

# DECLARATION OF PERFECT POWER TRANSFORMATION

## *Explanation of Declaration Principles*

While the Declaration's first paragraph explains the *Declaration of Perfect Power Transformation's* purpose and origin, this document is designed to provide context that will help policy, regulatory and industry leaders, as well as the public, better understand and implement the principles espoused in the Declaration.

This Declaration resulted from the Galvin Electricity Initiative efforts over the past 6 years to engage customers, policymakers, providers, municipalities and other stakeholders in research and prototypes to design the electricity system of the future based on customer needs.<sup>1,2,3,4</sup> The Principles represent a re-electrification framework that encourages continuous improvement and investment by both customers and providers — investment paid for through savings (e.g., elimination of waste and energy conservation) and revenue from improved market pricing. These potential savings attract investment and innovation that will enable all customers to save and to profit. **These Principles establish the framework for governance that enables and encourages continuous innovation, investment and improvement.**

The Declaration is intended to invigorate, excite and energize, not to threaten. Just as the re-electrification benefits are boundless, the opportunities for customers, innovators and utilities are infinite as America's creativity and ingenuity are unleashed, as was the case when our nation was first electrified more than a century ago. The terms and concepts in the Declaration are necessarily simple so as to encapsulate both the key overarching concepts and be understandable to the layperson.

Accordingly, the term "customers" means all electricity purchasers, whether they are residential ratepayers, large industrials, mid-sized commercial user or small apartment dwellers. This usage is generally focused on a conventional consumer/purchaser meaning; however, where appropriate, the term can be extended to include any person or entity generating, storing and/or using (or avoiding the use of) energy. Similarly, the Declaration uses the term "innovator" to mean anyone who brings new, creative, transformative change to the electric power industry. Such innovators can be a single person working in their proverbial garage, a multi-national corporation pursuing an entrepreneurial approach, a utility transforming its relationship with its customers or a regulator who is breaking down barriers to change. A transformative change can be either a new business model that will gradually yield change or

<sup>1</sup> Galvin, Robert, and Yeager, Kurt. *Perfect Power—How the Microgrid Revolution Will Unleash Cleaner, Greener, and More Abundant Energy*. (2009, McGraw-Hill).

<sup>2</sup> Galvin Electricity Initiative. (2010, December 8). Bob Galvin's Recipe for Transforming the Electricity Sector. Retrieved from [http://www.galvinpower.org/sites/default/files/Bob\\_Galvins\\_Recipe\\_For\\_Electricity\\_Transformation.pdf](http://www.galvinpower.org/sites/default/files/Bob_Galvins_Recipe_For_Electricity_Transformation.pdf)

<sup>3</sup> Galvin Electricity Initiative. (2010, July 15). Illinois Electricity System: Guiding Principles and Policy Framework. Retrieved from <http://www.galvinpower.org/sites/default/files/Illinois%20Electricity%20System%20Guiding%20Principles%20and%20Policy%20Framework.pdf>

<sup>4</sup> Perfect Power Institute. Potential Benefits and Costs Associated with Grid Modernization: A Preliminary Assessment. (Pending publication in February 2012 on [www.perfectpowerinstitute.org](http://www.perfectpowerinstitute.org))

# DECLARATION OF PERFECT POWER TRANSFORMATION

a revolutionary disruptive technology. The key is the direction — innovations that transform today's legacy systems into tomorrow's Perfect Power electricity system.

The Declaration uses the term “utilities” to mean both rate-regulated, monopoly public utilities in non-restructured jurisdictions, as well as all electricity providers and load-serving entities in restructured settings. This is an important point of the Declaration. While its call for transformative action is revolutionary in vision, it is understood that the complexities in the country's current electricity landscape prevent a one-size-fits-all approach and evolutionary steps may be necessary.

Finally, given the differences across the country, a one-size-fits-all transformation of the electricity systems may not be immediately possible. Accordingly, the Declaration encourages small, localized actions that clearly demonstrate the transformative benefits. However, ultimately, consistency will be needed to achieve both scale and scope.

The Declaration is divided into two parts: customers and innovators in one part, utilities and generators in the other. This partition is purposeful. To achieve the desired Perfect Power Transformation, there must be transformation on both the consumption side as well as the generation and delivery side. Thus, the Declaration offers guiding transformative principles for both.

## Declaration Principles Explained

- **Empower customers and enable innovators by:**
  - ***Providing all customers secure access to their timely usage data and comprehensive dynamic pricing options.*** It's rare that a customer purchases a product without knowing the amount and price is not known. Yet that is exactly the scenario in most current electricity systems. Without real-time usage and pricing information, the customer is blind and dumb, and innovators cannot leverage real-time usage and price data to provide new value (e.g., virtual energy audits, price arbitrage, security, appliance diagnostics, etc.). Thus, the first and most important step in customer empowerment is providing customers with access to their electricity purchasing information in a dynamic, real-time and user-friendly format. It is also important that the information be comprehensive, including all pricing components. This promotes transparency and can be achieved by providing intelligent meters that are capable of streaming direct usage data to customers. The Declaration also calls for providing customers with a wide array of dynamic pricing signals (real-time, time-of-use, flat rates based on actual load profile) that reflect how prices vary throughout the day.<sup>4</sup> The Independent System Operators have created and will continue to create new market-pricing signals that value customer participation and treat any stakeholder as suppliers. This includes demand response and day-ahead pricing signals, as well as payments for ancillary services (e.g., capacity, voltage support, spinning

<sup>4</sup> Galvin Electricity Initiative. (2011, January) Maximizing Consumer Value through Dynamic Pricing. Retrieved from [http://www.galvinpower.org/sites/default/files/DynamicPricing\\_0110.pdf](http://www.galvinpower.org/sites/default/files/DynamicPricing_0110.pdf)

## DECLARATION OF

# PERFECT POWER TRANSFORMATION

reserves). Ensuring that all customers have access to these market pricing signals will encourage investment and innovation by providing a financial incentive to customers.

- ***Allowing customers, businesses and communities choice in purchasing electricity services.*** This principle — consistent with the Declaration’s vision — could be interpreted as a call for retail choice, and there are certainly some transformative benefits to that. But, given the diversity of regulatory regimes governing utilities across the country, the Declaration is calling for choices of electricity services, not necessarily just between providers of those services. The term “electricity services” is purposely vague to allow for an expansive interpretation. The key sentiment of this Principle is to allow each customer to decide what they want from their electricity provider, be it choice of different pricing offerings, supply content or technologies that help them better manage their usage (e.g., access to smart applications from any source).
- ***Removing barriers that prevent innovators from providing services directly to customers.*** Consider that innovators like Motorola could not have introduced the mobile phone to customers without policy reforms that provided access to the wireless spectrum. The electricity sector could accelerate innovation by providing innovators open access to electricity management and customer service markets. When done appropriately and respecting legitimate provider and privacy concerns, this can promote new thinking, new development and new technology.
- ***Providing simple, quick, low-cost interconnection and full value for customer-side distributed generation and storage.*** Interconnection standards are the technical requirements and legal procedures that would allow a utility customer to make two-way connections — a prerequisite for net metering. Regulations and procedures must be reformed to allow states to adopt a consistent, transparent set of provisions that facilitates these connections in the most customer-friendly ways.
- ***Permitting aggregation of electricity sources and loads with creative metering.*** As any shopper at Costco or Sam’s Club can attest, buying in bulk generally saves money. Yet, there are barriers preventing small electricity customers from joining together with other small customers to combine or aggregate their electricity purchases to buy in bulk. The Declaration seeks to reduce these barriers by calling for the establishment of rules that allow customers, communities, campuses, multi-tenant buildings and facility owners to efficiently combine or aggregate meter loads. Such physical and virtual aggregation, when combined with creative metering arrangements, can streamline billing and can enable the purchase of electricity that costs less, is more environmentally friendly or both. Aggregation can lead to increased investment in clean distributed generation and access to new and innovative pricing structures and ancillary services. The term “creative metering” in this context means virtual, net or other metering arrangement that gives aggregated (or individual) customers control of their electricity usage and cost information. This could include offering dynamic pricing to power “sold” as metering arrangements due to power consumed, as well as promotion of on-site generation.

## DECLARATION OF

# PERFECT POWER TRANSFORMATION

- ***Encouraging and enabling microgrid development to optimize electricity delivery and use.*** Microgrids are a new way of thinking about how we design and operate the electricity distribution grid to enable the real-time exchange of information and energy. They can integrate seamlessly with and respond to bulk power demand response and price signals, flattening out bulk power demand, lowering cost and improving bulk power grid asset utilization. Both utilities and private entities can own and operate microgrids. Yet, often there are restrictions in the current electricity system policies that discourage and, in some cases, prohibit utility or third-party investment in and development of microgrids. Breaking down these barriers and enabling microgrids will pave the way for innovation and private investment into local sustainable smart microgrids that support the bulk power system and distribution companies. This includes the integration of distributed generation, district energy, storage, local renewables, underground distribution and demand response.
  
- **Reshape the regulatory compact so utilities and suppliers are:**
  - ***Encouraged to engage innovators and local governments to empower customers.*** In the 20th century, the dominant relationship was between utilities and their ratepayers. That worked well and became the greatest engineering achievement of the century. But, as the country moves deeper into the 21st century, the “electricity ecosystem” must expand beyond just the utility and ratepayer. To do that, utilities need to engage those who have new and innovative technologies and ideas so that the customer is both empowered and better served. The results will also significantly increase utility shareholder value. Expanding the ecosystem takes effort and needs to be encouraged. That is what the Declaration espouses.
  
  - ***Provided with improved customer-driven performance metrics that encourage higher levels of reliability, customer service, environmental stewardship and energy efficiency.*** There must be incentives that motivate utilities and generators to provide electricity quality that meets the needs of 21st century customers. As stated by quality management leader Joseph M. Juran, “Without a standard there is no logical basis for making a decision or taking action.” Bob Galvin asserted that the path to customer value is based on defining the customer needs and a set of performance metrics that provide evidence that these needs are being achieved. Customer needs apply to the current and future expectations of the customer and society as a whole. Customers, municipalities and businesses have clearly indicated their desire for competitive electricity that is safe, reliable, efficient and clean. As the former Nevada governor John E. Jones once said, “What gets measured gets done, what gets measured and fed back gets done well, what gets rewarded gets repeated.” Today, outages of less than 300 seconds are not even recorded. But, in a digital world we need an uninterruptible power supply — an outage of even a second can be very costly.
  
  - ***Compensated based on performance, not simply the amount of electricity sold.*** The regulatory structure should link customer value to utility earnings. This includes compensating utilities based on their overall performance, taking into account reliability, power quality, efficiency of operation, innovations and customer service, instead of simply the amount of electricity they

## DECLARATION OF

# PERFECT POWER TRANSFORMATION

sell. The Declaration envisions electricity systems unburdened from constraining restrictions that inhibit both innovation and profitability. Accordingly, the Declaration emphasizes that increasing customer value should also yield increased utility revenues and profits. To achieve this conversion, this principle urges that the method for compensating the utilities be based on their increased electricity service value instead of the legacy “electron as a commodity” throughput approach. We understand that this transformation may affect others, like the local government who relies on revenues based on the utility’s throughput and urges that corresponding transformative changes be made in those settings so that they do not inhibit or undermine the desired transformation in the electricity system.

- **Encouraged to maximize environmental performance and drive out waste.** We must build mechanisms into the transformed regulatory compact that incentivize utilities to continually improve their environmental performance and achieve greater economic efficiencies that will drive out waste, just as there is in other market-driven and customer-oriented industries.
- **Incentivized to maximize the performance quality and use of existing utility, generator and customer-controlled infrastructures to achieve the desired transformation.** While the Declaration envisions significant transformation and new infrastructure investment, it also recognizes the value of the current infrastructure. That infrastructure served us well and its performance should be maximized whenever possible to save costs.

### About the Galvin Electricity Initiative

Robert W. Galvin founded the Galvin Electricity Initiative to transform our electric power system into one that is reliable, efficient, secure and clean, and meets the needs of 21st century customers. The Initiative continues to spark a migration toward a customer-driven electric power system that is based on quality leadership. The goal is to promote grid modernization through policy reform and the development of Perfect Power smart microgrids that place top priority on serving customers and businesses with extremely reliable, high-quality, clean power. For more information, visit [www.galvinpower.org](http://www.galvinpower.org), “like” [Facebook.com/galvinpower](https://www.facebook.com/galvinpower) and “follow” [Twitter.com/perfectpower](https://twitter.com/perfectpower).

### About the Perfect Power Institute

The Galvin Electricity Initiative has founded the non-profit Perfect Power Institute (PPI), led by John Kelly, to ensure a sustainable future for the Initiative’s power system transformation stimulus. The PPI mission is to fundamentally improve the competitiveness of our nation’s cities and businesses by helping electricity leaders and stakeholders to dramatically improve power system performance – improvements paid for by eliminating waste and engaging customers. The PPI has three key strategies to stimulate investment and innovation: (1) develop a **design and performance assessment system** that provides a confident roadmap for improvement emphasizing Perfect Power microgrids; (2) **assist early adopters** to achieve and document success, and build wider support; and (3) **develop a training and learning system** to inspire and educate professionals and leaders. These strategies and their results will demonstrate and reinforce the “Declaration of Perfect Power Transformation’s” essential importance to our nation. For more information, visit [www.perfectpowerinstitute.org](http://www.perfectpowerinstitute.org).