malley's Executive Order: what steps can be taken to strengthen Maryland's electric distribution to better withstand the stresses that come with severe weather events.

To answer this question, the Task Force first had to establish a working definition for reliability and resiliency. In this context, the group defined reliability as the ability of the bulk power and distribution systems to deliver electricity to customer during normal "blue sky" operations. In short, the grid should be able to reliably deliver power as a matter of routine operations. Resiliency was defined as the ability of the distribution system to absorb stresses without experiencing a sustained outage. From these definitions, any improvement that increases grid resiliency will necessarily reduce the frequency of outages during stress events, and may also decrease overall duration of the outage event.

Foundational Principles of the Task Force

The Task Force established several foundational principles that guide its recommendations:

- The current level of reliability and resiliency during major storms is not acceptable.
- Increased reliability and resiliency during major storms is the goal of the Task Force and will inform the recommendations.
- Severe weather events resulting from climate change are likely to continue to occur. It is unacceptable for anyone involved in response efforts to continue to be surprised by the "worst storm" the system or the State has ever seen. Utilities, government and citizens must be prepared for severe weather events.
- If done strategically and appropriately, increased expenditures by the utilities to improve resiliency and harden the gird – to literally ensure that the electric distribution system can

weather the storm – will lead to fewer outages during storms and shorter outages when interruptions happen.

The Task Force considered technological solutions, infrastructure investments, regulatory reforms, and process improvements, and remained always cognizant and focused on cost. It sought information on how much would it cost to make Maryland's system more resilient and insight on how to most appropriately allocate these costs.

With the foundational principles in mind, the Task Force developed a cohesive set of specific recommendations as well as an implementation strategy that maximizes the impact of its recommendations. While some may call attention to certain of the Task Force's recommendations, it is critical to understand that they work best as a unified strategy. The coordinated implementation of the recommendations is as important as the recommendations themselves; if rolled out in an *"a la carte"* manner, they may not produce the expected results.

Recommendations of the Task Force

In light of the Executive Order's charge, the Task Force thought seriously about whether to be proscriptive regarding what infrastructure the utilities should invest in to meet the State's reliability and resiliency metrics, be it at the levels currently outlined in Rule Making 43 ("RM43"), the Maryland Public Service Commission's ("PSC" or "Commission") recent regulatory process to implement changes to the reliability metrics, with the additional metrics proposed for RM43, or on the expedited timetable recommended herein.

After careful thought, the Task Force determined that it would not recommend specific infrastructure improvements. Rather, the Task Force made recommendations that are informed by the foundational principles, guided by the data, and intended to be implemented in a cohesive manner. If followed, the recommendations will logically lead to certain infrastructure investments. This likely will include targeted undergrounding and aggressive tree trimming, as well as improvements in areas that have suffered from repeated outages during storms. In the end, the Task Force created a methodology that would drive investment decisions rather than create a list of improvements to complete.

The following list is a set of specific technology, infrastructure, regulatory, and process recommendations to improve the resiliency of Maryland's distribution grid. They are covered in more detail in Section VI.

1. *Improve RM43's Reliability and Reporting Requirements*

Several recommendations were made to build upon the foundation of the RM43 regulations. Changes included holding utilities responsible for reliability standards inclusive of major storm outages, tightening the poorest performing feeder standard, and providing a simplified major outage event report for public consumption.

2. *Accelerate RM43's March Toward Reliability*

The Task Force recommends accelerating several years' worth of RM43 investments into a condensed timeframe. While the Task Force was intentionally not proscriptive regarding which specific remediation measures should be implemented by the utilities, data collected through the working groups demonstrates that selective undergrounding is an effective way to harden the grid.

3. *Allow a Tracker Cost Recovery Mechanism for Accelerated and Incremental Investments*

The Task Force suggests that utilities advance investment to provide Maryland citizens with a kickstart on the path of improved resiliency. The Task Force also believes it is appropriate to treat the accelerated and incremental investments differently than business as usual investments and recommend the PSC authorize a tracker cost recovery for those selected expenses.

4. *Implement a Ratemaking Structure that Aligns Customer and Utility Incentives by Rewarding Reliability that Exceeds Established Reliability Metrics and Penalizes Failure to Reach Those Metrics*

The Task Force recommends that the PSC implement a performance-based ratemaking structure to align the motivation of the investor owned utility and its customers. This structure should focus on increased reliability as a priority. Under such a rubric, the lenses through which an investor owned utility makes resource allocation decisions could be altered, with increased reliability rising to the top of the competing list of capital expenditure priorities.

5. *Perform Joint Exercises Between the State and Utilities*

As much as the Task Force hopes that outages will be reduced through the implementation of these recommendations, it recognizes that they cannot realistically be avoided entirely in the short or medium term. The Task Force recognizes these emergency management processes can be improved with more collaboration between the utilities and State and local government, and will lead to improved situational awareness that will help all concerned identify, prioritize, and respond to customer needs.

6. *Facilitate Information Sharing Between Utilities, State Agencies and Emergency Management Agencies*

During the roundtables, the Task Force identified numerous opportunities for additional information sharing between the utilities and various State agencies. The purpose of this shared information would be to better prepare the State for an extended outage and to ensure maximum information during an emergency is available to make the State's response as robust as possible.

7. *Increase Citizen Participation In List of Special Needs Customers and Share Information with Emergency Management Agencies*

While many medically vulnerable individuals live in nursing homes or assisted living facilities regulated by the State, many others reside in private residences and depend upon electricity to run their life-sustaining medical equipment. Utilities currently allow these customers to self-identify for service termination purposes, but the Task Force recommends that the utilities work with emergency managers to expand customer registration and share data during outages.

8. Evaluate State-Wide Vegetation Management Regulations and Practices beyond RM43

While the Task Force is cognizant of the critical and positive role that Maryland's tree canopy plays throughout the State, the Task Force is convinced that improved vegetation management is a highly effective way to improve the resiliency of the grid.

9. Determine Cost-Effective Level of Investment in Resiliency

The Task Force recommends that the PSC determine the cost of outages to different customer classes, i.e., industrial, commercial, institutional and residential, and to the Maryland economy in general to determine what level of investment in resiliency improvements is warranted.

10. Study Staffing Pressures Due to Graying of Workforce

The Task Force remains concerned about the long-term plan among all of the utilities to address the challenge of the "graying" utility workforce. The concern specifically arises because the Task Force recognizes that this issue, if left unchecked, may compromise the ability of Maryland utilities to meet enhanced reliability metrics. As such, the Task Force recommends that the PSC conduct an inquiry into the graying of the utility workforce.

11. Task the Energy Future Coalition with Developing a Pilot Proposal

During the course of the roundtable discussions, there was consensus that the utility industry was transforming at a pace unseen in its history. The Task Force recommends that the Governor formally charge the Energy Future Coalition with scoping out a Utility 2.0 pilot proposal and reporting back to the Governor and the Task Force, by March 15, 2013, on a viable method to explore the contours of the utility of the future.

Implementation Strategy

Along with the set of recommendations, the Task Force developed a coordinated implementation strategy. Recognizing the legislation passed by the General Assembly, as well as the months of work necessary to develop the RM43 regulations, this implementation strategy builds upon, and does not supplant, the work that has already been done. The Task Force recommendations are meant to operate within, rather than apart from, the analytic structure mandated by the legislature and adopted by the PSC.

Although each recommendation could work alone, the potential for significant improvement to resiliency would be diminished. This is particularly true for the first four recommendations, which were specifically crafted to work together to accelerate resiliency improvements and provide Marylanders with a tangible benefit in a short period of time.

While the Task Force recognizes that improvements will be realized through the current RM43 regulations, it believes that enhancements to RM43 will further increase resiliency, specifically in the context of major storms. The first recommendation, "Improve RM43's Reliability and Reporting

Requirements," also increases the consistency and accuracy of data, optimizes the utilization of utility resources, and ultimately produces reliability improvements for more customers in a given time frame.

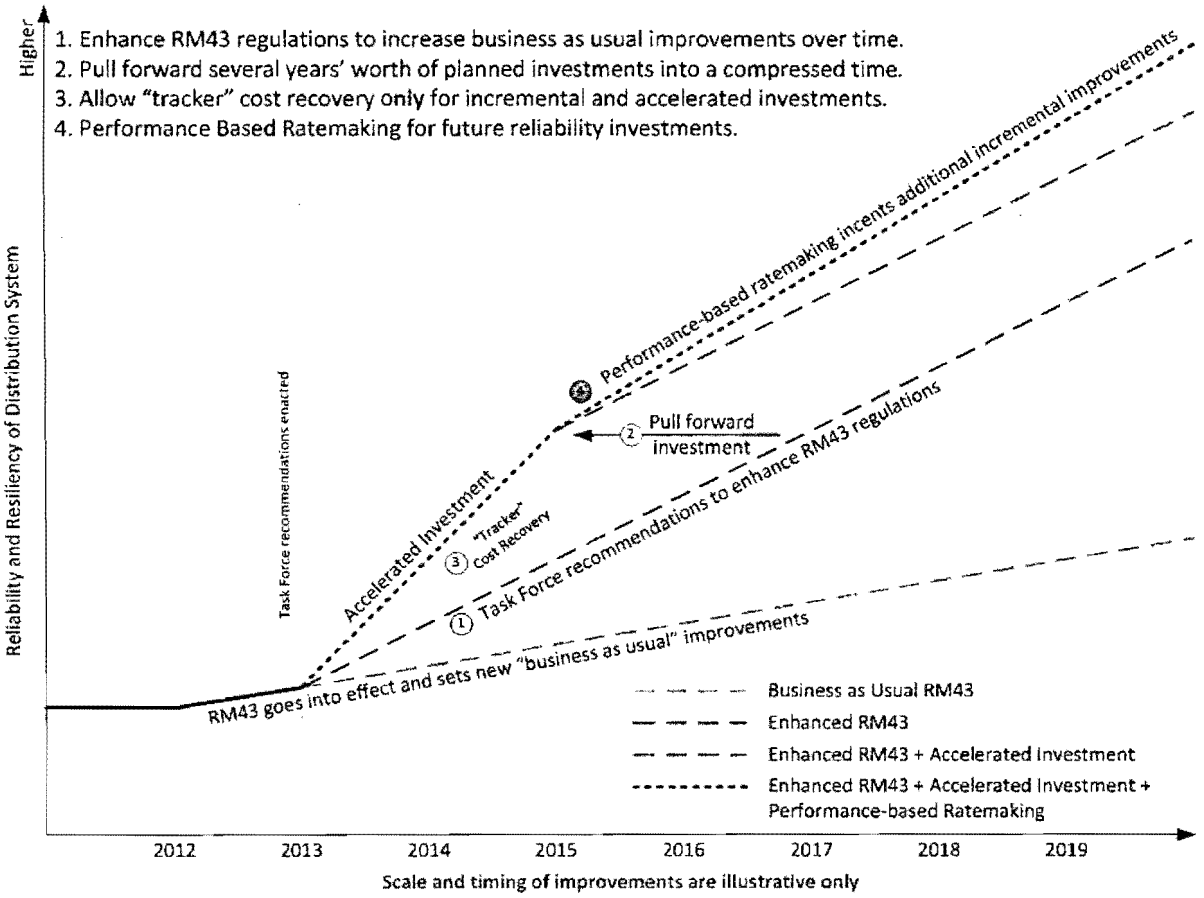
In the second recommendation, "Accelerate RM43's March Toward Reliability," the Task Force recommends accelerating several years' worth of business-as-usual investment to attain an increase in system resiliency into a compressed time frame such as the next 24 months, in order to jump start the pace of reliability improvements. Marylanders want and need reliable and resilient service now; by accelerating the investments needed to achieve these improvements, utilities can provide a tangible benefit for their investment. As illustrated by the chart below, the PSC can direct utilities to invest above and beyond their enhanced RM43 requirements in areas such as vegetation management and poor performing feeder remediation. For example, by condensing four years' worth of investment into a compressed time frame, Maryland ratepayers will likely see an increase in resiliency along formerly problematic lines in the next 24 months.

In the third recommendation, "Allow a Tracker Cost Recovery Mechanism for Accelerated and Incremental Investments," the Task Force recommends allowing utilities to recover costs through a tracker-like mechanism for the accelerated and incremental investment. Given that these investments would be above and beyond what is contemplated by the enhanced RM43 regulations, the Task Force believes that it would be appropriate to provide more contemporaneous cost recovery for these additional expenses. The tracker mechanism would not apply to the normal investment required to meet the enhanced RM43 regulations.

Finally, in the fourth recommendation, "Implement a Ratemaking Structure that Aligns Customer and Utility Incentives by Rewarding Reliability that Exceeds Established Reliability Metrics and Penalizes Failure to Reach Those Metrics," the Task Force encourages the PSC to implement a performance based ratemaking process for investor owned utilities, linking a utilities' progress or failure to meet certain reliability metrics with its authorized rate of return. The Task Force believes that such a structure would better align rewards with performance. By rewarding smart investment that drives incremental improvements to reliability and penalizing lagging performance, the PSC could incent investment choices that will help provide all Marylanders with a more reliable and resilient distribution grid.

The following chart is an illustrative example of reliability improvements that may be realized under a joint rollout of recommendations. Please note that the scale and timing of the improvements are not intended to be exact. The Task Force stresses the synergistic aspect of these recommendations and feels that the best way to improve resiliency in both the near term and long term is to enact all the findings in a cohesive and coordinated manner.

Figure 1 - Task Force Recommendation Implementation Strategy



Mission
History
Steering Committee
Advisory Council
Strategy and Approaches
Funders
Staff
Reid Detchon
Patrick Hughes
John Jimison
Sara Walker

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JOHN JIMISON

John W. Jimison is the Managing Director of the Energy Future Coalition. The Energy Future Coalition is a broad-based, non-partisan public policy initiative of the UN Foundation that brings diverse stakeholders together to bridge their differences and identify energy policy options that address the great challenges of oil dependence, global climate change, and the maintenance of strong and growing economies.

Prior to joining the Energy Future Coalition in 2011, Mr. Jimison served as Senior Counsel to the Energy and Commerce Committee of the U.S. House of Representatives, advising Chairman Henry Waxman and the committee's other members on a range of legislative issues in energy policy. His responsibilities included energy efficiency, regulatory matters, energy markets, and electric grid modernization. He was a principal House staff counsel on the energy-related provisions of the American Recovery and Revitalization Act of 2009, the energy efficiency and electric-grid provisions of the Energy Independence and Security Act of 2007, and numerous other House-passed energy-related bills, such as the Waxman-Markey American Clean Energy and Security Act, the Homestar Energy Retrofit Act, and the Rural Star Energy Loan Program Act.

Mr. Jimison practiced energy and regulatory law from 1987 through 2006 in Federal and state forums. He was recognized as a leading national advocate for clean, efficient distributed generation and CHP, and as an expert on natural gas and electric utility matters. He continues to serve in the pro-bono role of General Counsel to both the International Association for Energy Economics and the U.S. Association for Energy Economics. From 1982-1985, he was Principal Administrator at the International Energy Agency in Paris, France, responsible for electricity and natural gas policy and analysis, as well as country expert for Spain and Australia.

During the period from 1972 through 1981 he held several positions on Capitol Hill, including a previous period as Counsel to the Energy and Commerce Committee, service as Head of the Energy Section of the Congressional Research Service (Library of Congress), and as Professional Staff to the Senate Commerce Committee when it had jurisdiction over natural gas and electricity policy.

He is a graduate of the College of Wooster and Georgetown University Law Center, a member of the Washington, D.C., and Virginia Bars, a member of the Energy Bar Association, and a former Peace Corps volunteer in Somalia, East Africa. He was named a Senior Fellow of the USAEE, and has also been honored with national awards by the Alliance to Save Energy, the National Association of State Energy Officers, the International District Energy Association, and the Demand Response and Smart Grid Coordinating Council. He is married to Mitzi Sarantos Jimison and is the father of David, Peter, and Andrew Jimison.

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GALVIN ELECTRICITY INITIATIVE

Sponsored by The Galvin Project, Inc.

Perfecting Power for a Secure, Sustainable Energy Future

John Kelly

Executive Director
Galvin Electricity Initiative

As Executive Director of the Galvin Electricity Initiative, John Kelly is leading research into improved electricity governance models and the development of innovative Perfect Power prototypes. These prototypes are being designed to serve as a test bed where innovative technologies and polices can be refined.

Kelly has been a featured speaker on sustainable development, smart grids, utility restructuring, distributed energy technology, and energy markets. He is a founder of the National Energy Center for Sustainable Communities (www.necsc.us) and is also one of the founders and past treasurer of the Midwest Energy Efficiency Alliance (www.mwalliance.org). Kelly received a degree of Bachelor of Science in Energy Engineering from the University of Illinois, Chicago and a certificate in Environmental Engineering from the Illinois Institute of Technology.

IN THE NEWS...

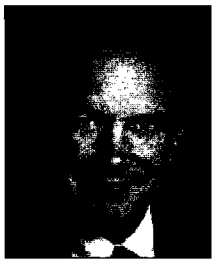
PPI is currently looking for participants to help develop Version 1 of the Perfect Power Seal of Approval

Kurt Yeager To Moderate "Big Data Management for Energy and Smart Grid" Event

Perfect Power Institute™ white paper featured in Smart Grid Today

Perfect Power Institute™ releases new white paper exploring the business case for grid modernization

more



KURT E. YEAGER

Kurt E. Yeager is currently the Vice Chairman of the Galvin Electricity Initiative, a non-profit focused on transforming the reliability and value of U.S. electricity service. Mr. Yeager initially served as the Executive Director of the Galvin Electricity Initiative since its inception in early 2005. This Initiative is focused on transforming the reliability, quality and value of electricity service through state-of-the art smart grid technology implementation, and transformation of the regulated utility business model. Mr. Yeager retired as President and CEO of the Electric Power Research Institute (EPRI) in September 2004. Mr. Yeager is a Fellow of the American Society of Mechanical Engineers and has served on several National Academy of Engineering Committees and the Energy Research Advisory Board to the Secretary of Energy. He is now also serving as a Convening Lead Author for the International Institute of Applied Systems Analysis (IIASA) "Global Energy Assessment" report to the United Nations and the World Bank. Mr. Yeager has authored over 200 technical papers and publications on energy and environmental topics. Most recently, he co-authored with Bob Galvin the 2008 McGraw-Hill published book entitled, "Perfect Power".

Recent Publications

- "In Search of Perfect Power", Kurt Yeager, Power Magazine (2009)
- "Perfect Power", Kurt Yeager and Robert Galvin, McGraw-Hill (2008)
- "Striving for Perfection", Kurt Yeager, IEEE Power & Energy Magazine (2008)
- "Bringing Digital Power to the Grid", Kurt Yeager, Engineering News Record (2008)
- "Perfect Power Prototypes & IIT", Kurt Yeager, Illinois Institute of Technology Insights: Highlights from 2007, Volume 2, The Alumni Edition (2007)
- "Electricity Enterprise: U.S., Prospects", Kurt Yeager, Encyclopedia of Engineering (2007)
- "Transforming the Electric Infrastructure", Kurt Yeager & Clark Gellings, Physics Today, American Institute of Physics (2004)