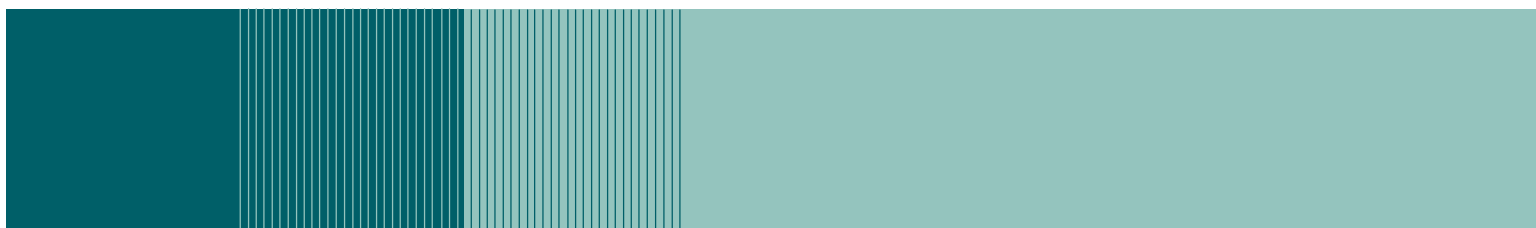


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Innovation in Retail Electricity Markets: The Overlooked Benefit



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I. INTRODUCTION

The United States retail electric market is at a critical stage in its evolution. Retail markets are providing benefits to consumers in the form of new products and services and innovative methods of providing service. Despite this evidence some analysts and regulators have expressed a desire to return to a more regulated, less open market place in which government bodies dictate investment decisions and customers are not provided the opportunity to take control of their own consumption decisions.¹ Much of the concern with retail electric markets apparently stems from naïve comparisons of price without any real attempt to understand and evaluate other factors influencing customers' demand for and choices of services. Few consumers make consumption decisions based solely on price without taking into account quality, convenience, or novelty. Yet much of the debate over electricity restructuring *assumes* customers care nothing about the characteristics of the products and services they buy or the characteristics of the providers of these services.² Without evaluating these other aspects of the marketplace, we are left with an incomplete and distorted picture of the true nature of restructured markets. Customer choice is more than just price, it is just as important for customers that products provide convenience, quality, environmental attributes and control over their usage. To ignore this and turn away from customer choice would reduce the incentive for suppliers to provide innovative services leaving customers with fewer choices and, in turn, lowering overall customer benefits.

This paper presents empirical and conceptual evidence to show that movement away from free markets would be harmful to consumers. This is based on the analysis of the types of products and services that are available to consumers in open market places and the innovation that has occurred in these markets. Consumers in open market places benefit from the competition among suppliers to provide more and better products and services. This is certainly true in markets for large use customers. However, there is a compelling case that smaller customers, including residential, can, and are, benefiting from the same competition that has brought innovation to larger customer markets.

We begin the analysis by looking at the actual results of competitive retail electric markets in Section II. Section III then describes the reasons why we should expect open markets to provide these benefits and Section IV is reserved for a brief conclusion of our findings.

¹ This white paper was prepared primarily by Dr. Karl A. McDermott, a Vice President at NERA and Dr. Carl R. Peterson, a Senior Consultant at NERA. We thank those that commissioned this paper for providing data to support this work. We also thank the many reviewers that provided comments on the initial draft of this paper. However, the opinions expressed herein are solely attributable to the authors as are any errors or oversights.

² In this report we will use the terms *restructured* or *restructuring* to refer to wholesale and retail electric markets where government-imposed entry restrictions have been removed or lessened. This may also allow for customers to obtain non-discriminatory access to different suppliers of electricity and energy-related products and services. Where we discuss *perfectly competitive* markets we are referring to a specific economic theory. Perfectly competitive markets are characterized by free entry, constant technology across firms, a homogenous product, price taking behavior on the part of firms and prices set at marginal cost in the long-run.

II. RETAIL ELECTRIC MARKETS ARE DELIVERING ON THE PROMISE EVEN AS MARKETS CONTINUE TO EVOLVE

That retail electric competition is about more than price competition should not be in serious debate. Indeed it is one of the fundamental promises of electric market reform that competitive markets will provide consumers with innovative products and services. Regulatory bodies have recognized this concept.³ For example, in a report to the Texas Legislature by the Staff of the Texas Public Utility Commission, the Staff states: “[T]here are benefits of competition beyond lower prices for electricity, such as a variety of services and pricing options and efficient mechanisms for promoting renewable energy and energy efficiency.”⁴ Competition in electric markets provides incentives for firms to be creative and provide new products and services.⁵

In analyzing the restructuring of electric markets to explore how, and if, competition is providing these benefits we first develop an economic construct or model with which we can verify that retail electric markets are providing these benefits. We then review the evidence to date on the experience of retail electric markets and place those results in the context of the economic model Section II ends with a discussion of the continued evolution of retail markets using evidence from non-US markets and a discussion of the implications for the continued evolution of restructured markets using modernized distribution grid technology.

A. Conceptualizing the Benefits of Restructured Retail Electric Markets

Retail electric markets present some of the same challenges that all retailers face and potentially more challenges. A significant business challenge is managing the political and regulatory uncertainty surrounding retail electric markets. These challenges range from differing rules, regulation and market design between jurisdictions to the complete scrapping of retail market design. In addition, retailing margins can vary from industry to industry and from country to country based on consumer preferences and other factors such as the mix of products that retailers sell.⁶ In the electric industry retailing margins may be extremely thin due mainly to the

³ The objectives of retail electric market restructuring often included the idea that competitive markets would provide new and better service options and create incentives for innovation. *See* discussion of the objectives for state retail electric market restructuring in “Report to Congress on Competition in Wholesale and Retail Markets for Electric Energy,” The Electric Energy Market Competition Task Force, Pursuant to Section 1815 of the Energy Policy Act of 2005, Final Report, April 2007.

⁴ “Electricity Pricing in Competitive Retail Markets in Texas” Staff Report presented to the Texas Legislature February 3, 2006, Project No. 32198.

⁵ This concept that firms must innovate to survive is a theme running through the economic literature on innovation. *See e.g.*, J. Sundbo, *The Theory of Innovation: Entrepreneurs, Technology and Strategy*, Edward Elgar Publishing, 1999.

⁶ *See e.g.*, D.S. Hosken, R.S. McMillan and C.T. Taylor, “Retail Gasoline Pricing: What Do We Know?” Bureau of Economics, Federal Trade Commission, Working Paper No. 290, Federal Trade Commission, May 2007; K.L. Ailawadi and B. Harlam, “An Empirical Analysis of the Determinants of Retail Margins: The Role of Store-Brand Share,” *Journal of Marketing*, 68(1), pp.147-165, 2004; R.G.J den Hertog, J.C.A. Potjes and A. R. Thurik, “Retail Profit Margins in Japan and Germany,” *Review of World Economics*, 130(2), pp. 375-390, 1994.

to the existing retailing cost structure. Further, customer acquisition costs can be significant, at least for mass market customers.

In a 2000 paper on retail electric competition MIT economist Paul Joskow explored the ways in which retailers typically add value.⁷ Professor Joskow listed six typical ways in which retailers add value. These include providing convenient buying locations, selling a wide range of products, providing information at point of sale, providing return services and other post sale services, passing on the benefits of large scale wholesale buying, deploying innovative retailing technologies as well as creating reputation among buyers for quality of service. Joskow also identifies certain constraints in the electric market that may hinder retailers' abilities to provide these value added services.⁸ For example, delivery of retail electric supply is generally accomplished through a public network (i.e., the transmission and distribution networks) and consumers can consume the product or service at their convenience. Furthermore, post sales services, such as return services, may be less important in the retail electric business. Some of the retailing benefits that Joskow mentions are likely candidates for the retail electric market, such as better wholesale purchasing, developing innovative retailing technologies, and creating reputations for providing good service, especially providing useful and accurate information concerning customer choices.⁹ Indeed even the distribution network may change to the extent that price signals from competitive wholesale markets incent the development of localized distributed generation. In this case, some consumers may begin to utilize private networks to deliver power and energy. However, Joskow opines that electric retailing may potentially increase, in aggregate, certain costs such as advertising, promotions, billing settlements and other transactions costs associated with retailing.¹⁰ Therefore, due to the potential for increasing costs, retailing must provide other benefits that offset these costs.¹¹

Joskow cites the following as potential benefits from retail electric competition:¹²

§ **Reducing the Cost of Retailing Electricity:** Retailing costs may include marketing, billing that could be reduced through the innovative use of existing technologies (e.g., internet) or creation of new technologies.

⁷ P.L. Joskow, "Why Do We Need Electricity Retailers? Or Can You Get It Cheaper Wholesale?" MIT, Department of Economics, Discussion Paper, February 13, 2000. Professor Joskow's paper is skeptical of the benefits from retail competition. However, it provides a useful model within which to conceptualize the possible benefits from retail competition and evaluate the market results to date.

⁸ Id. pp. 14-16.

⁹ This has long been a complaint, justly or unjustly, by electric utility customers.

¹⁰ Whether these costs will increase depends on the avoiding of retailing costs by incumbents and the effectiveness of deploying cost reducing retailing practices by entrants.

¹¹ Although Joskow does note that, at least for the incumbent electric utilities, the retailing costs are a rather small part of the overall cost structure, suggesting that retail margins are likely to be rather small. (Id. at 30-31) This might suggest that retailing cost increases from retail competition would be a rather small fraction of total costs as well. Therefore, if retailers can add value from other sources, the rather small increase in retailing costs would be more than offset by other benefits.

¹² Id. pp. 18-24

- § **Superior Wholesale Procurement:** Retailers may be able to more effectively procure power in the wholesale market either through a better optimization of procurement or more effective contracting practices.
- § **Installation of Metering Equipment:** Many customers do not have the metering equipment to integrate wholesale market pricing directly into retail market prices. Investments in more sophisticated metering systems may provide efficiency benefits.¹³
- § **Price Hedging for Customers:** Retailers may be able to more effectively provide the “right” type of hedging services for customers. Customers can be risk averse which creates a demand for insurance services as we noted above. The quantity demanded of insurance, however, may differ among customers. Retailers may be more effective at both determining which customers want what level of insurance and minimizing the cost of providing that insurance.
- § **Other Hedging Services:** Since electricity usage varies according to weather patterns, retailers may be able to provide weather-related insurance vehicles. Although Joskow did not mention this aspect, climate change products may also fall into this category.
- § **Behind the Meter Applications:** Complementary services such as engineering, operations, and energy management services that better match customer’s diverse preferences may also be an area where retailers can add value over and above the simple procurement of energy.
- § **Sustainable Energy:** Environmentally benign sources of power have become, for many different reasons, a growth market. Many states now require a certain level of green or renewable resources in generation portfolios, retailers may be able to add value by selling products that have different environmental characteristics for those customers that demand such products. Green Power, however, is probably an outdated term, as today’s market for clean energy products includes not only renewable (or green) energy, but demand response, energy efficiency and carbon footprint products.
- § **Total Energy Management Services:** Many customers, especially those large customers with production and other energy-using facilities, may look to retailers to provide a “one-stop” shopping venue.
- § **Promote More Efficient Wholesale Markets:** What may, in the end, be the most important value that retail competition can provide is the promotion of a more efficient wholesale market. It is now widely accepted that demand response is critical to a well functioning wholesale electricity market. By aligning retail pricing

¹³ Joskow wrote this paper in 2000 when many of the now current Advanced Metering Infrastructure technologies were not widely available. We will discuss this aspect of the retail market later in the paper.

approaches with wholesale markets, retailers can provide significant social benefits from the more efficient operation of wholesale markets.

It is important to note that only two of these nine categories are directly related to lowering prices for consumers.¹⁴ Most of these benefits occur as a result of retailers segmenting customer demand and providing services that are more closely tied to the needs and desires of customers. (We discuss the economics of market segmentation in Section III.) These services will, by definition, be innovative and new, otherwise the services would have been previously provided. We must now gather evidence from actual market operations to determine if retail competition is indeed delivering on its promise of promoting innovation in retail electric markets.

B. Retail Electric Markets are Creating Value for Consumers through Innovation and Attention to Customer Demand

Innovation in retail electric markets can take many forms from pricing innovations to technological solutions. In this section we review the evidence from retail electric markets to explore the benefits of retail competition discussed above. This section will present a cross section of information on retail markets and the products and services provided. We map these services to the customer characteristics discussed earlier to explore the whether retail markets are responding to customers' demands.

To put this analysis in context it is important to understand that retail markets are still in their infancy in many jurisdictions in the United States. The first states to restructure retail markets did so just over a decade ago. However, the implementation of retail access is actually much younger as regulators were required to implement the "rules of road." Unbundling, corporate restructuring, affiliate rules and regulations among other policies and procedures were required. Perhaps the most important regulatory policy affecting the evolution of retail markets is the oft-referenced transition periods. This is the period after retail access was legally introduced, but before rates for generation-related services are allowed to reflect market conditions. While a number of jurisdictions have recently exited this transition period, many areas are still under transition era regulation or have opted for extending the transition periods.¹⁵ This has provided even less time for retail markets to evolve.¹⁶ In analyzing the electric retail market, one must also be careful to distinguish between concerns over the cost pressures of the industry as a whole and

¹⁴ These categories potentially include lowering the cost of retailing and better wholesale procurement. It is conceivable that promoting more efficient wholesale markets may present customers with lower prices *than otherwise would be the case*. However, more efficient prices do not necessarily imply lower prices. For example, during the 1970s the US government set maximum prices for gasoline which, in general, turned out to be lower than the market price. The policy created economic shortages as gasoline was rationed on "first-come-first-served" basis. While the cash price of gasoline was indeed lower than the efficient price (i.e., the market price), the total price (the cash price plus the hassle and other indirect costs) would certainly be no less than the market price.

¹⁵ For the status of electricity restructuring by state *see* http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html

¹⁶ Other restructured markets have had similar evolutionary periods. For example, AT&T still commanded the largest share of the long-distance telephone market many years after it was divested.

the actual operation of the retail and wholesale market. Many consumers and regulators are concerned, understandably so, with the general increase in prices experienced by most electric customers.¹⁷ However, the purpose of this paper is not to directly compare prices, but rather to determine if retail markets are presenting customers with new and innovative services.¹⁸

1. The Number and Types of Products and Services Provided in Retail Electric Markets Provides Evidence of Innovation and Consumer Benefits

Even with the hurdles that have faced the development of retail competition, customers have benefited from retail market restructuring. For example, Wal-Mart, a major electricity consumer in many jurisdictions in the United States, summed up its experience with retail competition:

Competitive choice providers offer many new types of products and services which meet the varied needs of Wal-Mart's facilities. For example, the Wal-Mart Supercenters require lighting, refrigeration and HVAC 24 hours a day. These facilities have different load profiles and needs than some of the other Wal-Mart facility prototypes. We have found that competitive suppliers will structure various rates, such as Time-of-Use, Energy plus losses, block structure, pricing based on a particular natural gas index, as well as a fixed-priced rates, to meet the needs of our individual stores and help us better manage our load in a cost-efficient manner.¹⁹

Wal-Mart is describing a set of product offerings that are customized for its facilities. Wal-Mart contrasts these competitive product offerings with its experience in markets that are not open to retail competition:

...it has been Wal-Mart's experience in states with no realistic competitive choice that the monopolistic supplier maintains its traditional "one-size-fits-all" service with very limited options that are designed to benefit the utility and not the customer. Such a structure is contrary to the manner in which Wal-Mart and many others that strive everyday to provide customers products that customers want, do business.²⁰

Despite the uneven evolution of retail electric markets for all consumers in the United States and the concerns expressed over price increases, there have been clear success stories in

¹⁷ The Energy Information Administration (EIA) reports that overall electric prices (i.e., for all electricity suppliers) in the US have increased for all major groups of customers between 1995 and 2006, with most of the increases occurring after 2000. *Electric Power Annual 2006*, Table 7.4, EIA, Washington DC, November 2007.

¹⁸ See e.g., J.P. Pfeifenberger, G.N. Basheda and A.C. Schumacher, "'Restructuring Revisited,'" *Public Utilities Fortnightly*, June 2007, pp. 64-69. The conclusion reached in this paper is that price increases are systemic and similar across restructured states and those that have not restructured.

¹⁹ Comments of Wal-Mart Stores Inc., *Notice Requesting Comments on Wholesale and Retail Competition*, FERC Docket AD05-17-000, November 2005 at 10.

²⁰ Id. at 10-11.

markets for smaller use customers that have been documented by regulators.²¹ In two jurisdictions these benefits for residential customers have been recently documented:

§ **Texas:** Retail competition has provided an “abundance of service offerings from which customers may choose.” Seventeen retail providers were offering between thirty-five and forty-one different products (including the standard offer) for residential customers. Four of these providers were offering five different renewable options.²²

§ **New York:** Retail suppliers “are providing value-added services such as fixed commodity prices, capped and indexed commodity prices, bundled telephone service, “green” power generated from renewable resources, or consulting services. Value-added services for large commercial and industrial customers include sophisticated hedging and price-certainty arrangements, energy efficiency and energy management services, and demand response assistance and support.”²³

- Four of six service territories fixed price contracts offered residential customers as many as three different products in one service territory.
- Load control, energy efficiency and telephone service bundled with energy.
- Green products are also provided. 162,000 MWhs purchased voluntary in 2004
- Customers are satisfied with retail suppliers as indicated by high retention rates and customer satisfaction surveys.

These observations by the regulators in these two states provide evidence for the benefits of retail competition discussed by Professor Joskow.²⁴ Indeed these markets are beginning to evolve quickly. In the last year since the Texas Commission’s report was issued, the number of providers and types of services offered to residential customers in the Texas market has increased significantly. There are now reported to be twenty-seven suppliers or roughly sixty percent more than the prior year. These suppliers are now providing upwards of one hundred different products in the state or more than double the number of products and services the Texas PUC reported merely twelve months prior. These products range from different versions of green products (e.g., pollution-free products, double REC products) to various levels of price certainty

²¹ The general frustration over the slow evolution of retail markets is well documented as are several of the barriers to retail market evolution. See e.g., Electric Energy Market Competition Task Force Final Report *note 3*.

²² *Scope of Competition in Electric Markets in Texas*, Report to the 80th Texas Legislature, Public Utility Commission of Texas, January 2007. As of January 2008 these numbers have change significantly. See discussion below.

²³ *Staff Report on the State of Competitive Energy Markets: Progress to Date and Future Opportunities*, New York Public Service Commission, March 2, 2006, pp. 40 and 43.

²⁴ It is important to note that in 2006 Joskow signed an open letter to policymakers in which policymakers were urged to continue to support restructuring and the continued evolution of competitive retail and wholesale electric markets. See Open Letter to Policymakers, June 26, 2006.

from month-to-month to three year contracts.²⁵ In addition, retailers are providing a full portfolio of payment options including credit card and bank drafts as well as the traditional methods of walk-in or US payments. While offering varied payment options may seem trivial to some, this is the type of convenience service that retailers provide. In New York, there is a similar evolution of the mass market. By January 2008 there were at least twenty-six suppliers providing over fifty different products. Again, these products range from various levels of price certainty (e.g., month-to-month up to five year contracts) to different environmental attributes (e.g., 50, 100 percent clean energy and wind-based rates).²⁶

It is also useful to explore the specific innovative products and services that are currently being offered by retail suppliers. Table 1 provides a general mapping of the types of value-added services that retailers were expected to provide and the services that are currently provided in retail electric markets based on the research completed for this paper.²⁷ The innovative nature of these services can be grouped in four general categories.

- § **New Pricing Options:** Many of the innovative financial arrangements are based on the diffusion of innovations from wholesale electric markets and other financial markets. Providing customers access to forward markets, spot markets and other financial arrangements represents an innovation in retailing that was brought about because of the restructuring of markets.²⁸
- § **Clean Energy Products:** It is apparent from our research that one of the key aspects of innovation in the retail market is related to clean energy products that go beyond the simple selling of electricity produced by environmentally benign sources. Retailers are providing customers with services that allow them to brand their own products, integrate a new ethic into production processes, and take advantage of environmentally beneficial cost saving opportunities such as demand response and energy efficiency options.
- § **Innovative Technological Solutions:** These solutions include the use of internet/software solutions for energy management as well as more traditional technology solutions such as HVAC and local control technologies.
- § **Customization:** These products and services are those that resemble traditional services, but are provided in new ways. This may include re-bundling, partial bundling or variations of energy-only products.

²⁵ All data for these conclusions were obtained from the Texas PUC Electric Choice web site: www.powertochoose.org (accessed January 17, 2008)

²⁶ All data for these conclusions were obtained from the New York PSC Electric Choice web site: www.energyguide.com (accessed January 17, 2008).

²⁷ Most of the products and services we reviewed for this paper are provided to non-residential markets. Although as documented above some residential markets are providing a set of robust product and service innovation. Later in the paper we review selected results from outside the US that suggest residential markets have the potential to develop more innovative products and services

²⁸ In some ways these product innovations are possible due to previous restructuring policies in securities, banking and other financial markets. This is an example of restructuring policies in one market having spillover benefits in other markets.

Table 1 categorizes a set of generic product types that are to be found in retail markets. We next look to specific products that have innovative or unique features.²⁹

²⁹ In the rest of this section we discuss actual retail electric market products and services. A recitation of the specifics of all of these products and services would require significantly more space. However, the descriptions of these products and services were obtained through non-confidential sources such as company web sites. We have not attempted to solicit confidential customer data or retailer business plans that may identify new products and services that will be marketed in the future.

Table 1: Retail Product Offerings

| Value Category | Customer Type⁽¹⁾ | Products Currently Offered by Retail Electric Suppliers⁽²⁾ |
|--|-------------------------------------|--|
| Reducing the Cost of Retailing Electricity | Price/Value/Bottom Line | Internet gateways/software enabling use of retail products |
| Superior Wholesale Procurement | Price/Value/Bottom Line | Discounted to price to beat/standard offer |
| Installation of Metering Equipment | Value/Bottom-Line/Price/Convenience | Smart grid technology use |
| Price Hedging for Customers | Value/Bottom-Line/Price/Convenience | Fixed Price Partial fixed/bandwidths Day Ahead |
| Other Hedging Services | Value/Principled/Security | Budget Control Products Power Portfolio Planning |
| Behind the Meter Applications | Security/Value/Bottom Line | Facilities control/demand control Distributed generation |
| Green Power | Principled/Value/Security | Renewable energy <ul style="list-style-type: none"> - Commodity - RECs/Green Tags⁽³⁾ - Green Brand Demand response <ul style="list-style-type: none"> - Control technologies - Software - Services Energy Efficiency <ul style="list-style-type: none"> - Performance Contracting - HVAC (all sectors) - Green buildings - Facilities management - Home Automation Carbon Footprint <ul style="list-style-type: none"> - Audits and Analysis - Carbon Calculators - Offsets |
| Total Energy Management Services | Principled/Value/Security Buyers | Portfolio services |
| Promote More Efficient Wholesale Markets | Value/Principled | Real Time/Indexing/Demand Response ⁽⁴⁾ |

(1) Institutional buyers may fall in any category. See discussion of customer segmentation in Section III.C

(2) Data collected by authors' for this report. Data is publically available on retail suppliers' web sites and promotional brochures.

(3) REC = Renewable Energy Credits

(4) Many of the other products will also promote wholesale market efficiency.

2. Clean Energy and Demand Response Products

Clean energy (CE) products are coming into focus for several reasons. First, regulators and policymakers are turning to such products as a means to hedge against future costs of emissions. Second, non-fossil fuel or renewable energy sources may also provide a hedge against future fossil fuel price increases. Third, clean energy products may also avoid the consumption of electricity thereby providing benefits. Many jurisdictions have adopted renewable portfolio standards or have otherwise promoted or subsidized renewable energy. However, it is worth noting that one of the benefits of restructuring is the shifting of risk of generation investment from customers to investors. Similarly renewable and other clean energy investments in competitive markets do not add risk of increasing prices of all customers, despite the fact that all customers benefit from these investments.

Retailers appear to have recognized that clean energy products provide significant benefits to consumers when provided in customized ways. One report indicates that of the top twenty-five non-residential retailers all but one sell renewable products and about half sell energy-efficiency or demand response products.³⁰ Table 2 summarizes the types of clean energy products provided by these retailers. Popular offerings include CO₂ offsets which may be bundled with products that include technological solutions such as total energy management software as well demand response and energy efficiency services and products. For example, Green Mountain Energy markets environmental products through its eMission Solutions division (www.emissionsolutions.biz). This company provides enterprise level environmental solutions to national corporations as a method of eco-banding forward-thinking organizations. For example, one product provided is a sequestration product in which customers can diversify their sustainability portfolio through planting trees, restoring wildlife habitats, and projects that developing other carbon sinks. Other services we found retailers providing include support services such as public relations and application assistance for various government or other programs that support the purchase of these products.³¹ Of course, not all of these services are restricted to larger-use customers. Some of these residential customers' products were identified above by regulators in New York and Texas. One example from Texas is Reliant Energy's suite of CE products and services for residential customers which includes two different wind products (month-to-month and annual product) as well as Heat-Relief products based on deviation of temperature from the average during summer (this was offered in Houston).

Retailers, as well as other demand response providers, are also incorporating demand response products, such as the Load Acting as Resource product provided in Texas which allows customers to provide certain ancillary services into wholesale markets.³² Other demand response program such as energy efficiency/load management services were found to be provided. These may include facilities upgrades, infrastructure outsources (e.g., thermal products), on-site generation, financing, and measurement and verification services.

³⁰ "Spotlight: C&I Retailers Green Up," *Retail Energy Foresight*, September/October 2007.

³¹ Service descriptions can be found through public data sources such as the retailer's web site.

³² Load acting as a Resource allows customers to provide capacity for a payment.

Table 2: Clean Energy Products*

| Retailer | Renewable Energy/RECs | Demand Response | Energy Efficiency | Carbon Footprint |
|-----------------------------|----------------------------------|----------------------------|------------------------------|-----------------------------|
| Ameren Energy Marketing | ● | | | |
| APS Energy Services | ● | | ● | |
| BlueStar Energy Services | ● | | | |
| Champion Energy LLC | ● | ● | | |
| ConEdison Solutions | ● | | ● | |
| Constellation NewEnergy | ● | ● | ● | |
| Direct Energy | ● | ● | ● | |
| DPL Energy | | | ● | |
| Exelon Energy | ● | | | |
| First Choice Power | ● | | ● | |
| FirstEnergy Solutions | ● | ● | ●+ | ●+ |
| Hess Corp | ● | ● | ● | |
| Hudson Energy Services | ● | ● | ● | |
| Integrus Energy Services | ● | ● | ● | |
| Liberty Power | ● | ● | | |
| MidAmerican Energy | ● | ● | ● | |
| NYSEG Solutions/Energetix | ● | | | |
| Reliant Energy | ● | ● | ● | |
| Pepco Energy Services | ● | | ● | |
| Sempra Energy Solutions | ● | ● | ● | |
| Shell Energy Trading | ● | ● | | |
| Strategic Energy | ● | ● | | |
| SUEZ Energy Resources | ● | ● | | |
| TXU Energy | ● | | ● | |
| TransCanada Power Marketing | ● | | | |

* Adapted from: "Spotlight: C&I Retailers Green Up," *Retail Energy Foresight*, September/October 2007, p. 8
and updated based on authors' research
+ Offered by subsidiary.

3. Pricing Products

As noted above, one of the key expected benefits of competitive markets are innovative and diverse portfolio services such as hedged products and other energy price management tools. Many of the retail products that were reviewed for this paper include a wide range of hedged products. We found that retailers are providing services tailored specifically for customers along several different product characteristics such as degree of price stability, price level, budget management and value. Many of the companies we surveyed provide products combine nearly every possible combination of market pricing and fixed pricing and combinations of the two. In addition we observed that retailers are providing real-time and day-ahead products. We also observed products that are indexed to pricing indices (e.g., gas price indices, standard utility offer or electric spot markets) and products that allow customers to purchase blocks of energy. Hybrid products that combine some level of market flexibility with a degree of pricing certainty were also found to be offered. In addition, retailers will also provide different degrees of price certainty on all services including congestion costs, capacity charges, line losses, other ancillary services as well as transmission and distribution charges. Indeed retailers are offering customers

a range of products from one similar to the traditional bundled utility service to products that are completely unbundled and energy is priced at a real-time or day-ahead index.³³

4. Other Energy-Related Services

Retailers are also providing a set of diverse services including customer energy portfolio management, risk management consulting, strategic energy sourcing, managing utility information and demand management consulting services. Many of these services utilize new and innovative technologies, such as web-based auditing and energy management software. These energy management tools are designed to:

- § Provide for customer budgeting and forecasting of energy expenditures
- § Provide customers an understanding the market forces behind energy prices
- § Provide insight into energy usage through a detailed set of data and informational products
- § Help lower operational and personnel costs associated with energy management
- § Eliminate unwanted surprises in energy bills
- § Identify anomalies in energy usage, such as equipment malfunctions.
- § Benchmark customer's facilities

One example is the eMiner® product (www.eminerllc.com).³⁴ This product uses internet technology to interface with meters live data feeds and process control systems. The product coordinates real-time meter data with real-time price signals and provides for integration of these data with building process controls. This allows customer's to more effectively manage energy usage, monitor the utility and participation in demand response programs.

C. Restructured Markets Are Continuing to Evolve

While this report shows that retail markets are providing varied products and using innovation to bring value to consumers, retail markets are still in the beginning stages of development. Many observers point to slow growth of retail electric markets as proof of the failure of the competitive experiment. It is important that policymakers when judging the success of markets understand that many transition periods have just recently ended or are still in the final stages in many jurisdictions. Furthermore concerns over price increases have tended to

³³ These service offerings were found by reviewing the public advertizing and web sites of retail suppliers. More tailored products are also offered, but, by definition, these products are customer-specific. A sampling of web sites accessed include: www.newenergy.com; www.strategicenergy.com; and www.reliant.com;

³⁴ Again, this is but one product on the market. For the sake of brevity we have not attempted to include all of these types of products in this review.

focus policymaking on fixes that address the short-term political issues. Some of these fixes will have implications long after the short-term pressures subside. In addition, there are still many barriers and distortions that have been introduced by regulations and legal structures. Retail competition has not been embraced by all jurisdictions, and although only a select few states have turned away from retail competition, no new states have embraced retail competition since the late 1990s. This presents challenges to retailers in the electric industry that are not faced by other retailing entities.³⁵ In this section we review the evidence concerning retail electric markets outside the United States that have been shown to be effective in providing benefits to consumers through innovation products and services. In addition, this section will review the promise of new technologies, such as advanced metering, in promoting retail electric competition and bringing the benefits of varied service offerings to consumers.

1. Certain Retail Electric Markets Outside the US have been Effective at Providing Consumer Benefits through Innovative Products and Services

As has been shown retailers are providing creative solutions to customers' energy and energy-related needs. Concerns over retail market evolution focus on the lack of options provided to small customers, including the residential class. However, there is evidence that competition can provide innovative services. Some of that evidence is provided with respect to markets in New York and Texas. However, this is also evidence from other markets. For example, the Nordic markets of Sweden, Finland and Norway show that, in the absence of price controls and other restrictions on contracting, competition and innovation have become commonplace.³⁶ The number and variety of contracts offered to residential customers is quite remarkable. In Sweden, for example, the market is thick for spot, one, two and three year contracts.³⁷ In addition, there is evidence of innovation in the residential market including contracts that provide electricity for a fixed amount irrespective of usage, contracts that have options to switch to current pricing (analogous to rate-bump CDs offered by many US banks) as well as customer service innovations.³⁸ Another example is South Australia. A recent report by NERA for the regulatory body found that firms were competing on both price and non-price basis and that competition was expected to become stronger as the market evolved.³⁹

³⁵ For example, Amazon.com faces few restrictions in doing business across state lines and most of those are related to tax policy not the prohibition on obtaining customers in that state.

³⁶ See e.g., S. C. Littlechild, "Competition and Contracts in Nordic Electricity Markets, CWPE 0550 and EPRG 06, November 2005. Professor Littlechild is a former electricity regulator in the UK. It is interesting to note that residential customers have had open access rights for just over a decade, similar to many states in the US, but that tariffs for supply services offered by the incumbent suppliers are only lightly regulated, as opposed to the standard model in the US of implementing price caps.

³⁷ Littlechild *note 36*, Table 7. There are also offers for four and five years as well as shorter-term contracts such as three, six and eighteen months.

³⁸ Regulatory pressure caused the company offering the fixed payment product off the market due to concerns over energy efficiency and intra-class subsidization. This occurred despite the fact that the product was apparently quite popular with customers. Littlechild *note 36*

³⁹ See "Review of the Effectiveness of Energy Retail Market Competition in South Australia," Phase 2 Report for ESCOSA, prepared by NERA, June 2007.

2. Emerging Technologies will help Promote Retail Electric Competition

In the US many observers see a role for Advanced Metering Infrastructure (AMI) in promoting innovation in product offerings, especially for small customers.⁴⁰ AMI is often thought of in terms of its functionality, rather than specific technologies. For example, the California Public Utilities Commission defined a minimum AMI functionality as:

- § be capable of supporting a wide range of price responsive tariffs;
- § collect data at a detail level that supports customer understanding of hourly usage patterns and their relation to energy costs;
- § allow access to personal usage data such that customer access frequency does not result in additional AMI system hardware costs;
- § be compatible with customer education, energy management, customized billing, and complaint resolution applications;
- § be compatible with utility system applications that promote and enhance system operating efficiency and improve service reliability, such as remote meter reading, outage management, reduction of theft and diversion, improved forecasting, workforce management, etc.; and
- § be capable of interfacing with load control communication technology.⁴¹

A recent report by the Federal Energy Regulatory Commission staff points to AMI investment as an enabling technology.⁴² AMI could provide a platform through which retailers can offer a variety of services based on time of use, pre-payment, direct load control (e.g., thermostat control, A/C cycling), demand response programs. Eventually information products based on the data supplied by smart meters will allow customers the necessary information to control load and take advantage of time-variant pricing and participate in more and varied demand response programs. The control over energy decisions that consumers will begin to exert once they have better and more up to date (e.g., real-time) information will begin to create benefits that are customer specific (e.g., controlling costs of electric supply) and benefits that are enjoyed by the wider set of customers (through more efficient wholesale markets).⁴³ For example, customers will eventually be able to utilize home displays that connect the price of electricity with the consumption of electricity. This holds the promise of transforming the retail electric market where currently most consumers have little or no idea of the true cost of their energy decisions. As with other restructured or reformed markets, e.g., airlines, gasoline,

⁴⁰ AMI does not have a universal definition. In general, AMI refers to a system of “Smart Meters” connected by a two-way communications infrastructure to data collection and manipulation machines. Several states have made policy determinations on defining AMI including California, Texas and New York. Other restructured states are in the process of exploring AMI proposals. These include Illinois, Maryland, Delaware, Washington DC, and Ohio.

⁴¹ This is a summary of Appendix A of the May 18, 2005 ACR in A.05-03-016 found in CPUC Decision 07-07-042 (7/27/2007)

⁴² “Assessment of Demand Response and Advanced Metering,” FERC Staff Report, Docket AD-06-2-000, August 2006, Washington, DC.

⁴³ There are several studies that attest to the general benefits to all consumers of price sensitive demand. See FERC Staff Report at note 42 and the various references found within.

securities, natural gas, creating more informed consumers creates more intelligent consumption decisions.

III. RESTRUCTURED RETAIL ELECTRIC MARKETS MEET CUSTOMERS' NEEDS IN INNOVATIVE WAYS AND ARE PREFERRED TO REGULATED MARKETS

In the previous section we reviewed the evidence for innovation using actual market data. In this section we will describe the reasons why it is reasonable to believe that markets are likely to provide benefits to consumers from innovation. Indeed, it is no understatement to suggest that the modern capitalist economy thrives largely due to the changes in technological opportunities over time. Innovation is often misconstrued as solely the purview of the engineer or scientist. However, in an economic and practical sense, innovation has a much broader definition. Innovation concerns the commercialization of new products, gadgets or technologies, and includes the management and marketing innovations that provide new ways of delivering and packaging services to customers.⁴⁴ It also includes the diffusion of innovation services, management techniques and services from one market to another.⁴⁵ In this section we will review the ways that markets meet customers' demands through innovative means. We will compare that to the mechanisms and behavior of regulated markets. We find that restructured markets are more apt to provide innovation relative to regulated markets.

A. Restructuring of Retail Electric Markets Holds the Promise of Promoting Innovation and Consumer Welfare

For the better part of the twentieth century academic economists and public policy experts have studied innovation and its relationship to the degree of competition. The results of those studies generally conclude that interfirm rivalry (i.e., competition) is conducive to innovative behavior.⁴⁶ It was the economist Joseph Schumpeter who is often credited with popularizing the important role technological change and innovation has in transforming economies, advancing economic growth and expanding consumer welfare. That this capitalist process is shaped by the rivalry between firms for new markets, new equipment, new methods of communication and marketing, new financial instruments as well as new organizational methods and management is by now well accepted. Indeed one of the central benefits ascribed to the

⁴⁴ Economists recognize a difference between *invention* and *innovation*. Invention is the discovery of something novel that did not exist before. Innovation is an economic act turning invention into economically viable products and services. See e.g., W.M. Cohen and R.C. Levin, "Empirical Studies of Innovation and Market Structure," Chapter 18 in R. Schmalensee and R. Willig (eds.) *Handbook of Industrial Organization*, pp. 1060-1107, 1989.

⁴⁵ One need only review past issues of the *Harvard Business Review* to appreciate the importance of management innovations.

⁴⁶ See e.g., M.I. Kamien and N.L.Schwartz, *Market Structure and Innovation*, Cambridge University Press, Cambridge, UK, 1982. Studies of market structure and innovation were spurred by Joseph Schumpeter's contention that monopoly rents were needed to provide the impetus for innovative behavior. See e.g., J.A. Schumpeter, *Capitalism, Socialism and Democracy*, Harper Brothers, New York, 1942.

reform and restructuring of previously regulated markets is the ability of different suppliers to innovate in order to meet demand in more effective ways.⁴⁷

The need to satisfy consumer demand leads firms to focus on niche markets or broader markets depending on the firm's core competencies. This dynamic nature of competitive markets transcends the naïve view of competition that is based solely on price. Price competition, while still important, can often obscure the value of products and services over time. For the example of the mobile telephone one could ask: What is the value of the mobile telephone today compared to thirty years ago? Since that product did not exist thirty years ago in any commercially viable form it is difficult to make a comparison.⁴⁸ In addition, even if a product or service did exist, changes in the product or service over time may make simple price comparisons irrelevant. For example, over the past two centuries the change in the price of lighting, when evaluated as the change in the price of a light bulb, will vastly *overstate* the change in the true price of the service provided (i.e., illumination). This will consequently vastly *understate* the rise in living standard as a result of the lowering of the price of illumination.⁴⁹ Another obvious example is the automobile. An automobile produced today that has a modern computer controlled engine and a more comfortable interior is in many ways a vastly superior product to automobiles produced twenty years ago. If the price, even in real terms, is higher today than it was twenty years ago, does that mean the automobile markets are not competitive or do not serve consumer demand effectively?⁵⁰ Clearly there are innovations that have made certain products substantially *better* over time. This creates wealth by providing consumers with higher levels of satisfaction from consuming these goods or the services provided by the good.

In addition, in a dynamic market place the evolution of the market is often hard to predict as technological change can cause products and services to evolve along lines that could not have been contemplated. One need only think of the direction and speed of technological change in areas such as computer software, hardware and network communications. These every day products and services were almost unthinkable to most people only twenty years ago. Innovation and invention can also arise from pure serendipity. Obvious examples come from the pharmaceutical industry. Drugs produced to treat one malady often turn out to be better at treating another. Another example of pure luck is the discovery of penicillin. This discovery is said to have occurred through a chance set of circumstances that allowed mold to grow with

⁴⁷ The relationship between the degree of competition and innovation remains a complex one. Innovation is affected by many industry-specific issues such as tastes and preferences, technological opportunity and the ability to appropriate the gains from innovation. *See e.g.*, W.M. Cohen and R.C. Levin *note 44*.

⁴⁸ Certainly one could attempt to estimate the opportunity cost of not having a mobile phone in terms of lost time, expended resources and other costs required to make land line calls. For a discussion of the value of new products see W. Y. Oi, "The Welfare Implications of Invention," in T.F. Bresnahan and R.J. Gordon (Eds.), *The Economics of New Goods*, National Bureau of Economic Research, *Studies in Income and Wealth*, Vol 58, pp. 109-142, 1997.

⁴⁹ *See e.g.*, W.D. Nordhaus, "Do Real-Output and Real-Wage Measures Capture Reality? The History of Light Suggests Not," in T.F. Bresnahan and R.J. Gordon (Eds.), *note 48*, pp. 29-66.

⁵⁰ *See e.g.*, D. M.G. Raff and M. Trajtenberg, "Quality-Adjusted Prices for the American Automobile Industry: 1906-1940," in T.F. Bresnahan and R.J. Gordon (Eds.), *note 48*, pp. 71-108. For an earlier discussion of prices in the automobile industry *see* A. Court, "Hedonic Price Indexes with Automobile Examples," *The Dynamics of Automobile Demand*, General Motors, Detroit, MI, pp. 99-117, 1939.

unusually high antibacterial properties.⁵¹ Other examples can be found, and perhaps are even prevalent, in nearly every facet of human endeavor.⁵²

Finally, diffusion of innovations either from other markets or through greater commercial penetration is another source of creative approaches to serving customers' needs. One example is the use of jet engine technology in electric generation markets. Another example is the trading of financial products and services. Electricity, as late as the mid 1990s, was largely traded through regulated tariffs based on cost of service methodologies. Financial innovations, such as options, forwards, futures, and other more exotic financial contracts have diffused into the electric market. These products are all, in some sense, a way of transparently trading and valuing insurance—a process that was embedded in traditional ratemaking thereby obscuring its value. While many commodity markets have been utilizing innovative financial products for years, diffusion of these innovations into the electric market is recent and is directly linked to liberalized market rules.

All of this discussion concerns a dynamic version of the competitive process that is now thought to be the engine that drives economic gains over time.⁵³ There is no clearer statement of this reality than that of Joseph Schumpeter:

But in capitalist reality as distinguished from its textbook picture, it is not...[price] competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization...competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their lives.⁵⁴

Here Schumpeter is describing a Darwinian struggle between firms. This struggle is the foundation through which dynamic gains can be obtained. This is not the picture of a static world in which firms compete on price alone and have little or no interest in strategically out maneuvering other firms. Rather it is the picture of an ever changing world through which firms take risks. Some firms live, some die, but in the end it is the evolution of the marketplace and the replacing of old ways with new ways that really matters for promoting economic growth.⁵⁵ Surely this picture of competition is more complex than the comfortable world of static markets where consumers need not make intelligent choices and firms need not compete for consumers'

⁵¹ See e.g., J. Waller, *Fabulous Science: Fact and Fiction in the History of Scientific Discover*, Oxford University Press, Oxford, UK, 2002.

⁵² See e.g., W.M Bundy, *Innovation, Creativity and Discovery in Modern Organizations*, Quorum Books, Westport, CT, 2002.

⁵³ That this relatively well accepted view of the competitive process has not been well communicated by economists and other analysts to the broader public has been recognized by some authors. See e.g., A.M. Diamond, Jr. "Schumpeter's Creative Destruction: A Review of the Evidence," Department of Economics, University of Nebraska at Omaha, 2006, working paper.

⁵⁴ Schumpeter, *note 46*, p. 84.

⁵⁵ See e.g., J. Sundbo, *note 5* or W.J. Baumol *The Free Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*, Princeton University Press, Princeton, NJ, 2002.

patronage. Nevertheless it is difficult to dispute that, on balance, it is this messy and complex world of dynamic competition that brings about the changes in economic circumstance that modern people have come to expect.⁵⁶

While retail electric market competition is still in its infancy and the potential for this Schumpeterian-type competition is only just beginning, we need only look to other retailing services in the United States to find examples of innovative approaches to retailing. These examples include retailers that have lowered the marginal cost of retailing through the adoption of new technologies and new management techniques (e.g., Wal-Mart) or those that have created a more convenient method of shopping utilizing new technology (e.g., Amazon.com).⁵⁷ It is interesting to note that, at least in these two examples, the business models adopted by these two firms were totally new and in many ways counterintuitive.⁵⁸

Regulatory changes, especially those in entry-restricted markets such as public utilities, are generally driven by major disruptions in the allocation of the relative benefits of existing institutions. Certainly natural gas, electric and telephone markets fit this characterization.⁵⁹ In the electric markets much of the change in services and pricing have only come about as a result of either a response to competition or cost shocks such as in the 1970s.⁶⁰ By-pass rates, demand-side management and conservation programs were either the result of Federal or state policy or used as a method to ward off competition.⁶¹ In either case the implicit resistance to change that is embodied in the regulatory process and the traditional utility mind set limits the benefits that customers can hope to receive from innovation.

⁵⁶ There is also little doubt that modern capitalism and the attendant choices that are required by the economic players in the modern, dynamic economy have altered society in many ways. See e.g., E.C. Rosenthal, *The Era of Choice: The Ability to Choose and Its Transformation of Contemporary Life*, The MIT University Press, Cambridge, MA, 2005

⁵⁷ We are simplifying here for purposes of exposition, there are other aspects of the retailing business that these firms have successfully integrated into their business models.

⁵⁸ Wal-Mart's model of growing from rural areas seemed to contradict conventional wisdom. See e.g., P. Ghemawat, K.A. Mark, and S.P. Bradley, "Wal-Mart Stores in 2003." Harvard Business School Case Study No. 9-704-430, January 2004. In the case of Amazon.com many observers doubted the ability of the business model to produce sustainable earnings. See e.g., M.S.H. Heng, "Rethinking the Strategy of Amazon.com," University of Amsterdam, Research Memo 2001-7, Amsterdam, The Netherlands, 2001.

⁵⁹ See e.g., P. L. Joskow, "Restructuring, Competition and Regulatory Reform in the U.S. Electricity Sector," *Journal of Economic Perspectives*, 11(3), pp. 119-138, 1997 (electric market) or P. McAvoy and S. Breyer, *Energy Regulation by the Federal Power Commission*, Brookings, Washington DC, 1974 (natural gas).

⁶⁰ There is a large literature on time of use pricing and customer response. See e.g., M.J. King, K. King and M. Rosenzweig, "Customer Sovereignty: Why Customer Choice Trumps Administrative Capacity Mechanisms," in S. P. Voll and M.J King (Eds.) *The Line in the Sand: The Shifting Boundary between Markets and Regulation in Network Industries*, NERA Economic Consulting, White Plains, NY, 2007 or "Customer Response to Electricity Prices," EPRI Report 1005945, Palo Alto, CA, 2001.

⁶¹ While time of use pricing, including real time pricing has been a viable option, at least for large customers for many years, even today the only jurisdictions that require real-time pricing for large customers are those that have restructured retail markets.

B. Regulation Inhibits Innovation to the Detriment of Consumers

Regulation of electric utilities has often been rationalized on the basis of both legal theory and economic consequence. In the early years of regulation in the United States the legal system began to develop a common understanding of regulated industries as being “clothed in the public interest.” While this legal concept was somewhat fluid initially, being applied to many different industries, the US Supreme Court finally drew a tight boundary around those firms that could be considered sufficiently affected with the public interest.⁶² Franchised utilities, due to the contractual nature of the franchise, were considered to be prime candidates for regulation. Economically, electric utilities were said to hold natural monopolies (i.e., one firm could produce at a lower cost than many firms) and therefore regulation was necessary to prevent monopoly pricing and the associated loss in overall welfare.⁶³ However, essentially from the beginning of the regulation of public utilities there was a concern over the incentives inherent in the regulatory system.⁶⁴

There are certain specific aspects of the regulatory environment that inhibit innovation, despite the best efforts of regulators. For example it has long been argued that regulation, through its adjudicatory nature, is designed to mitigate change whether caused by technical change or other factors.⁶⁵ Regulatory innovations, such as restructuring policies, are also often thwarted by the regulatory environment. While many of these policy innovations have spillover effects, the regulatory environment is often hostile to new and innovative policies.⁶⁶ One example may be depreciation policies employed under regulation which slow capital turnover through artificially long depreciation schedules.⁶⁷ The nature of the political process and the legal requirement that all consumers be treated the same has also stymied the innovative process and created an environment that has largely left the customer out of the process. A cruel irony given that the purpose for regulation was ostensibly to promote customer welfare. Profit regulation itself has been blamed for distortions in the firm's input choices and for the promotion of X-inefficiency (i.e., production that does not minimize costs).⁶⁸ This is no more obvious than in the

⁶² See e.g. A.E. Kahn, *The Economics of Regulation*, MIT Press, Cambridge, MA, pp. 3-11, 1988.

⁶³ This is a simplistic discussion of the evolution of regulation as it had many dimensions. Other issues certainly played a factor including the avoidance of “wasteful competition,” the protection of incumbent utilities' profits, the demand for regulation by politically powerful pressure groups, and the recognition of the special characteristics of utility services. See e.g., A.E. Kahn note 62 for more discussion of the evolution and rationale for regulation. Also see K.A McDermott, C.R. Peterson and R. C. Hemphill, “Critical Issues in the Regulation of Public Utilities in Wisconsin,” *Wisconsin Policy Research Institute Report*, 19(3), pp. 1 -69, 2006.

⁶⁴ See e.g., R. Hale, *Valuation and Ratemaking: The Conflicting Theories of the Wisconsin Railroad Commission, 1905-1917*, Columbia University Press, New York, 1918.

⁶⁵ See e.g., B.M. Owen and R. Braeutigam, *The Regulation Game: Strategic Use of the Administrative Process*, Ballinger Press, Cambridge, MA, 1978

⁶⁶ There is a large literature that focuses on policy innovations and spillover effects from these innovations. See e.g., J.R. Tyran and R. Sausgruber, “The Diffusion of Policy Innovations,” Universität St. Gallen, Switzerland, Department of Economics, Discussion Paper 2003-14. 2003.

⁶⁷ See W.J. Baumol, “Optimal Depreciation Policy: Pricing the Products of Durable Assets,” *Bell Journal of Economics*, 2(2), pp. 638-656, 1971.

⁶⁸ See e.g., H. Averch and L. Johnson, “Behavior of the Firm under Regulatory Constraint,” *American Economic Review*, 52(5), pp.1052-1069, 1962; W.J., Baumol and A.K. Klevorick, ‘Input Choices and Rate-of-Return

debate over performance-based or incentive-based regulation that has been simmering for over thirty years.⁶⁹ The cost-based regime in place for most regulated utilities is also said to inhibit cost reducing innovation. This can occur if cost reducing innovations create supernormal profits. In a market environment such supernormal profits would cause firms to try to exploit all possible cost-reducing innovations. However, in a profit-regulated world the regulator often cannot distinguish between profits that are due to exploitation of innovations and profit that is the concern of regulation. The default approach is often to remove all supernormal profit thereby destroying the incentive firms have to exploit such innovations.⁷⁰ Furthermore, the implementation of regulation may create an imbalance in the adoption of new innovations.⁷¹

Finally, regulation through the administrative process places a focus on cost recovery as opposed to demand satisfaction.⁷² A corollary to this concern is the price setting mechanism itself. Regulation, almost without exception, does not price electricity such that customers see the true resource costs (i.e., marginal costs) that are imposed on the system. These pricing inefficiencies, which may have been somewhat minimal in the past, are beginning to become critical.⁷³ Going back to the example of time of use pricing, its slow adoption by states, and largely only as a result of the Federal government prompting such changes, is suggestive of the resistance to innovation by the institution of regulation. Furthermore, regulation is often preoccupied with the increased risk created from technological obsolescence.⁷⁴ Authors have

Regulation: An Overview of the Discussion," *Bell Journal of Economics and Management Science*, 1(2), pp. 162-190, 1970; R.M. Isaac, "Fuel Adjustment Mechanisms and the Regulated Utility Facing Uncertain Fuel Prices," *Bell Journal of Economics*, 13(1), pp.158-169, 1982; and P.L. Joskow and R.L. Schmalensee, "Incentive Regulation for Electric Utilities," *Yale Journal on Regulation*, 4(Fall) pp.1-49, 1986.

⁶⁹ See e.g., J.J Laffont and J. Tirole, *A Theory of Incentives in Procurement and Regulation*, the MIT Press, Cambridge, MA, 1993.

⁷⁰ There is a countervailing incentive through regulatory lag (i.e., the time between rate cases). The power of the regulatory lag incentive will increase with the length of the time period between rate cases. See e.g., G.A. Comnes, S. Stoft, N. Greene and L.J. Hill, "Performance-based Ratemaking for Electric Utilities," Lawrence Berkeley Lab, Berkeley, CA, LBL-37577, UC-1320, 1995.

⁷¹ See e.g., R. Stoner, "Diffusion of Technological Innovations among Privately Owned Electric Utilities:1950-1975," in H. Trebing (Ed.), *Issues in Public Utility Regulation*, Michigan State University Press, E. Lansing MI, 1979.

⁷² While the number of textbooks that discuss the relationship of demand to utility pricing and product design is large and traces back to the beginning years of regulation, it is interesting to note that it was not until the 1970s that regulatory bodies in the US seriously entertained the notion of pricing based on economic principles (i.e., marginal cost).

⁷³ Customers have for many years been conditioned to expect prices to remain fixed even in periods of extremely high cost. This has caused peak demand to continue to grow with no signal to customer concerning the cost of this growth. This situation, combined with the apparent increasing cost of base load generation, will continue to provide incentives to the market to build gas-fired power plants. This has two main implications. First, as gas-fired generation continues to compete with natural gas local distribution companies the real price of natural gas will likely continue to increase. Second, as gas-fired generation becomes a larger portion of regional generation portfolios, customers will see higher average electricity bills.

⁷⁴ P. Garfield and W. Lovejoy, *Public Utility Economics*, Prentice-Hall, Englewood Cliffs , NJ., p. 122, 1964.

explored the need to offset this risk as a means of inducing regulated firms to adopt innovations.⁷⁵

This debate addresses two overarching issues. Since regulation cannot perfectly substitute for competition, the spur of competition to incent innovation can be absent in a regulatory environment.⁷⁶ Also, profit regulation, by its nature can dampen the incentive to innovate by restricting future returns from innovative activity.⁷⁷ Therefore, restructuring polices should provide a more conducive environment in which innovation can occur. However, before moving on to an examination of restructured retail markets, we need to discuss how competitive markets create product variation by placing the focus on customers.

C. Competitive Markets and Product Variation: The Focus on Customers

Product variation or product differentiation comes in many forms. Products and services may vary in price, quality, flexibility of consumption or they may be bundled with services that are beyond commodity provision. Differentiation of products is, in fact, common outside of regulated markets. For example, automobiles can be differentiated by color, engine size, comfort level or any number of other characteristics.⁷⁸ Mobile phones provide another example of product differentiation through color, functionality and many other characteristics, although the phone's purpose is still to provide a method of remote communication. These examples, and many others, are commonplace in our everyday lives. Economists have noted several key "facts" concerning product differentiation:⁷⁹

- § Many industries produce a large number of similar, but differentiated products;
- § Similar products produced by different firms are rarely identical;

⁷⁵ V. Stagliano, *A Policy of Discontent: The Making of A National Energy Strategy*, Pennwell, Tulsa OK, p. 168, 2001.

⁷⁶ Many authors will claim that the role of regulation is to be a substitute for competition. While at a high level that is true, if a natural monopoly exists, competition, by definition, cannot occur and regulators struggle to provide incentives for competitive behavior on the part of the regulated firm. In addition, the market also plays an important role in selecting firms to continue operation. *See e.g.*, A. Alchian, "Uncertainty, Evolution and Economic Theory," *Journal of Political Economy*, 58(3), pp. 211-221, 1950.

⁷⁷ M. Farris and R. Sampson, *Public Utilities: Regulation, Management and Ownership*, Waveland Press, Inc. Prospect Heights, Il., pp. 314-17, 1984.

⁷⁸ Any one who has purchased a car in recent years will notice that the cup holder has become one of the characteristics that firms use to differentiate products. While the cup holder has no affect on the speed of the car, the length of its life, or any other characteristics that changes the fundamental service provide by the car (i.e., transportation), this characteristic of the product is apparently quite valuable to consumers. One interesting theory suggests that cup holders may provide people a sense of child-like safety due to the association with warm liquids. *See Cultural Anthropologist Dr. G.C. Rapaille* quoted in M. Gladwell, "Big and Bad: How the SUV Ran Over Automotive Safety," *The New Yorker*, pp.28-33, January 12, 2004.

⁷⁹ This list is summarized from: B.C. Eaton and R.G. Lipsey, "Product Differentiation," Chapter 12 in R. Schmalensee and R. Willig (eds.) *Handbook of Industrial Organization*, pp. 723-768, 1989. It is important to understand that product diversity is a complicated economic issue to fully analyze and we can only touch on some overarching themes in this paper.

- § The set of products produced by firms tend to be a subset of all the possible products;
- § Firms may produce a large set of differentiated products;
- § Any one consumer tends to purchase only a small subset of the available products;
- § Consumers perceive the differences among products to be sufficient to determine approximate agreement on the substitution between products;
- § Tastes vary among customers and this variance cannot be explained by differences in incomes.

Now consider these facts in the context of a traditional regulated utility in which products and services tend to be “plain vanilla” designed for, largely, a (non-existent) average customer. Yet energy consumers do in fact have varying tastes and preferences, just as mobile phone or automobile consumers. Electric consumers can be differentiated along many different lines. It will be useful to illustrate the typology of electric customers. For example, one author suggests customers may be delineated as follows:⁸⁰

- § Price Buyers
- § Convenience Buyers
- § Security Buyers
- § Principled Buyers
- § Institutional Buyers
- § Value Buyers
- § Bottom Line Buyers

While one might be able to further delineate customers at a more granular level, this approach provides a useful illustration for further discussion. The message here is that different customers have different tastes and preferences and differing needs. Product differentiation is an attempt by firms, in a constant struggle with one another, to satisfy these needs. For electric service, there are various dimensions or characteristics of electric service that will appeal to

⁸⁰ See B. Prindle, “Stepping Over the Line: What Do Your Competitors’ Customers Really Want?” *Proceedings of 1996 EPRI Conference on Innovative Approaches to Electricity Pricing: Managing the Transition to Market-Based Pricing*, p. 27-1. A more recent discussion of the use of market research in competitive electric markets can be found in M.V. Williams and A.A. Awad, “Use of Market Research in a Competitive Environment,” in A. Faruqi and K. Eakin (Eds.) *Electricity Pricing in Transition*, Kluwer Academic Publishers, London, UK, 2002.

different customers. Pricing, for example, can be based on nearly any approach. This may include volatile prices e.g., hourly to less volatile prices.⁸¹

Figure 1 presents a simple diagram illustrating the trade-offs that suppliers and customers face. For suppliers we can think of cost in this graph as the price of providing service. On the customer side we can think of cost as the price of providing “self-insurance.” Therefore, as the risk of a product goes down, the customer faces less cost associated with insuring itself against adverse price swings. Alternatively, as the risk goes down the customer purchases insurance through the price of the product. For example, if a customer were on real-time pricing the risk of price changes is high and the cost to take actions to insure against adverse price changes is high. These costs may include the inconvenience of reducing consumption when prices are highest or cash costs of buying power when prices are high. It could also include the cost of investing in certain capital equipment, for example, a smart thermostat or a more efficient air conditioning unit or some other measure that is designed to lower the customer’s usage. For the supplier the story is somewhat different. A customer on real time pricing produces little risk of the cost of production exceeding the price as the supplier is likely charging a price that covers the cost in every hour. The opposite is true for a fixed price product. The supplier faces a risk that the contract price will not compensate the supplier for the insurance provided to the customer. This is an over simplification as other issues may come into play such as risk aversion on both the supplier’s and the customer’s part. However, the basic construct provides a model of the type of customers and the customer choice variables.⁸²

Other factors are also important in the decision to consume an electric product. These may include billing services, such as convenient payment or single bill payment, energy services, load control options, type of power and communications.⁸³ In addition, reliability, flexibility, customer service and even attributes of the suppliers, such as social commitments, financial stability and the alignment of visions.⁸⁴

To provide customers with products that serve their needs firms have to discern what customers want and how to serve those needs. More formally, market segmentation requires that each market is measurable, it is economic to serve; it is large enough to be profitable; and the products and services required match the supplier’s capabilities, i.e., core competencies.⁸⁵ This suggests that niche market players are likely to enter to serve one or a limited number of market

⁸¹ For a broad discussion of electric pricing in competitive retail markets *see e.g.*, A. Faruqui and K. Eakin (Eds.) *note 80*.

⁸² This is another reason why simple price comparisons fail to provide much, if any, insight. Pricing in a competitive market is dependant on the type of demand and how responsive that demand is to price as well as the amount of insurance that is embedded in the product choice. Customers that take service under cost of service regulated tariffs are not immune to changes in costs.

⁸³ *See e.g.*, M. Rufo and K. Train, “Using Choice Modeling to Understand Customer Preference: A Tale of Four Studies,” in A. Faruqui and J. R. Malko (Eds.), *Customer Choice: Finding Value in Retail Electricity Markets*, PUR, Vienna VA, 1999.

⁸⁴ *See* J. Ewing, “Is Anyone Listening?” in Faruqui and Malko (Eds.) *note 83*

⁸⁵ *See e.g.*, K. Bartkus “A Market-Oriented Approach to Electric Utility Strategy,” in Faruqui and Malko (Eds) *note 83*.

segments. By focusing on core competencies the supplier is more efficient at serving the targeted niches and providing customers the value added products that they want. This does not mean that all conceivable markets will have specialized providers. Customers may demand products that are economically infeasible to supply. However, sub-markets should be expected to change over time as innovation creates different cost structures and provides the opportunity to serve customers with new products and services.

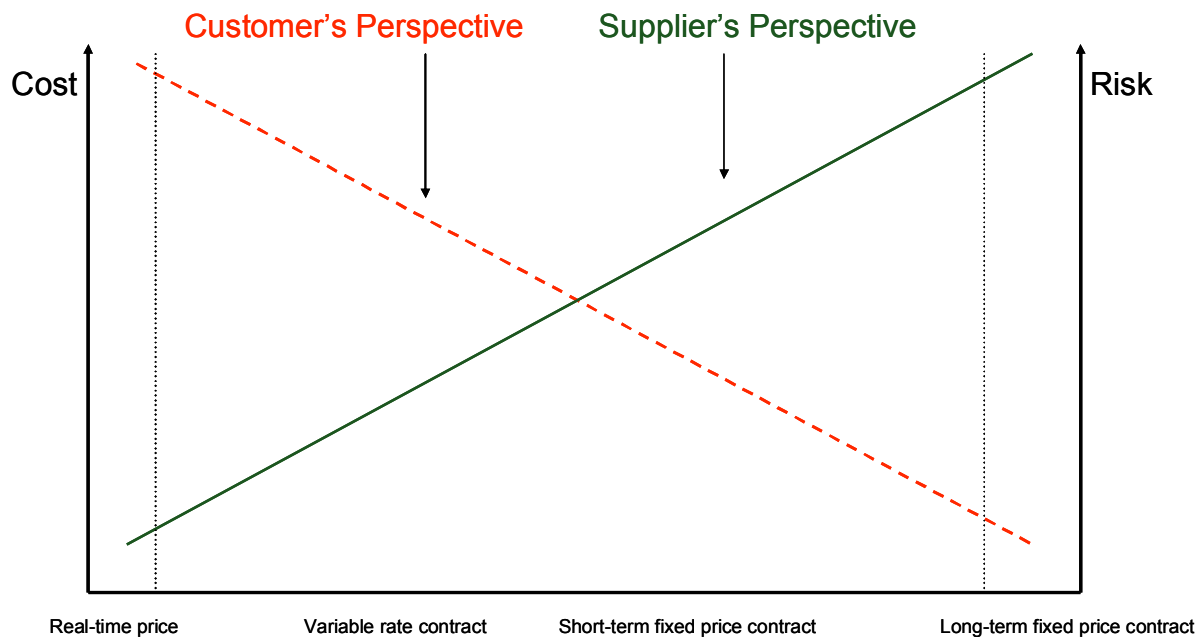


Figure 1: Electricity Pricing Costs and Risks⁸⁶

Regulated utilities generally segment markets by broad customer classes e.g., residential, commercial and industrial and potentially a few subclasses within each. This is done largely out of convenience for the regulatory body and the utility. It may also be done to promote understandability of tariffs for consumers. These objectives have been central to ratemaking and service provision in electric industry for many years.⁸⁷ Further, the rates designed for these classes are largely designed for cost recovery purposes and not for the purposes of rationing demand which is the function price plays in a market setting.⁸⁸ While generally there is no specific prohibition on regulated utilities segmenting markets, there is often reluctance on the part of utilities and regulators to allow much segmentation beyond the basic described above. This is often due to concerns over *undue* price discrimination. In addition, such segmentation

⁸⁶ This figure is reproduced from: K.A. McDermott, "Revitalizing the Regulatory Compact," presented at Center for Public Utilities, New Mexico State University, Santa Fe, NM, March 23, 2004.

⁸⁷ See e.g., J. Bonbright, *Principles of Public Utility Rates*, Columbia University Press, New York, NY, 1961.

⁸⁸ Despite the oft-invoked mantra of cost-based rates few standard utility tariffs are designed to reflect the economic costs of producing electricity.

would require utilities to spend resources on determining the different submarkets. In many cases this would raise questions about the legitimacy of the spending.⁸⁹

Simultaneously, these markets must overcome the lack of information and understanding of energy services on the part of typical consumers. There is an inertia created by decades of public policy that avoided the need for consumers to understand and take responsibility for energy consumption choices. This is a side effect of the traditional role prices played in the regulated marketplace as a cost recovery mechanism, rather than a mechanism that provides information to consumers. Billing based on monthly use with bills reflecting one month lags are a poor substitute for prices that reflect the market price in a real-time or close to real-time manner. Further, customers generally have not had to think about the attributes of service, they simply flip a switch. That is, some customers may not know that they are *value* or *bottom line* or even *principled* customers until they are faced with the choice and educated about the implications of these choices. Customers will need to familiarize themselves with the characteristics and attributes of the new services available. Customers may tend to focus on the most recognizable attribute first, namely price, but that may change for many over time with experience as they begin to understand their own consumption habits and the options available to them. Retailers provide a useful service in bringing this information to consumers and they have the incentive to do so in an innovative and relatable fashion.

D. The Benefits from Innovation Can Not be Ignored in the Review of Competitive Retail Electric Markets

As has been shown above, the technical, theoretical and empirical evidence tends to support the view that dynamic markets produce non-price benefits for consumers. In addition, these benefits can often far outpace the benefits from direct price competition. Regulation, as it is generally practiced in the US, tends to run counter to this dynamic approach to markets. Yet despite this conclusion, reviews of the success of reform efforts in regulated markets often ignore the benefits from innovation. This may be due to the difficulty in accurately measuring innovation and the benefits that arise from it. It may also be due to the nearly singular focus that has traditionally placed on the regulation of revenue levels (i.e., average prices). Perhaps because price is such a transparent measure, much of the focus of analysis of competitive retail and wholesale electric markets has been on price.⁹⁰ Nonetheless, failing to take into account such benefits can substantially understate the advantages of restructuring policies.⁹¹ Yet it is important to recall that in restructured markets firm's efforts are focused on satisfying demand either through more efficient means, e.g., innovative cost reducing measures, or by providing unique

⁸⁹ Regulators, quite naturally, find it difficult to judge whether a particular expense related to market segmentation is due to the legitimate reasons (i.e., serving customers more effectively) or other reasons that may run counter to the regulator's objectives. The competitive market solves this problem by allowing only those costs that provide value to consumers to be recovered through the market price.

⁹⁰ For example, in a ninety-plus page review of restructuring studies prepared for the American Public Power Association, the term "innovation" appears only eight times—three of these occur in one sentence! See J. Kwoka, "Restructuring the US Electric Power Sector: A Review of Recent Studies," APPA, November 2006.

⁹¹ See e.g., J.L. Guasch and P. Spiller, *Managing the Regulatory Process*, World Bank, Washington, DC., p. 12, 1999, and cites therein for a discussion of the systematic understatement of the benefits of regulatory reform due to the ignoring of dynamic gains from innovation.

and fresh ideas for products and services.⁹² Firms in competitive markets need to innovate in order to maintain or increase market share.⁹³ Firms do so by providing services that provide value. For example, thirty years ago it was almost unthinkable that a residential household would need more than one phone line. Today, it is unremarkable that many households have two land lines and several mobile phones. One can only conclude that consumers value these additional phones more than the price paid. So too in the retail electric market innovation in product and service offerings as well as bundling new services must be included in the review of these markets. Despite the stated objectives of many restructuring programs to promote innovations and pricing and service varieties, these objectives are often forgotten in the politically charged debates over price. However, ignoring such characteristics of restructured retail electric markets will tend to understate the benefits consumers gain from such reforms.⁹⁴

IV. CONCLUSION

Restructuring electric markets continues to provide better incentives for firms to provide creative and unique solutions for consumer's energy needs. Competition is already promoting innovation as firms struggle against one another to meet consumer's needs. In retail electric markets product variation, service innovations and application of new technologies are evolving as the reforms envisioned nearly a decade ago begin to promote competition. In some jurisdictions, retail markets are producing new and varied products and firms are applying new technologies as shown above. While many of the products and services reviewed in this report are provided to large-use customers, there is growing evidence from the US and worldwide that mass market customers can also benefit from the range and variety of products and services provided in a retail competition regime. Retail competition is also proving to be an effective tool in getting more and varied choices for clean energy into consumer markets.

Retail market evolution will require continuing regulatory support to improve market arrangements and avoid moving away from utilizing market mechanisms to allocate resources. While this often is a difficult choice in the face of increasing market prices, the rationale for continuing to support market and market processes remains as strong today as it has been at any time. Perhaps even stronger due to the tremendous cost pressures facing the entire electric

⁹² There have been studies of the connection between restructuring policies and efficiency gains in the generation markets. For example, electric generation plants in states that restructured the electric industry were found to obtain the largest productivity gains and those plants that were largely unaffected by restructuring, e.g., municipally-owned generation, experienced the smallest gains during the period of US restructuring. *See* N. Markiewicz, N. Rose and C. Wolfram, "Does Competition Reduce Costs? Assessing the Impact of Regulatory Restructuring on U.S. Electric Generation Efficiency," National Bureau of Economic Research, Working Paper No. w11001, Cambridge, MA, 2004. A similar correlation between generation efficiency and liberalization of the electricity market was found in European countries. *See* F. Steiner, "Regulation, Industry Structure, and Performance in the Electric Supply Industry," Department of Economics, OECD ECO/WKP(2000)11, Paris, France, 2000.

⁹³ A firm that has a monopoly, but is unregulated, may feel the same pressure to innovate as firms in more overtly competitive markets. The extent to which this occurs is largely an empirical question. The empirical results tend to suggest a U-shaped relationship between market structure and innovation with neither monopoly, nor perfect competition being socially optimal. *See e.g.*, Kamien and Schwartz *note 46*.

⁹⁴ *See e.g.*, J.L. Guasch and P. Spiller *note 91*.

industry today. Many regulators and policymakers are faced with difficult choices in today's ever changing energy markets.

Political pressure often creates objectives that are at cross purposes with the public interest. One example is the seemingly uncritically accepted assumption that default prices, and electricity prices in general, should be extremely stable.⁹⁵ However, even from a traditional cost of service viewpoint such pricing does not make sense. Electricity production costs can vary dramatically over the day and over seasons. This is not a new phenomenon. However due to poor pricing practices in the past and dramatic increase in global fuel prices the logic behind allowing prices to fluctuate closer to actual cost of service is perhaps stronger now than it has been at any time in the history of the electric industry. A second example of this unfortunate situation is environmental policy. In the coming years demand growth will require significant expansion of generation capacity in the US.⁹⁶ The unrestrained focus on setting prices at fixed levels for long periods of time is inconsistent with the objectives of legislators and regulators to provide for a more resource-efficient future. When customers are constrained in the choice to curtail demand in response to price or to buy varied and innovative clean power solutions, the goals set out for environmental policy, and to some extent, energy security, will be much harder to achieve. It is folly to believe that artificially low or leveled electricity rates will induce consumers to use less electricity.

Despite the struggles and challenges faced by the nascent competitive retail electric markets this report has provided empirical evidence that retail electric markets can provide benefits beyond simple price comparisons. Providing consumers access to new and innovative services certainly is one of the objectives for restructuring retail electric markets. Regulators and policymakers must take a broader view of retail markets and recognize that innovation is one of the key benefits—largely forgotten in many debates—of restructuring retail electric markets.

⁹⁵ While many observers have been critical of this assumption and indeed understand the need for time varying pricing, electricity pricing, especially for small-use customers, still tends to be focused on stability. *See e.g.*, Electric Energy Market Competition Task Force Final Report *note 3*.

⁹⁶ NERC has recently reported that peak demand grew faster in the last five years than the previous five years and its new 2015 forecast for peak demand has been revised upward for seven of its eight regions. *See e.g.*, "Interruptibles and direct-control cuts rising, but impact still pretty small, NERC reports," *Electric Utility Week*, 18-22, December, 3, 2007.

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Dr. Karl A. McDermott is a Vice-President in NERA's Chicago office where he specializes in public utility regulation. Dr. McDermott has advised many different clients in both the public and private sectors on issues regarding electric restructuring, market performance and performance-based regulation. He has also assisted the country of Poland with efforts to privatize and restructure the electric supply industry. Prior to joining NERA, he served as Commissioner on the Illinois Commerce Commission during the negotiation of the Illinois restructuring law. Dr. McDermott initiated the Commission's investigation into the alternative restructuring options and has lectured on numerous occasions on restructuring and utility pricing issues in the United States. Dr. McDermott is currently on the faculty of the Institute for Public Utilities at Michigan State University where he lectures at the Institute's Annual and Advanced Regulatory Studies programs. Dr. McDermott has also lectured extensively in Eastern Europe and South America on regulatory reform and restructuring and has published articles in *The Electricity Journal*, *Natural Gas and Electricity*, and has contributed to numerous book chapters and authored or co-authored reports for the Illinois Commerce Commission, the Edison Electric Institute, the US Department of Energy, the National Regulatory Research Institute as well as the governments of several eastern European countries. Dr. McDermott earned his Ph.D. in economics from the University of Illinois at Urbana-Champaign, a M.S. in public utility economics from the University of Wyoming and a B.A. in economics from Indiana University of Pennsylvania.

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