What's a Utility to Do?

Next-Generation Energy Services and a New Partnership to Serve Customers

SCUDDER PARKER
FRANCES HUESSY

November 2013

Vermont Energy Investment Corporation

veic.org

Tel: (802) 658-6060
Toll-free: (800) 639-6069

VEIC Headquarters:
128 Lakeside Avenue, Suite 401
Burlington, VT USA 05401

On the Threshold of a New Energy Era

The next generation of energy production and use will require a dramatic improvement in the energy industry's capacity to provide ongoing, independent, and trusted support to customers.

This improvement will mean that customers can invest in energy under a new energy utility structure that offers fully coordinated services dedicated to meeting their energy needs. This will require interdependent functions between utilities and other entities providing customer-engaged energy services. These interdependent functions can harness the immense potential for meeting our energy needs in a way that maximizes benefits to the customer, our energy systems, and society.

There is an explosion of opportunity for new types of utility service to customers. If thoughtfully deployed as a comprehensive system, these services can fully engage utility customers, redefine the utility system, and realize the societal benefits of new strategies and technologies. This is a new utility model, to be sure.

The greatest challenge will be to identify new roles, responsibilities, and investment strategies that are consciously designed to maximize customer and societal benefits through the new business models, rather than simply pursuing "new revenue streams" for traditional utilities.

Doing this right will require deliberate, imaginative work on the part of all stakeholders..

IN THE COMING DECADE, how will energy be provided for our buildings, manufacturing, commerce, and transportation? We know the new face of energy delivery will have to involve more than traditional generation, transmission, and distribution. It will require partnerships among utilities, providers of efficiency and renewable energy services, customers, technology companies, and other emerging market players. Together, they will need to deliver new, customer-engaged services. This coming energy era will literally capitalize on customers' investments in their buildings and the energy choices they make. And this new energy era will change the profile of how energy is both produced and used.

The Vermont Energy Investment Corporation (VEIC) sees the new energy era as one characterized by "next-generation energy services," guided by core principles that will move us into a **sustainable, affordable, and resilient energy economy**. Traditional utilities have an opportunity both to change and to be leading partners in driving that change. But they will not be able, and they should not attempt, to do this on their own.

Policy makers, regulators, utilities, service providers, and customers can help shape and guide this change in ways that achieve significant economic and environmental gains. They can also build a strong, diverse, and innovative energy marketplace that provides solid support and lasting benefits to their customers.

What will the next generation of energy service look like? It depends on the extent to which we—those of us involved in the regulated energy industry—are bold enough to address the three related energy challenges of our time: climate change, energy security, and the volatility of both supply and price. And it will depend on the extent to which we are open to structural changes that accept and integrate disruptive and transformational technologies and capabilities.

It is essential that we tackle these issues in two settings. One is in the context of current utility regulatory policy and structure; the other is in the context *beyond* that structure. Particularly this latter context involves a new relationship among energy users and the growing array of energy innovators and providers. We need a new framework that recognizes and mobilizes the contribution that customer actions and investments can make in addressing the economic and environmental challenges of energy use. That framework needs thoughtful evolution. It also needs to be institutionalized so that it becomes a critical component of the new energy strategy. This will require a broader definition of utility *service.* Traditionally, *service* in utility-speak is primarily about generation and delivery. Essentially, *service* is about supplying customers with a line of energy from the power plant to the meter.

The broader definition—the next-generation definition—of *service* will involve intelligent, sustained support for customers as they make their energy choices and investments. This new definition will also involve support for energy markets as they respond to customer needs and market opportunities.

The energy future we envision is about *transformation,* not mitigation. It will not be enough simply to mitigate the adverse environmental and economic impacts of the current energy system, the current utility structure, and the prevailing approach to providing energy service.

We need to turn the utility system into an engine that drives a new, sustainable, affordable energy economy that reacts with resilience and innovation in a volatile energy marketplace.

If we want a new set of long-term benefits from our energy system, we will have to start now. We will have to identify the goals and define the desired benefits, and revise the current system to attain them.

Monopoly energy utilities were chartered to develop and deliver gas and electric energy resources at "just and reasonable" prices to consumers.[1] They were structured and regulated in part to realize the benefits of increased scale in investment and production and to lower the unit price of delivered energy. They have been pretty good at it. They have been rewarded for it. Although there have been significant changes in the industry, this is still fundamentally what they are chartered to do.

The energy future we envision is about transformation, not mitigation.

But "just and reasonable" prices are no longer an adequate *real* test to evaluate the costs and benefits of energy production and use to society. We have begun (often reluctantly, and always imperfectly) to quantify the environmental and economic effects of ever-increasing extraction and production costs of energy. These effects have increased dramatically with greater globalization of energy demand and supply. The structural changes that regulators and utilities might undertake to meet these challenges are essential to a serious discussion about the next generation of energy service. It needs to be a discussion that dwells on much more than an examination of the pros and cons of continuing to do what they are chartered to do.

Instead, we should be asking:

- What are the major potential benefits of a new model of energy production, distribution, and use?
- What are the essential utility functions to facilitate attainment of these benefits?

1 Just and reasonable rates are stipulations of the Federal Power Act, Section 205. It is the standard used by the Federal Energy Regulatory Commission (FERC) in guiding rate cases by public utilities. For more information, see Lawrence R. Greenfield. An Overview of the Federal Energy Regulatory Commission and Federal Regulation of Public Utilities in the United State. Washington, DC: U.S. Department of Energy. 2010. See http://www.ferc.gov/about/ferc-does/ferc101.pdf.

- How should utility charters be restructured to allow them to make new types of investments and to earn a reasonable return, consistent with attaining these benefits?
- What is the potential for the integration of gas and electric services to advance the desired benefits?
- What are the essential characteristics of a new utility business model?
- What energy services do customers need now and 20 years from now, and how should those services be delivered?
- What have we learned about what makes new, customer-engaged services successful?
- How do we assure that the essential utility functions and customer-focused services each realize their full potential?
- How do we assure that the essential utility functions and the resources provided by customer investment and action are coordinated to provide lasting benefits?

A promising new energy structure has five critical features:

1. It must provide affordable, reliable, safe, and adequate energy services.
2. It must halt current damage to the environment, reduce current impacts, and minimize future ones.
3. It must support a strong and durable economy.
4. It must help customers continuously improve the effectiveness and efficiency of their energy use and production.
5. It must provide benefits to all customer classes and provide affordable energy services to all customers—especially economically vulnerable customers.

Key Challenges to Energy's Next Generation of Service

The following observations suggest the scope of both the difficulties and opportunities currently before us.

What are the major benefits to be derived from a new energy model?

- **Investment in utility infrastructure drives most decisions about energy services to ratepayers.** Investor-owned electric and natural gas utilities still generally earn their margins on the equity investments they hold in infrastructure—lines, poles, pipes, and equipment. Increased sales of energy typically help them meet their return-on-equity targets. In both Investor-owned and customer-owned utilities, increased sales generally help lower the share of the rate attributable to fixed costs. Further, their financial incentive structure still primarily rewards equity investment in plant and equipment. Not surprisingly, when sales of energy decline, the customers' willingness and ability to pay the rates necessary for the utilities to sustain their revenue streams become a growing problem for utilities—and their regulators.[2]

- **Utilities are not in the business of addressing environmental issues, including climate change.** This is not what they were created to do. It is not surprising that electric and natural gas utilities lack a comprehensive, thoughtfully structured, and consistent incentive framework to address environmental issues in general or climate change in particular.[3] A significant amount of regulation has accumulated nationwide, typically with the intention of mitigating the adverse environmental impacts of specific forms of energy production, generation, and use. However, that regulation (even when utilities support it) is largely a sequence of attempts to "repair the leaks" in an old system. Since the regulatory approach is neither comprehensive nor dedicated to a systemic approach to the problems, regulation is generally perceived as an engine for "increasing costs." And it often has that exact effect, even as it provides measurable benefits elsewhere.

- **Distributed resource strategies are secondary to traditional, large-scale generation.** Electric and natural gas utilities are generally not expected to support the full array of strategies for distributed resources.[4] Even so, many of these utilities are providing energy efficiency services. And, in some measure, they are also supporting renewable energy, combined heat and power, and demand response strategies. These strategies frequently stem from policy mandates such as least-cost resource planning, energy efficiency requirements, system

2 This discussion suggests a consideration of utility decoupling of supply-side and demand-side services. For more on the topic of decoupling, see "What These Forces Mean for the Utility Industry," on p. 16.
3 Although climate change is currently at the forefront of much energy debate, obviously air quality challenges caused by criteria pollutants, for example, are part and parcel of the major environmental issues that are directly relevant to this discussion.
4 *Distributed resources* is a term that applies broadly to energy efficiency, customer-sited combined heat and power (CHP), on-site generation (including small-scale renewable generation), and other load control, load-shifting, and energy storage strategies that provide energy and load management and related options for customers and the energy system.

benefits charges, and renewable portfolio standards. Nevertheless, regulated utilities generally lack a clear incentive to give first priority to such strategies in their portfolios.

- **Utility resource accounting and utility regulatory oversight usually ignore or discount the value of non-energy costs and benefits**. This distorts the true value of distributed resources. Regulatory structures related to cost-effectiveness requirements in "screening processes" generally fail to require accurate accounting of costs and benefits related to non-utility, environmental, human health, and economic effects. The same can be said of corresponding legal frameworks. The under-valuing of distributed resources makes it impossible to create a level playing field for energy resource development. This results in systematically under-developed and under-used distributed resources:

- **Regional energy markets (including the regional transmission organizations / independent system operators [RTOs / ISOs]) are only just beginning to value energy efficiency, distributed generation, and demand response in addressing peak capacity needs.**

- **Non-wire alternatives (NWAs) for distribution- and transmission-constrained areas can be highly valuable to a transmission or distribution network.** This is because they provide capacity to a system. However, there is little incentive to recognize their value. Further, there is little incentive or institutional capacity to plan for or coordinate their implementation in a strategically focused manner. At the regional level, NWAs could provide real value to help avoid or defer transmission projects, but in most cases, the deck is overwhelmingly stacked against NWAs.[5]

- **Utilities are not expected to maximize the benefits of renewable energy and distributed resources generally.** Nor are they expected to improve the performance and power utilization factor of the electric system. This is true even in cases where doing so would provide enhanced reliability and economic performance—not to mention other benefits to the environment, energy security, and the economy.

- **There is no reward to utilities for taking a coordinated approach to improving the efficient use of the transmission and distribution system.** Doing so could control costs and provide capacity for strategic electrification by finding and promoting efficiencies and synergies between the natural gas (and other combustion fuels) and electricity systems.

5 See Watson, Elizabeth, and Kenneth Colburn, "FERC Order 1000 and the Case for Alternative Solutions." *Public Utilities Fortnightly,* April 2013. These authors (Regulatory Assistance Project, Montpelier, Vt.) observe: "No entity is obligated to propose or implement non-transmission solutions. While transmission providers are required to identify reliability needs and potential transmission solutions, FERC Order 1000 doesn't similarly obligate any entity to identify potential non-transmission solutions. Further, without a clear and comparable source of funding, no financial incentive exists to encourage third parties to propose non-transmission solutions." See http://mag.fortnightly.com/display_article.php?id=1365929&_width=.

- **A recent attempt to determine a "viable method to explore the contours of the utility of future" has resulted in a lengthy report and a new term, *Utility 2.0.*** The conclusion of this work, which solicited and analyzed ideas from scores of energy technology entrepreneurs, consultants, government agencies, and utility associations, addresses initiatives to continue to improve grid reliability and system performance throughout regulatory innovation and further pilot work.[6] Unfortunately, it is not clear what entity or entities are responsible for making this happen in a way that will ensure that both the utility and the customer benefit.

- **There is no incentive for a coordinated effort to recognize and maximize the distributed resource benefits in air quality attainment plans** (State Implementation Plans for achieving and maintaining National Ambient Air Quality Standards).

- **Utilities know how to mobilize capital for investment in plant and equipment. They do not know how to help mobilize capital for investment in customer facilities.** The development of distributed resources has not yet mobilized utility capital for investment in customer efficiency and customer-sited generation. Some energy efficiency programs have begun to use "on-bill-financing" as an effective payment mechanism for customer efficiency investment. But sources of adequate, affordable capital for customer investment are still paltry. They also are frequently given low priority. Utilities' own required rates of return are simply too high for most customer-sited investment.

How should utility charters be restructured?

- **Although there has been some experimentation with advanced metering infrastructure (AMI), to date most utilities have expended little effort in using this impressive technology.**[7] AMI can maximize customer benefits from energy efficiency, renewable energy, and demand response. In addition, AMI helps providers of such services design effective multi-fuel strategies that yield customer, system, and environmental benefits.[8]

- **There are massive levels of planned investment in generation, production, and transmission assets that might simply be unnecessary.** That is, all the structural challenges in the current system need not be solved only through more built (or even rebuilt) infrastructure. These challenges actually represent enormous

6 Energy Future Coalition, *Utility 2.0, Piloting the Future for Maryland's Electric Utilities and Their Customers.* Submitted to Maryland Governor Martin O"Malley, March 15, 2013. http://cleanenergytransmission.org/uploads/Utility%202-0%20Pilot%20Project-reduced.pdf.

7 We are using *AMI* to refer to hard-wired smart meters and related technologies that enable two-way communication about a building's electric energy consumption. AMI records and transmits information between the meter and the central energy system (distribution utility or transmission company, for example).

8 Several West Coast utilities have made this high-cost investment, anticipating using it for two-way communication and grid management. Examples are peak storage, using electric vehicle batteries and water tanks, real-time feedback, and monitoring on-site energy use and corresponding reductions in heating and air-conditioning temperatures during prolonged periods of extreme cold or hot weather. (There is some question about whether AMI is merely an interim technology—that is, it might be by-passed if customers prefer to use remote wireless controls.)

opportunities for saved energy and reduced utility capital cost—via innovation. They also can yield corresponding economic savings and environmental improvements. However, their chief value will be in reinforcing the foundation for a stronger energy system that effectively responds in aggregate to changing customer needs.

- **The risk to a utility of over-investing or misdirecting its investment actually increases as the potential expands for meeting energy needs through efficiency and distributed resources.**[9] The growing number of net-zero buildings, for example, and the expanding potential for them as cost-effective options for some customers, are essentially two indicators of the extent to which distributed resources might impact customer demand within the utility system. Consumer engagement with technology and investment in energy-saving and energy-generating equipment can significantly affect loads and load shapes. Because of this, traditional utilities now face a world in which capital-intensive infrastructure and business-as-usual approaches need a new framework for planning and for securing resources. That growing consumer appetite for investment in their facilities creates an opportunity for engagement. It can also alter investment in utility facilities. It means too that there is an opportunity for meeting energy needs with a constructive, meaningful approach that is itself potentially more comprehensive and sustainable than the current model.

- **The relatively new principles of least-cost resource planning and life-cycle cost comparisons in utility planning can apply to the transportation sector as well, but there is no available frame of reference to do so.** There are potentially significant system benefits to be attained by having the energy and the transportation sectors develop innovative partnerships. Both sectors involve high energy use. The emerging electrification in the transportation sector is very promising in the context of reducing the environmental and economic costs of fossil fuel use. But there is no superstructure that requires or enables utilities and transportation agencies to jointly plan strategies that could result in consumer-level reduced energy costs. Absent that structure, vehicle electrification might simply create new stresses on the electric system (and potentially through lost revenues, in the transportation system).

- **There is increasing evidence that human ingenuity has massive potential to provide benefits that the current utility system is not charged to help realize.** The ability to retrofit and construct buildings that use considerably less energy, including those that produce as much energy as they consume (net zero), is one such impressive feature of the next generation of energy services. Of immediate concern, utilities are ill-equipped to receive net-metered energy into their systems on a large scale. Other impressive options are being pioneered: lower water use,

9 Ron Binz. "Practicing Risk-Aware Electricity Regulation: What Every State Regulator Needs to Know." A CERES Report. April 2012. See http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation/view.

on-site energy management and monitoring, improved operations and maintenance practices, new strategies for energy storage or shifting, reclaimed materials, lower embedded energy costs, locally sourced material land use considerations, and recycling.[10] All of these approaches have sustainable energy features. Many of them can provide benefits to customers and society, and could be part of a customer's total energy strategy. For the most part, utilities have neither mandates nor an incentive to support the development of these strategies.

Energy utilities can't just build a plant or flip a switch to make this new approach happen. They need to think and act in new ways. We—the United States, the energy policy advocates, regulators, the energy sector, ratepayers—need a new policy and regulatory structure that will guide both utilities and us. We need to fix our sights on this "next generation" of service. At the heart of this change will be a shift away from the dominant model of the transmission and distribution system that delivers power from a central generating station and major extraction centers. **Instead, we will need to re-configure an interactive, networked system that balances and uses millions of customer-based and distributed resources**. This new structure will support a broad view of energy investment across capital infrastructure (at the utility scale *and* at the customer facility scale). It will also create innovations in energy delivery, technologies, efficiency, energy management, and new systems approaches to meeting energy needs.

10 Embedded energy costs are the upstream energy costs in the manufacture and production of goods. Engaging upstream partners, all the way to raw materials extraction operations, to obtain energy efficiency can create significant downstream energy savings.

Emergence of the Sustainable Energy Utility

What are the essential characteristics of a new utility business model?

In the late 1990s, "restructuring" and "re-regulating" utilities were espoused as ways to bring innovation and new forms of energy service to market. To the extent that this effort opened markets to competitive generation, it provided real benefits. But particularly with regard to energy efficiency, there was a substantial vein of "magical thinking" running through this discussion. Several jurisdictions decided that the "market" ostensibly created by restructuring would promote new service offerings that involved energy efficiency and other services. Vermont, Oregon, and other jurisdictions advanced the alternative concept of obtaining deep, independently delivered, and sustained investment in efficiency services via a regulatory shift, classifying these services as a *public good.* These jurisdictions recognized that customers need and deserve systematic infrastructure support to overcome the barriers to efficiency, particularly because those barriers are deeply embedded in the current economic structure. This recognition of a new form of an existing concept actually helped support customers and helped develop markets that could provide energy efficiency services. Further, the investment in efficiency continued to be recognized as a way of meeting energy needs at a lower cost. In addition, it emerged as a resource option on a par with utility investment in generation, transmission, and distribution.[i,11]

VEIC holds the nation's first franchise to operate as an Energy Efficiency Utility (EEU).[12] The utility has operated as Efficiency Vermont for thirteen years, delivering energy efficiency services statewide to customers, independent of what were originally 22 electric utilities in Vermont (total population 626,000). Efficiency Vermont operated under a contract with the Vermont Public Service Board from 2000 to 2010,[ii] when the Board issued an Order of Appointment[iii] for VEIC to deliver Efficiency Vermont services as a franchised entity. As the work of Efficiency Vermont has matured, a picture of a possible new and complementary partnership between the traditional energy utilities and the EEU (or **Sustainable Energy Utility [SEU]**, as we are calling the general form of this type of entity) has begun to emerge.[13] Efficiency Vermont is partnering closely with Green Mountain Power, the Vermont Electric Co-operative, and other Vermont distribution utilities in the roll-out of a major AMI transition that will provide AMI service to over 90% of Vermont customers, and will provide customer data to the SEU in intervals of between 15 minutes and an hour.[iv]

11 Additional references have been used throughout this paper that will be of value to readers who want to explore relevant topics further. These references are presented at the end of this paper and are flagged as endnotes with roman numerals throughout the paper.

12 *Energy Efficiency Utility* is the term used in Vermont law for thermal and electric energy efficiency services, which can also include biomass and other renewable energy services. For this discussion, we will use the more generic term *SEU* to refer to services in Vermont, and include in the term the sustainable energy utility approaches under way in jurisdictions such as Oregon, Nova Scotia, Hawaii, and the District of Columbia. Wisconsin, New Jersey, Maine, and Delaware also have systems in which some efficiency and renewable energy services are provided for multiple utilities by a separate entity. See also the next footnote.

13 The term *Sustainable Energy Utility* refers to an entity that delivers electric and thermal efficiency services; and which might provide or support delivery of renewable energy services. The term *Energy Efficiency Utility* typically is used for an entity that primarily provides electric and thermal efficiency services, with renewable energy solutions marketed and delivered under a separate structure. The services overlap substantially. For the purposes of this discussion, we use the term *Sustainable Energy Utility* or *SEU*.

This new partnership is re-defining the role of utilities. The "next-generation energy service"—provided by innovative municipal utilities and SEUs like those VEIC operates, and in some cases by leading investor-owned utilities—creates a new dynamic in the energy marketplace. It can systematically mobilize and help direct the high potential value of distributed resources to the customer side of the meter. This is the combination of energy *and* support services that helps customers make energy investments and choices that lower their costs; improve their lives; and strengthen their communities, the environment, and the economy. This new form of service is of critical importance to creating a resilient energy future in the United States. It reflects the fact that *infrastructure* no longer refers simply to reliable supply. *Infrastructure* now includes trusted information and support for customers and markets on the broad range of energy options available to them.

The dramatically increasing availability of energy efficiency (and distributed resources generally) is an emerging, powerful force for meeting energy needs. In some jurisdictions, efficiency is being acquired by maturing, regulated utilities and regulated SEUs that offer electric and gas efficiency and renewable energy. The emergence of these alternative resources and of the new structures that help acquire them challenges the economic structure of the traditional supply utility. This challenge is to move from a simple "more is better" model toward an integrated-delivery model.[14]

This new model will need to contain two critical interdependent elements: (1) an **Energy Infrastructure Utility (EIU) function**, which is an evolution of the current regulated utility structure, operating in tandem with (2) a **Sustainable Energy Utility (SEU) function**, which systematically marshals the ability of distributed resources to address energy needs. Current industry topics such as the "Utility of the Future" and "Utility 2.0" are attracting attention, but the need for the SEU function is generally not part of the discussion. The two-component approach we are advocating holds promise for enhancing what distribution utilities have traditionally done best: deliver energy to buildings, and do it reliably. It can also help reduce confusion in the marketplace for customers, who have always wanted and will always want affordable energy on demand, but now increasingly want reliable information and support as well. These two "wants" help them make fuel choices, invest in energy improvements to their buildings, and change their energy use behaviors. In a world of diversifying technology options, marketplace confusion holds back effective progress.

The ability of an SEU to mobilize customers and markets will draw on technological innovation, and on customer desire for more choice and trusted guidance in determining their respective energy futures. **But it fundamentally requires sustained investment and support to overcome ongoing market barriers.** This requirement runs contrary to the hoped-for magic that regulators anticipated in the era of "deregulation." VEIC's concern is that in considering the shape of the "utility of the future," there is an element of this magical

14 This set of issues is the topic of a significant new set of studies described as "America's Power Plan" funded by The Energy Foundation: http://americaspowerplan.com/the-plan/.

thinking again pervading the policy discussion. In fact, the option for "deep" mobilization of distributed-resource development is an area of expertise and ongoing learning that represents a maturation of utility energy efficiency programs. It is both very different from traditional utility expertise and essential to informing the evolution of utility service.[15]

Just how will that partnership work? How is the notion of a public good to be defined in this changing era? How can traditional utilities evolve, and distributed resource development strategies mature, in ways that qualify them to develop partnerships for delivering next-generation energy service?

Although we do not have a complete picture of how the new EIU structure would evolve, we believe it must focus on creating and maintaining a highly reliable, intelligent, and interactive distribution system. It will also play a leading role in planning for transmission and supply, just as it will play a role in long-term planning, in partnership with market generators, ISOs, and an interdependent SEU. But can an EIU and an SEU be structurally part of the same entity? This is not yet known. We begin discussions of this important issue on page 22.

15 In many parts of the country, utilities are facing major workforce transitions, with up to 50% of their employee bases retiring in the next decade. New, younger populations are moving into the utility sector, and they are expected to hold different values that can assist utilities in making this transition to the next generation of energy services.

The Forces Changing Traditional Utilities

It is important to examine in more detail the dynamic forces that are pressuring the regulated energy utility industry to change:

Utilities now face a world in which external and diverse partnerships might be the key to meeting the basic but evolving customer need for energy.

1. Mature energy efficiency programs and other distributed-resource strategies on a utility scale are now a critical component of affordably and cost-effectively meeting customer energy needs. In 2012, 12.3% of Vermont's electric load was being provided by efficiency. This significant share—in a statewide energy portfolio that in 2006 projected annual underlying load growth of approximately 1.4%—is the product of more than a decade of efficiency investment. In fact, electric load growth has been relatively stable throughout that period, and declining since 2007.[16] The introduction of energy efficiency as an alternative strategy for meeting customer needs was a fundamental policy shift in two important ways:

    - It meets customers' energy needs not through utility investments in external capacity on behalf of customers, but instead through ratepayer funds to promote investment in customer facilities not owned by the utility. This shift has provided benefits to customers, the utility system, and to society generally. In addition, its environmental benefits have been measured in terms of greenhouse gas emissions avoided and water and fossil fuel saved—and has resulted in cleaner air and water.

    - To demonstrate the benefits of energy efficiency, the discipline of a systematic life-cycle cost comparison of energy options—including an expanded range of related costs and benefits—was introduced to (if not fully implemented in) utility decision making.

2. The presence of independent energy producers—providing energy from traditional generation and from wind, solar, and other generating sources—has changed the vertical integration of monopoly energy companies. Those independent energy providers have gained access to the once-exclusive electric and gas transmission and distribution facilities. In some jurisdictions a restructuring of utilities has meant divestment of generation and transmission assets, and has enabled customers to choose the sources of their energy supply. At the same time, in other jurisdictions, new utility corporate structures (holding companies) have meant that these changes have had a less dramatic impact than might have been hoped for.

16 See, for example, Parker, Scudder, Michael Wickenden, and Blair Hamilton. "What Does It Take to Turn Load Growth Negative? A View from the Leading Edge." *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings,* 2008. http://www.veic.org/resourcelibrary/VEIC_Resources_on_Program_Design.aspx.

3. Growing recognition and increasingly documented impact of environmental effects from energy production have challenged utilities' long-held practices of "externalizing" many of the costs of energy production, generation, and use.

4. Growing "interactivity" and the potential for substituting different forms of energy and their end uses create both opportunities and challenges that the monopoly operating in a regulatory system cannot easily address.

What These Forces Mean for the Utility Industry

Most of the nation's investment in energy efficiency is still taking place within the context of traditional energy monopoly regulation and oversight. As discussed earlier, this system was designed primarily to mobilize and reward very large investments in centralized generation, transmission, and distribution infrastructure. It has succeeded in building a reliable electric and gas delivery system that operates at a relatively low price. This system has also been a driver of economic development.

What energy services do customers need now and 20 years from now, and how should those services be delivered?

The notion of *demand-side management*—a regulatory term to describe energy efficiency, demand response, and other customer-focused strategies—emerged as a way of requiring these regulated-monopoly utilities to begin balancing increasing costs and risks in their portfolios by including efficiency resources that cost demonstrably less than current supply options. This framework has facilitated the growth of investment in efficiency. It has provided an appropriate starting place and a relatively secure source of funding to incubate and influence the development of programs. There have been important changes in the behavior of customers, markets, sustainable energy trade allies, and energy-efficient product manufacturers toward more efficient end uses and practices. This investment in efficiency has facilitated and sometimes directly supported improved efficiency through changes in codes and standards at the state and federal levels.

We would emphasize that the regulation of energy efficiency investment strategies itself has evolved in the context of monopoly regulated utility oversight. There are increasingly clear indications that the regulation of monopoly utilities and distributed resource development are very different activities.

Regulators have begun to adjust their thinking and practices. They recognize the tensions between energy efficiency and the utilities' traditional mission of supplying power to customers. Regulators have also benefited from lessons learned as energy efficiency programs have developed. Designing performance incentives for energy efficiency programs and decoupling sales from efficiency efforts are just two relatively new features of utility regulation in many jurisdictions. In addition, some regulators have taken into consideration ratepayer "system benefits" that come from energy efficiency and distributed resource strategies. These are quantifiable variables in cost-effectiveness screening, load forecasting, and utility planning. Although the environmental, economic, and societal benefits of energy efficiency are frequently described, they are less often quantified in cost-effectiveness calculations.

Table 1 offers the comparison between what utilities have done in the past, and what a new utility structure offers to the customer.

Table 1. The contrast between the traditional role of monopoly utilities and the role of emerging sustainable energy utilities

Utility Provides	Old Definition: "Serve the Customer"	New SEU Definition: "Empower the Customer"
Service	**Reliable electric service** • kWh and capacity • Billing/customer support • Transmission/distribution maintenance	**Trusted support for the customer** • Deep technical knowledge • Independent technical assistance • Incentives • Metering / verification
Infrastructure	**Capital assets** • Generation/related services • Transmission • Distribution	**Build and support the market to create customer opportunities** • Trade ally training • Develop market channels • Tracking / assessment • Regulatory understanding and support
Definition of *Public Good*	**Natural monopoly** provides service at "just and reasonable" rates	Identifying and overcoming market barriers to adopting energy efficiency and other distributed resource options, both to acquire immediate, cost-effective energy resources and to transform markets over time.

Efficiency Moves in Complementary and New Directions

Effective energy efficiency implementation operates best through a market engagement strategy that is designed to empower customers and market actors to provide new technologies and services that the ordinary operation of markets has not promoted. The capacity to secure energy efficiency has in some instances moved toward maturity within the utility setting. Some utilities have incorporated energy efficiency into their portfolios for (in some cases) more than 30 years, evolving the effectiveness of their programs over this time. However, the SEUs' insight into the potential for serving customers suggests the possibility of a whole new dimension of relationship between customers and efficiency providers. The emerging relationship will be essential to providing next-generation energy service. Effective SEU implementation will have the following attributes:

1. **Understanding the customer and building a relationship of trust: These come first.** Continually seeking new understanding of customer interests and needs, and thereby learning where the opportunities for efficiency can add value, are critical. This identifies where customers' barriers to adopting efficiency lie. It also suggests the path for overcoming those barriers with responsiveness and resourcefulness.

2. **The full range of customer challenges is understood.** Disaggregation and deep understanding of market sectors must characterize the efficiency effort. The objective is to offer responsive service to all customers, no matter what their unique barriers are to entering the efficiency market.

3. **Solutions are tied to markets and help shape markets.** A clear commitment to market-based solutions involving manufacturers, distributors, vendors, designers, installers, and builders is of critical importance. The SEU helps train and expand—and even develop—the markets in which it works, across the entire supply chain.

4. **High quality and high value are the deliverables.** A culture that is committed and open to technology innovation, combined with creativity in devising new service strategies to serve customers, has become the norm in well-run efficiency efforts.

5. **Deep levels of expertise and a vendor-neutral approach build customer trust and satisfaction.** A commitment to being the customer's "trusted and independent energy advisor" that provides customer benefit, rather than having an interest in supporting particular energy forms or products, is essential to success. This means being vendor- and fuel-neutral, and being objective in providing information in ways utilities might find difficult.

6. **The SEU is a one-stop shop for customers' energy needs.** Comprehensive efficiency services, including all-fuels services, non-energy benefits, water savings, waste reduction, fuel choice, and renewable energy guidance, will be increasingly expected by customers. Customers have already requested support for transportation efficiency. It is becoming an increasingly logical component of service.

7. **The efficiency effort never loses track of comprehensive engagement.** Commitment to broader strategies that support efficiency, such as technology assessment, market development, community and market sector partnerships, codes and standards work, and legislative action, must be part of a comprehensive efficiency effort. This is really about investment in relationships and ongoing service.

However, the SEUs' insight into the potential for serving customers suggests the possibility of a whole new dimension of relationship between customers and efficiency providers.

8. **Finding new ways to partner is critical to the ongoing relationship.** Innovation and invention are keys to the process. How can the data from AMI, for example, and from more detailed metering be put to use in increasing efficiency? How can those data create new options for more comfort, productivity, and affordability? How can the new, intelligent energy delivery system help customers benefit from the cost and availability of energy in its various forms? Are there ways to use information about natural gas and electricity use to save on both forms of energy? Are there ways to benefit from improving the timeliness of customer use of these forms of energy? What role can new industries play in creating products that will support consumers in using this information?

9. **The SEU rigorously documents savings and benefits, and conducts continuous quality control.** This means that the efficiency effort is accountable for its performance and effects. It also means that the efficiency effort continuously advocates for recognition in its cost-effectiveness tests of savings and benefits beyond strictly defined energy savings. Independent third-party evaluations and quality control are also essential to ongoing effectiveness and credibility. As real-time information about energy use becomes more available, it might be that the methods for measurement and verification change—and become better documented and more accurate.

10. **The SEU consistently supports and helps develop strategies that will help customers find affordable financing for their investments.**

What Is Different about Efficiency?

Customers have always known that they need energy supply. It might not be as clear that they "need" energy efficiency. Promoting efficiency is a service requiring very different skills from those offered by traditional energy utilities. For starters, efficiency customers belong to markets, not to service territories—and they need market-based support. There are six other critical differences:

1. **Effective efficiency programs build relationships; they don't sell commodities (even though they promote new technologies).** Capitalizing on this difference is the way to promote efficiency. Customers are investing in improvements to their energy use, and will view the opportunities and benefits from their own perspectives.

2. **Efficiency strategies can rapidly move beyond the energy source (or sources) that an EIU is providing to meet customer needs.** Customers invariably want services that deal with all their energy and building issues. Arbitrary limits to assistance can destroy trust, rather than build it. Fuel choices (self-generation, heat pump technologies, and biomass thermal uses) that switch away from the EIU energy type should be as much on the customer's table as the EIU's energy type.

3. **Efficiency benefits might be well beyond those readily recognized by a utility regulatory structure.** The traditional utility regulatory structure is not generally set up to recognize market transformation benefits and non-energy benefits, even though these could be immensely positive for customers.[17] They could also significantly benefit communities and the environment. Increasingly, other sustainability drivers, practices, and opportunities should be recognized in the delivery of SEU services.

What have we learned about what makes wholly new, customer-engaged services successful?

4. **Efficiency services have become effective by recognizing opportunities for relationships that are generally beyond the scope of traditional utilities.** It is increasingly clear that EEU strategies need to build partnerships with affordable housing entities, industrial trade associations, retailers, wholesalers, builder associations, the professional design community, and other institutional and corporate structures. They also need to build partnerships with financing entities to expand their effects and leverage new capital.

5. **The larger system benefits that efficiency and distributed-resource strategies provide have been largely ignored in the planning processes of utilities and ISOs. In some cases, they are systematically disadvantaged in planning and investment strategies.** Utilities have not been leaders in advocating for recognition

17 The codes and standards dilemma is a case in point. When energy efficiency programs help promote a new, more efficient building code or product standard, their "claimable savings" are generally diminished as regulators treat the new standard as a "new baseline." In effect, this penalizes energy efficiency efforts for this kind of market transformation effort.

of these benefits. In many cases, regulators and other policy leaders have been slow to recognize these benefits, as well.

6. **Efficiency services are knowledge based and relationship based. They must be dynamic and flexible.** As part of their portfolios, they need to invest in initiatives that will not have immediate return and they need to be able to phase out technologies or market sectors that become mature.

Energy efficiency and distributed-resource development are evolving rapidly. That maturity reveals a strong potential for providing deep cost savings to customers and for altering patterns of energy use. A consistent theme in this work has emerged with a question:

How do aggressive efficiency investment strategies and possible changes in distributed resources alter the traditional economic model for investor-owned (and potentially also for customer-owned) utilities?

The question has been posed in several different ways:

1. Conventional wisdom suggests that the design of performance incentives and the decoupling of utility sales revenues from efficiency savings should be sufficient to fully engage the commitment of utilities to energy efficiency and distributed resource investment. *Despite recent efforts to mitigate utility practices that actively disincentivize efficiency initiatives, is the current utility structure really the right setting in which to support aggressive deployment of distributed resources? It might be that decoupling simply neutralizes utilities' attitudes toward energy efficiency and distributed generation, while not making the utilities advocates.*

2. As efficiency strategies move more deeply into markets, energy efficiency programming needs to provide "navigational help" to get customers to the most cost-effective, appropriate energy solutions for their needs. This assistance can be complex and ranges well beyond reducing the use of a certain fuel type. It is a given that the classic structure of a regulated utility can invest in large amounts of capital equipment to deliver a relatively simple product to consumers. *But are utilities the appropriate entities for supporting the business skills required to overcome customers' barriers to adopting energy efficiency and distributed resources more generally?*

3. Well-planned, regulated energy efficiency programs have begun to transform portions of energy markets. Although the benefits of efficiency are demonstrable, they are not all valued in a regulated utility environment. *Given the environment of monopoly energy regulation, are the regulatory tools and incentive structures that oversee investment in energy efficiency the best instruments for guiding and rewarding distributed resource investment?*

4. What would happen if a serious carbon tax were introduced or some version of a Total Energy Standard (TES)? Current carbon tax proposals almost universally fail to recognize the value of sustained customer services like those being created in the energy efficiency sector by both utilities and SEUs. The potential for the SEU to interact with customers using non-regulated fossil fuels would be a critical component of the imposition of a carbon tax. Would it be appropriate for regulated energy utilities to control the efficiency and distributed resource development for customers in the context of a carbon tax?

It is appropriate to ask whether an existing regulated utility that is doing a competent job of implementing energy efficiency services to customers could provide both the EIU and the SEU functions. The answer to this question is unclear. The SEU function has several attributes that make it challenging for the traditional regulated utility to play this role in the broad definition we are suggesting for it. These are:

- **It should not be about sales**. The SEU must be first and foremost the customer's trusted source for independent energy information. It should have expertise and be able to give impartial advice, including options for fuel choice and technology. This will require a deep level of knowledge about available choices, and a thorough understanding of the potential costs, benefits, and risks of each. It could be a difficult challenge for an incumbent utility to operate in this manner.

- **The SEU function should be free to explore innovative sources of public benefit.** It should be able to provide gas, electric, transportation, and unregulated fuel services. It should be able to help realize (both at the customer and the system levels) synergies among different energy forms. These would essentially be fuel switching, storage, time of use, renewable energy, and of course, efficiency.

- **The SEU function should not be a way for the incumbent utility to gain market advantage in other energy sectors, beyond the base service it provides.** This is a serious issue as the current question is debated: Who should administer pilot programs using AMI? If the choice is between an incumbent utility and "the market," as a set of competitive (often unproven) independent actors, it is likely that the utility will be selected. This poses real risks. A truly independent SEU might be able to provide this brokering function in a way that maximizes customer benefit, provides real utility benefit over the long term, and helps grow a high-quality network of skilled market participants.

- **It is not clear how an SEU function could be a truly independent function of an incumbent utility.** If there is a way to do this through a corporate subsidiary arrangement, and that entity is separately regulated, that might be a workable approach.

- **There might be actual value to the EIU to have the SEU be independent.** If the EIU is focused on supporting a new distribution utility approach to providing energy services, it might benefit (through increased trust from consumers and through independent pressure from the SEU) by evolving to provide services in a new way to customers.

Re-defining *Public Good*

The exploration that began as utility demand-side management is maturing. It needs a distinct structure, and an independent voice in the major decisions about how we meet our energy needs. Fundamentally, the notion of investing ratepayer funds to address both unique and systemic barriers to more efficient use of energy signals a new definition of *public good*.

How do we assure that the essential utility functions and customer-focused services each realize their full potential?

This has been a recurring theme in this paper. We have spoken about a new and expanded definition of energy *service*, and a new definition of the *infrastructure* needed to support customers in a full range of energy service options. VEIC is persuaded that the traditional notion of *public good* also requires re-definition to encompass an entity that is a trusted independent resource helping customers make the energy choices, investments, and uses that will simultaneously increase their own benefit, the benefits to the energy system, and ultimately the benefits to society that sometimes seem the hardest to attain.

This new definition—and with it, a new understanding of the term—can help energy utilities operate more beneficially for their customers. But that new definition might not flourish under the control of utilities as currently structured. The maturation of energy efficiency programs—going well beyond light bulb replacement and the installation of energy-efficient equipment in businesses—requires capabilities that are not within the natural skill set or the traditional approach of regulated utilities. The technical expertise in efficiency has grown in some of the SEU efforts to an impressive level that is valued by customers. But it is not a logical investment or priority for traditional utilities, or possibly, for EIUs.

If the bottom line is next-generation energy service, public good has just taken on a new, additional meaning... utilities will need to evolve. The definition of *public good* can go even further.

A well-regulated SEU engages whole communities, provides direct benefits to customers, and supports investment in their buildings (whether homes, businesses, or institutions) in a way that also provides system and societal benefits. Many regulated utilities are good at customer and community engagement, even though they are not inherently structured to do that. As new technologies such as AMI are introduced into customer buildings, frequently the first call for customer support is to the utility. It cannot be assumed that the potential of distributed-resource strategies will be fully realized in the current monopoly utility planning and investment process. It might well be that for next-generation energy service to mature, the definition of *public good* has to expand to include the range of services offered by the SEU. In reality, there is a broad spectrum—from utilities that do nothing in the energy efficiency space to those that are comparable to what current SEUs provide. It is also true that current efficiency providers (including current SEUs) often lack sufficient knowledge of utility infrastructure and management. This requires that, as roles evolve, they not be defined as in conflict, but in a constructive (and hopefully productive) tension.

At the same time, the dynamics forcing change in the regulated energy utility model are real and powerful. Energy Infrastructure Utilities will need to evolve. They must build new capabilities to serve their customers effectively in the future. That is, the definition of *public good* for these entities can also expand.

The Energy Infrastructure Utility Joins the Sustainable Energy Utility

The articulation of two distinct roles, the EIU and the SEU, and defining their interaction and relationship, are critical to maximizing future benefits to customers, systems, the environment, and economic development. In conceptualizing this new structure, VEIC believes the EIU should continue as the regulated, still generally capital-intensive entity whose purpose is to provide on-demand energy service. Increasingly it should move to performance-based regulation. It can be a for-profit corporation, a municipal utility, or a co-op. But its focus should be on efficient and effective development and maintenance of the electric and gas infrastructure and related functions. Through its dynamic partnerships with key technology vendors and service providers, it will own and operate the new, smarter distribution systems. These, in turn, will change in nature and become more diversified. This diversification will make them more resilient in the face of shifts in prices, fuel supply, and the marketplace. The new EIU might provide a part of the energy production mix, but it will coordinate with independent generation companies, distributed generators, and co-generation (combined heat and power, or CHP) projects, in partnership with a comprehensive SEU. The SEU will offer support for the full range of market-based, customer-first distributed resources: small-scale renewable generation, co-generation, energy storage, and energy efficiency. The EIU will build a system that can integrate their production. It will also guide their investment to provide greater system benefits.

An important paper, "DR 2.0, A Future of Customer Response" by Paul De Martini of Newport Consulting (July 2013), suggests that there might well be a whole new realm of ancillary services that customers can help provide to the utility system. The SEU, although not necessarily the logical provider of those services, would be an essential partner in helping customers identify, structure, assess the benefits of, and participate in providing such services.

The role of the SEU is to empower consumers in a way that fills the critical service gaps inherent in the EIU. That is, the SEU should be devoted to fulfilling the customer-engaged potential for next-generation energy service. That service concurrently maximizes benefits to customers, just as it benefits energy systems and society. In maximizing benefits for customers and society, an SEU can be a nonprofit, a limited-profit, or a public benefit entity. A municipal utility, a co-op, or a public utility district could be both an EIU and an SEU, but even in such entities, the SEU role needs to be clearly articulated and strongly supported with dedicated funds and independent authority.

This approach establishes the SEU as a *public-good entity* that is neither a governmental entity nor a traditional nonprofit entity. It is unlikely that a profit-maximizing entity can effectively play this role. Its function is to identify and help overcome market barriers. It is regulated, but its program design is grounded in market-based strategies. Its compensation structure should contain incentives for achieving high levels of performance. That performance should include metrics for customer benefit, system benefit, environmental benefit, and

economic benefit. It should also be funded in large part through a system benefits charge to utility ratepayers—and ideally to customers of other fuel sources. In time, it can secure funding through the other benefit streams it delivers (greenhouse gas reduction, Forward Capacity Market sales of saved energy, and new benefit streams from avoided peak capacity investments in natural gas and electricity transmission). It is functionally independent from the regulated electric and gas EIUs, and provides independent expertise to the customer. It has full access to customer energy use information with strict confidentiality protections. Even though it is independent, it has a strong working partnership with the EIU. This separation of what are typically internal corporate functions creates a new dynamic. This dynamic could direct the whole energy delivery infrastructure to attaining customer, system, environmental, and economic benefits—with a reduced (but still critical) need for traditional regulatory processes.

Both entities are essential for managing the new energy system effectively, and serving customers successfully. Four features of these interdependent functions are worth noting:

1. **Names**. A new name for the body of traditional (and evolving) utility structures nationwide, the EIUs; and a name for the customer-engaged sustainable energy utility, the SEU.

2. **Roles.** A new definition of roles for the EIUs and for the SEUs.

3. **Effectiveness.** Thoughtful recognition of where services might be in some tension with one another, and acceptance of the need for ongoing dialogue to balance system needs and customer inputs.

4. **Coordination.** Thoughtful recognition of where each will need to be an active partner of the other.

These features are at the heart of future thinking and action about these two distinct and interrelated functions. **Table 2** compares the two types of new utility, by function.

Table 2 Traditional investment utility and sustainable energy utility: differences in mission and cost structure

Function	Traditional Regulated Utility	Sustainable Energy Utility
Organizational Logic	Natural monopoly • Prohibitive cost to duplicate infrastructure	Model for securing unrealized customer, system, and societal benefits
Goal	• Overcome barriers and risks of large capital investment; • Realize benefits of scale	• Overcome barriers to adopting cost-effective energy savings; • Gain related system and societal benefits • Intelligence is the fundamental product
Mandate	Make large capital investments in plant and equipment to guarantee reliable service	Create institutional capacity to: • Help customers invest in their facilities to reduce their long-term costs; • Provide system and societal benefits • Sustain responsiveness so that barriers can be overcome
Cost Structure	• Large investments, limited risk (traditionally); • Solid, regulated returns	• Structure requires sustained, performance-related funding • Limited equity—mostly personnel; contracts; and incentives
Regulatory Focus	Protect consumers, reduce ratepayer risk, and keep earnings "just and reasonable"	• Guided by principle of least-cost procurement of distributed resources • Ensure that benefits are real and delivered cost-effectively

Function	Traditional Regulated Utility	Sustainable Energy Utility
Institutional Flexibility	Limited flexibility • Chartered to make long-term investments and maintain long periods of reliable service	• Uses knowledge, innovation, and systems approaches to drive flexible responses to changing markets and conditions • Needs stability of funding to provide service effectively, but not tied to large capital assets and able to shift to new opportunities and forms of service
Risks	• Market changes • Technology failure • Regulatory treatment	• Lack of clear mandate in many jurisdictions; • Instability in funding mechanisms (SBCs, state government raids, etc.); • Discretionary program mentality, rather than investment approach; • Conflict with traditional utility interests; • Archaic regulatory treatment
Effect of Reduced Sales	Potential economic penalty if consumption is reduced	• Maximizing energy benefits is the goal; • Reward for reducing energy consumption
Corporate Orientation	• Regulators • Shareholders • Customers	Customers and markets
Scope of Services	Regulated energy service and sales	• Potentially all fuels and end uses • All distributed resource opportunities

Core Functions of the EIU

The EIU should be managed increasingly through performance-based mechanisms. Jurisdictions should set clear policy goals regarding reliability, resiliency, affordability, and environmental and economic goals. It should provide significant opportunity for innovation and flexibility and clear processes for documenting attainment. Its areas of responsibility should include:

1. Managing distribution and transmission system capacity and reliability.
2. Increasing the system utilization factor (the maximum demand on the system, divided by its rated capacity).
3. Giving high priority to a new, smart distribution system that improves reliability through flexibility, information management, and diversification of supply.
4. Procuring electric supply through investment in generation and power supply contracts.
5. Procuring gas supply through investment in storage and extraction.
6. Promoting, coordinating, and integrating small-scale and customer-sited distributed generation in partnership with the SEU.
7. Partnering with the SEU to coordinate and advocate with transmission providers and the regional transmission organization both to recognize SEU load impacts, and to plan for better use of SEU capabilities to reduce system costs.
8. Installing, managing, and operating metering (and advanced metering) infrastructure and system management technologies.
9. Providing the SEU with full access to customer data, to inform analyses for effective efficiency / renewable / time-of-use strategies.
10. Designing cost allocation structures and time-of-use pricing systems.
11. Managing customer billing and payment systems.
12. Providing customer interfaces to address system reliability and billing information.
13. Partnering with SEU and financing sources to help customers gain access to low-cost capital for energy improvements to their buildings.
14. Using billing systems (where appropriate) to facilitate payment for short-payback energy efficiency and distributed generation investments (on-bill financing, for example).
15. Coordinating service to the greatest extent possible with other regulated energy utilities.

16. Sharing the commitment with the SEU to serve ratepayers.

17. Support and planning (both near-term and long-term) for changing load demands as a result of electrification of transportation, transportation using compressed natural gas, and non-utility thermal uses.

Core Functions of the SEU

How do we assure that the essential utility functions and the resources provided by customer investment are coordinated to provide lasting benefits?

The SEU should also be given a clear set of policy goals (many of which might repeat the goals set for the EIU). Goals might also specify in broad terms a requirement to identify ongoing opportunities for providing customer benefits, improved system performance, and broader societal benefits.

1. Providing the customer and market-facing components of next-generation energy service to customers, ensuring improved energy service and lower bills through:
    - Comprehensive efficiency services for all fuels (electricity, natural gas, fossil fuels, biomass, etc.).
    - Impartial and trusted assistance regarding customer fuel choice and renewable energy options.
    - Support for an EIU's demand response and load management in the context of local distribution and regional transmission organization's (RTO / ISO) grid reliability.
    - Identifying and helping customers realize benefits related to energy improvements in energy use: comfort, product quality, waste reduction, water efficiency, and integrated facility design.
    - Incorporating into SEU service offerings strategic electrification strategies relating to electric transportation demand, heat-pump technologies, and possibly supply.
    - Providing information about available incentives, capital, and other financing for energy improvement projects to buildings.
    - Providing leadership and support to develop innovative strategies to finance customer distributed resource investments.
2. Developing and maintaining a strong core technical knowledge base across the spectrum of energy use and distributed-resource options, including efficiency, renewable energy, CHP, energy storage, transportation, and timing of energy use.
3. Providing measurable "system benefits" to the EIU by understanding challenges facing the EIU, the RTO / ISO, and the opportunities for more benefits from SEU service.
4. Providing measurable societal benefits by delivering non-energy, environmental, and economic benefits.
5. Consistently developing market capacity to provide high-quality services.

6. Continuously identifying opportunities to remove market barriers and provide next-generation services.

7. Disaggregating markets to reach all customers, regardless of differences in demographics, geography, fuel type and use, or building structures.

8. Partnering with and facilitating community initiatives that support next-generation services.

9. Advocating for codes, standards, tax, and regulatory policies that will provide benefits to customers, systems, the environment, and local economic development.

10. Establishing quality assurance norms and providing continuous quality control to document savings and benefits, and to improve effectiveness of service.

11. Partnering with technology companies to bring cost-effective products and benefits to ratepayers.

12. Engaging customer relationships that are likely to provide durable next-generation services.

Joint Functions of the EIU and SEU

- Joint annual planning, and joint demand forecasting for both the near term and the long term.
- Distributed generation planning.
- Integration with total supply planning and capacity-related planning at utility and regional transmission organization levels, to identify and document:
    - Efficiency levels that affect total load and load shape.
    - Levels of demand response that shift load shapes.
    - Integrated energy efficiency, renewable energy, and strategic energy uses to affect load and load shapes.
    - Ancillary services.
    - Bi-directional load control.
- Integration of programming between the SEU and both gas and electric EIUs.
- Integration of emerging transportation energy efficiency with least-cost procurement strategies.
- Integration with system reliability planning.
- Shared information about customer energy use and customer support.
- Coordination that enables financing options for investments in customer-based next-generation energy services.
- Coordinated customer support and service.

The New Framework

The strength of a new utility framework that combines energy supply infrastructure with the market-based, customer-centric approach of sustainable energy utilities has significant promise for durability in today's changing energy landscape. This partnership between the EIU and the SEU can embrace changes in technology, provide an easily navigable energy and financing marketplace, give customers cost-effective energy on demand, and sustainably deliver system and societal benefits.

Next-generation energy service will require legislative, regulatory, and industry action—just as the nation's first energy utilities did in the 1800s and early 1900s. To be sure, a business model based on increasing efficiency and distributed-resource investment will be a paradigm shift. But it will also deliver the benefits the next generation has been waiting for.

How Will this Discussion Take Place?

VEIC's daily experience of learning from its customers, understanding markets, and recognizing the potential of new technologies, makes us tremendously enthusiastic about ways to address climate change, energy security, affordability (for all customers), and sustained economic well-being.

We believe this is the larger context in which the discussion about how utilities can evolve should take place. This is also why we highlight the importance of treating distributed-resource development through an SEU as a strategy that requires full and focused attention in the discussion.

This paper has outlined the challenges and opportunities in the current energy markets, specifically with regard to the evolution of regulated energy utilities and the customer-facing energy programs they offer. The paper proposes what would be very dramatic changes to the current system, and VEIC does not have a defined strategic plan to investigate just what all of those changes will be, nor how they might be accomplished. VEIC believes that the approach to several of the structural issues outlined in America's Power Plan, a national project designed to tackle the tough questions and provide a vehicle for policymakers at the state and local levels to address these challenges, provides a constructive and useful opportunity to advance the discussion.

Since the scale of the discussion is very large, and many parties need to be involved, our initial thought is that state public utility commissions might open an "investigative docket" to create a non-contested process to secure input from, and promote dialogue among, key parties. It might well be that a legislative mandate to open a public investigation, conduct it, and report back to the Legislature would be an appropriate place to start. This model was used with some success in the investigations into "utility restructuring" in the late 1990s. In this instance, it is vitally important to have formal participation from the transportation sector and the regulated energy sector in such a proceeding.

States also engage in many "state energy planning" processes that might be forums for considering the approach outlined in this paper. It might also be that states bold enough to address how such an approach could move to a new energy economy could have a broader discussion that involved a wider array of climate change strategy options, such as a carbon tax. A discussion about a broad policy change like a carbon tax actually would complement the utility changes addressed in this paper. In that event, a "carbon czar" authorized to help shape and direct the discussion might be a key structure to use. This administrative position would be authorized (among other processes) to invite a Utilities Commission to open a proceeding that also involved transportation, environmental regulators, public health leaders, consumer advocates, low-income advocates, and business and trade associations.

Additional Resources

[i] Regulatory background on the development of the Energy Efficiency Utility in Vermont: Docket 5980:
http://psb.vermont.gov/sites/psb/files/projects/EEU/eeurfp2005/5980eeu.pdf
[ii] Efficiency Vermont Contract 2000-2002
http://psb.vermont.gov/docketsandprojects/eeu/rfpsandcontracts/2000-2002/eeucontract
Efficiency Vermont Contract 2003-2005
http://psb.vermont.gov/docketsandprojects/eeu/rfpsandcontracts/2003-2005/eeucontract
Efficiency Vermont Contract 2006-2008
http://psb.vermont.gov/docketsandprojects/eeu/rfpsandcontracts/2006-2008/eeucontract
Efficiency Vermont Contract 2009-2011
http://psb.vermont.gov/docketsandprojects/eeu/rfpsandcontracts/2009-2011/eeucontract
[iii] VEIC Order of Appointment:
http://psb.vermont.gov/sites/psb/files/orders/2010/Att_to_Order_of_App_for_VEICPFD2010-12-20.pdf
[iv] See Vermont Public Service Board, Smart Metering and Alternative Rate Design:
http://psb.vermont.gov/docketsandprojects/electric/7307
[v] "Climate Change in Your Pocket," Scudder Parker and Frances Huessy
http://www.aceee.org/files/proceedings/2012/data/papers/0193-000191.pdf
[vi] "Taking the Efficiency Utility Model to the Next Level," Blair Hamilton
http://www.veic.org/resource-library/taking-the-efficiency-utility-model-to-the-next-level