The Utility of the Future:
Facilitating "Customer Equity" in an Emerging Energy System

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ABSTRACT

Most discussions of the *utility of the future* proclaim the value of efficiency and renewable energy as key features and drivers of new utility models. They then focus on the evolution of a business model that promotes and regulates monopoly capital investment, driven for decades by energy sales. These discussions generally fail to address the need for sustained, customer-engaged support to maximize the potential for distributed resource development. There is, however, just such support already in the energy efficiency marketplace. The sustainable energy utility is an emerging delivery model, one that takes the future out of the *utility of the future.* It is here. What it has in common with traditional distribution utilities is that it meets customers' energy needs and it delivers significant benefits to society. What differentiates it from distribution utilities is the nature of its relationship to capital investment and its engagement with the customer, technologies, and markets.

This paper discusses the experience of the emerging sustainable energy utility (SEU) model in one jurisdiction, and addresses SEU performance and opportunity in others. This examination is an approach to mobilizing customer investment, integrating distributed resources, and clarifying the interaction between increasing customer empowerment and the evolution of the traditional energy production and delivery systems. This model has already begun to yield nation-leading levels of energy efficiency investment. The paper also discusses possible regulatory and business approaches for allowing an investor-owned utility with strong distributed-resource capabilities to play an effective role as an SEU.

Introduction

This paper is grounded in an emerging vision of new electric, natural gas, and efficiency utility structures. We have begun to glimpse how they could evolve as engines for addressing the critical issues of climate change, energy affordability, energy security, and energy justice. How can we adapt and supplement them to address these issues now, let alone 20 years from now?

We are in a time of dramatic change in energy markets and technologies, just as we are witnessing a stunning inability at the federal level to set clear policy direction on energy and climate change. States, however, have an opportunity to develop and demonstrate solutions that meet their changing needs, strengthen their economies, and provide a constructive path forward. Done well, this effort would offer a hopeful alternative to policy gridlock and dangerous investments in "solutions" that will actually aggravate the problems we face.[1]

[1] Of course, there are many vital roles federal policy can, and ultimately must, play. But we do not have to wait for federal policy to get started.

This vision involves the following components:

1. **Least-cost planning, with efficiency first.** What must continue: aggressive prioritization of the efficiency of energy use as the least expensive, most reliable, cleanest "resource." The systematic acquisition of efficiency benefits needs to consistently expand *to all sectors of the energy economy*.
2. **Renewable generation.** What must occur: Integration of renewable energy production (electric and thermal) and combined heat and power (CHP)—both at the utility scale and in distributed (customer and community-scale) applications.
3. **Strategic electrification.** What must occur: Increasingly, replacing combustion energy with electric applications that have higher system efficiencies, lower costs, and improved environmental performance. These involve promotion of heat pumps, transportation electrification, and other strategic measures.
4. **A networked electric system that is intelligent, dynamic, and designed to mitigate risk.** A vital need: A revised version of the traditional "natural monopoly" electric utility that offers interconnection and reliability. This new version will include dynamic load management; demand management and storage for ensuring energy reliability; mini-grids; effective use of energy at times of availability; and strategies that enhance system optimization. It will include pricing strategies and payment systems that accurately reflect these values to customers. It will also involve strategic use of many energy forms and will use new information technologies for active engagement with customers.
5. **Energy justice.** What must occur: The economically disadvantaged are not generally part of the discussion about the *utility of the future*. They should be. The utility of the future, like the system of distribution utilities that began more than 100 years ago, must serve all customers. Distributed resources can uniquely empower customers, but in some scenarios could aggravate inequities.

In combination, these attributes of a new energy vision represent a shift from an economic model whose goal has been the maximization of energy production at declining unit costs. The new model seeks an economically, environmentally, and socially sustainable energy development path. This path can reduce cost and risk, and forcefully address climate issues.[2]

One of the primary attributes of this new model is that both efficiency and generation investment in customer facilities is at least as high a priority as investments in new energy production and capital projects (replacement generation, new generation, transmission, pipelines) (Binz et al., 2012). Integration of the two becomes a central challenge for the utility of the future.

History

To understand how utilities might evolve into this new model, we need to revisit their original rationale and the economic models and regulatory structures that formed them. As customer-focused services expand through energy efficiency, they are increasingly including a broader definition of *distributed resources*.[3] As this evolution continues, we need to understand

[2] For a deeper discussion of the climate context, see Parker and Huessy, 2012.

[3] Throughout this paper, the term *distributed resources* refers to customer and community level options. It primarily involves energy efficiency, small-scale generation (including small CHP and renewables) demand management, storage, and fuel substitution strategies.

the historical concept of *demand side management* and the original rationale for having an entity—generally, utilities—undertake this effort. Energy utilities offered the prospect of efficient operations, as nearly "natural" monopolistic, chartered entities that were, in exchange, subjected to regulation (at least theoretically) to maximize public benefits and provide service at "just and reasonable rates."[4]

Demand side management (DSM) on the other hand, emerged from the growing recognition in the 1980s that the monopoly energy delivery system was actually *increasing costs and multiplying risks*, while systematically under-valuing alternative strategies to provide beneficial, reliable, energy service to customers. As they pursued economies of scale to increase production and drive down unit costs of energy, utilities (and often regulators and policy makers) frequently ignored a wide range of externalized costs and the potential benefits of alternatives. They failed to compare options and risks consistently, across the lifetimes of these decisions. Introducing energy efficiency as an option for meeting customer needs was not primarily about new CFL bulbs or about wrapping hot water heaters. Instead, it was about introducing the virus of least-cost planning[5] among all energy options into the body of the well-muscled utility industry and its regulatory framework. **Making efficiency a player on the energy field, along with generation, also helped stimulate an impressive wave of innovation and technological advancement that is now continually creating new "efficiency supply."**

It seemed appropriate to use the regulatory structure to force utilities to "overcome market barriers" to the adoption of energy efficiency. This provided benefits to customers, the system, and the environment. But the economic rationales underlying monopoly energy service and energy efficiency work are profoundly different.[6] Thus, although there are understandable historical reasons, there is no fundamental economic logic for housing the efficiency effort in the regulated monopoly utility. It has been more a matter of regulatory opportunity and convenience, and a continuation of the utility relationship with the customer, rather than a logical extension of the utility role in supplying energy to ratepayers.

[4] *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. See Greenfield, 2010.

[5] In Vermont law, Title 30 of VSA **§** 218c**.**(a)(1), a "least cost integrated plan" for a regulated electric or gas utility, calls for a way to meet the public's need for energy services, after safety concerns are addressed, at the lowest present value lifecycle cost. This includes environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission, and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs.

[6] Obviously, much effort has been devoted to overcoming the inherent disincentive for traditional utilities to promote more efficient use of their commodities. That topic is relevant to, but not the focus of, this paper.

Comparisons between traditional utilities and the emerging model are shown in Table 1.

Table 1. Traditional utility services compared to the emergent efficiency utility

Utility provides	Traditional utility: "Serve the customer"	Energy efficiency: "Empower the customer"
Definition of *service*	**Reliable electric service** • kWh and capacity • Transmission / distribution maintenance • Billing / customer support	**Trusted support for customers / markets** • Deep technical knowledge / expertise in hundreds of technologies / markets • Dynamic program / service design • Independent expert technical assistance • Incentives / financing / marketing • Metering /verification
Primary infrastructure	**Capital assets** • Generation / related services / procuring supply • Transmission • Distribution / reliability • Discrete service territory	**Build and support market solutions to overcome market barriers / failures, and create new services** • Regulated for the public benefit • Not logically coincident with service territory • Understand customer value proposition • Identify savings opportunities and strategies to address them • Train trade allies / support new services • Develop market channels • Track / assess results • Work in coordination with political and regulatory institutions
Definition of *public good*	**Natural monopoly** • Provides service at "just and reasonable" rates • ,Preserve "economic fairness"	**Coherent investment strategy to identify and overcome market barriers to adopting energy efficiency and other distributed resource options** • Acquire immediate, cost-effective energy resources • Transform markets over time • Economic fairness and opportunity to participate in EE

Evolving Roles

In the 1990s, "restructuring" and "re-regulating" utilities were espoused as a way to bring innovation and new forms of energy service and new customer options 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.

Investment in efficiency declined in this period—dramatically, in some parts of the country. However, Vermont, Oregon, and other jurisdictions advanced the alternative concept of obtaining deep, independently delivered, and sustained investment in efficiency services, via a regulatory shift that treated these services as a necessary *public good.* It did not treat them as another service offered by a monopoly, even though the term that was used for efficiency, *demand side management,* was a counterpoint to utility terminology about supply side management. 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 evolution of DSM to a comprehensive effort that supports customers and helps develop markets for energy efficiency services—and a progression of other customer-involved services—is the historical development that must be front and center as we discuss the utility of the future.**

Investment in efficiency continues to be recognized as a way of meeting energy needs at a lower cost. But its emergence as a resource option on a par with, but distinct from, utility investment in generation, transmission, and distribution represents a potential maturation that is undervalued, and often goes unrealized. Thus its potential for providing a full suite of distributed resource support for customer investment is often ignored.

The Vermont Energy Investment Corporation (VEIC) is the nation's first franchisee to operate as an energy efficiency utility (EEU).[7] The utility has operated under the name *Efficiency Vermont* for fourteen years, delivering energy efficiency services to customers in fulfillment of the legislative and regulatory requirement to provide those services that continues for what were originally 22 electric utilities in Vermont (total population 626,000). Cumulative efficiency savings through 2013 now represent over 13% of Vermont's electric supply. Efficiency Vermont operated under a contract with the Vermont Public Service Board from 2000 to 2010, when the Board issued an Order of Appointment for VEIC to deliver Efficiency Vermont services in rolling 12-year cycles as a franchised entity. The work of Efficiency Vermont has matured, and a vision has begun to emerge for both expanded services *and* new and complementary partnerships between the evolving monopoly energy utilities and the EEU.[8]

This new form of service reflects the fact that in the utility context *infrastructure* no longer refers simply to reliable supply and delivery. *Infrastructure* now includes trusted information and support for customers and markets on the broad range of energy options available to them. This new partnership is helping re-define the role of utilities. The customer-involved energy services provided by Efficiency Vermont, and by innovative municipal utilities and SEUs—and in some cases, by leading investor-owned utilities—create a new dynamic in the energy marketplace. It can systematically mobilize and help direct the high potential value of

[7] *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 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.

[8] The term *sustainable energy utility* refers to a not yet fully realized entity or function that delivers electric and thermal efficiency services; and which might provide or support delivery of a full range of distributed resource services. The term e*nergy efficiency utility* typically is used for an entity that primarily provides electric and thermal efficiency services. Here, we use the term s*ustainable energy utility* or *SEU* to emphasize the forward-looking nature of this discussion.

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.

Effective energy efficiency implementation operates best through market engagement that empowers customers and market actors to provide new technologies and services that the ordinary operation of markets has not facilitated. This 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 a few cases) more than 30 years. Not surprisingly, their program effectiveness has evolved over this time. However, the concept of the SEU highlights the potential for serving customers and suggests the possibility of a whole new dimension of relationship between customers and distributed resource providers. Effective SEU implementation will have the following attributes:

1. **Understanding the customer and building a relationship of trust.** This comes first. Continually seeking new understanding of customer interests and needs, and thereby learning where the opportunities for efficiency can add value, must be the fundamental orientation of the effort.
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 making efficiency choices.
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 open to and actively supportive of 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 providing objective information that does not inappropriately promote a "monopoly" fuel, and on the other hand does not "sell" a specific product.
6. **The SEU should become a one-stop portal for customers' energy needs.** Comprehensive efficiency services should involve all-fuels services, non-energy benefits, water savings, waste reduction, fuel choice, and renewable energy guidance, demand management, fuel substitution, and energy storage. These are increasingly expected by customers. In Vermont, for instance, customers have already requested support for fuel substitution support, transportation efficiency, and integration of renewables.
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 support (not enforcement), tax policy, and legislative and regulatory action, must be part of a comprehensive efficiency effort. The SEU must be aware of the broader policy, regulatory, and market contexts.

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 advanced metering infrastructure (AMI), for example, and from sub-metering, be put to use to increase efficiency, use utility infrastructure effectively, and provide new opportunities for savings? 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, availability, and timely use of energy in its various forms? Are there ways to use information about natural gas (and unregulated fuels) and electricity use to save on both 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. 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 is likely that the methods for measurement and verification change—becoming more "real-time" and more accurate.
10. **The SEU consistently supports and develops strategies that will help customers find affordable financing for their investments.** Efficiency programs have devised "financing" strategies, but without significant success. There is an urgent need to develop these tools in a way that supports the massive, necessary level of new investment in customer facilities.

The emergence of these tools for customer empowerment and customer-based energy solutions challenges the economic structure and the culture of the traditional supply utility.[9]

The Value of the Regulated Context

So far in this discussion, we have focused on the significant structural differences between the traditional utility and energy efficiency efforts. However, it is also essential to recognize the strong historical interconnections between them. **Efficiency programs, the model of the efficiency utility, and the emerging concept of a sustainable energy utility would not have been possible without the monopoly utility regulatory structure as a framework within which they could be born, grow, and mature.** Monopoly utility structures (informed by innovative policy leadership) have actually become the "incubation centers" for the introduction of this approach to identifying and systematically addressing market barriers and failures. There is no comparable institutional invention emerging for other energy sources (petroleum for delivered fuels and transportation, for instance). The transportation sector (which has many features of the regulated energy utility structure) has found it impossible so far to grasp and implement a coherent least-cost approach to planning and service delivery. There are several important reasons that least-cost planning emerged and "grew up" in the utility sector:

[9] These issues are the topic of a significant and helpful new set of studies described as "America's Power Plan" funded by the Energy Foundation: http://americaspowerplan.com/the-plan/.

1. **Utility regulation has a history of making energy decisions "affected with the public good."** Because of the monopoly regulatory framework, and the legislative guidance directing it, there is sometimes the opportunity to address cost, social equity, and environmental and economic issues in other than an immediately political context. The idea that efficiency could provide service at lower cost and less environmental impact at least made its way into the debate about how energy needs might be met. The regulatory framework offers a formal energy planning and decision-making structure that has allowed efficiency to be not just considered but eventually institutionalized.
2. **The concept of "system benefits" is much clearer and easier to quantify in a regulated utility framework than it is in a market-dominated energy sector.** We can, for instance, calculate the benefits of efficiency to reducing supply cost, capacity cost, transmission and distribution costs, line losses, and market price effects.
3. **Efficiency is less invisible.** Efficiency still suffers from the conceptual challenge of being a "negative supply." It is, however, still possible to calculate a unit cost for efficiency that can be directly compared to (and is reliably cheaper than) the actual price of supply. It is obviously possible to calculate savings from transportation fuel efficiency or weatherizing oil-heated homes. But a coherent effort to determine benefits from these efforts and use them to make better choices, system-wide, is difficult.
4. **Accounting for affordability and access to adequate energy in a more formal context are possible.** Advocates for energy justice have historically been able to win some victories in rate design, disconnection protections, rate discounts, and bill payment support in the regulated context. Although efforts for economic justice exist in other energy sectors, they are not within a regulatory framework and may have less institutional staying power. Energy efficiency programs have generally evolved with a high priority for addressing low-income efficiency opportunities. This has occurred in part through the assumption that energy justice is part of a broader public good that should be reflected in the operation of the utility. It has also reflected the understanding that efficiency opportunities should be made available to all customers.

Three other features of the regulatory context support evolving efficiency efforts in critical ways: funding, customer data, and evaluation / monitoring / verification (EM&V).

Funding

Because efficiency, from its inception, has been defined in the regulatory context as a resource, there has been an accompanying source of revenue available to fund the required investments to acquire that resource. This funding has certainly not always been adequate or reliable, but it represents a different level of investment from that for any other legislatively created "program" to provide energy efficiency services. Certainly political forces have at times seized portions of these funds for other purposes. However, utility efficiency funding is still much more plentiful and reliable than any other publicly funded effort. In fact, certain forms of independent energy efficiency delivery systems (Wisconsin, New Jersey, and the province of New Brunswick) expose efficiency funding mechanisms to *higher* levels of risk of political seizure than do utility programs. To date, Vermont's efficiency effort is funded primarily through a system benefits charge on customer bills; it is clearly identified as a utility customer resource, as opposed to revenue from taxation. It has avoided significant legislative re-direction.

Whatever evolution of the SEU we pursue, identifying and maintaining a stable source of funding is critical. Bold, innovative action that is unable to make the case that it is providing a real resource at an affordable cost is not likely to survive.

Customer Data

No serious resource acquisition effort in energy efficiency (and distributed resource mobilization more generally) can get where it needs to go without full access to customer utility data. Utility programs have these data by the mere right of being utility programs. Most energy efficiency utility models do not yet have full and active access to these data. This poses a fundamental challenge to their ability to fully support customers, to understand markets and participation levels, and to estimate energy savings. Efficiency Vermont and Energy Trust of Oregon do have access to customer data, with some restrictions on use and appropriate rigorous requirements about confidentiality. This access enables these SEUs to be proactive with customers. The critical role of data will expand in importance as AMI data become available. The importance of customer data to the efficiency effort cannot be over-emphasized.

Measure Characterization and EM&V

If energy efficiency is to be treated as a resource, the regulatory requirement to characterize measures, test cost-effectiveness, design programs for effective acquisition of savings—and then evaluate, track, document, and verify performance—are paramount. No government energy program approaches the level of accountability to which utility programs are subjected. Although there is much to be written about how this might be done better, documenting and demonstrating results is an essential discipline in growing a resilient efficiency infrastructure and maintaining public willingness to continue (and increase) funding it.

What Is Different about Efficiency?

The overarching regulatory framework to ensure public benefit from monopoly utilities has facilitated the evolution of efficiency efforts.[10] But it is also true that there are significant differences between the modes of operation of the traditional utility and the evolving SEU. This goes well beyond the widely acknowledged “through-put disincentive” of the traditional utility. The evolution of the efficiency utility model in Vermont, in the context of a separately chartered mandate, has brought these differences to the fore. Promoting efficiency is a service requiring very different skills from those needed by traditional energy utilities. The EEU needs to understand hundreds of technologies and markets. A traditional utility does not. The efficiency customers of an EEU are part of markets, not geographic service territories—and they need widespread market-based support. In most jurisdictions, utility efficiency programs are a small component of the utility operation and are not treated as an integral and essential part of utility service. More important, in many settings the efficiency effort is dominated by traditional utility priorities, which do not incorporate new learning about customers and markets that comes from aggressive efficiency investment.

[10] It has also played a role in fostering development of a wide array of distributed energy resources.

There are definitely jurisdictions where this is not the case. In some settings, the energy efficiency investment has reached a level of effectiveness that is recognized as a real supply resource. Similarly, in some utility settings, the level of commitment to efficiency and distributed resource development has begun to inform the thinking and emerging vision of the host monopoly utility. Nevertheless, the following concerns must be addressed as the relationship between monopoly service and the SEU functions evolve:

1. **Effective efficiency programs build relationships; they don't sell commodities (even though they promote new technologies).** Understanding this difference is the key to promoting efficiency. Customers invest in improvements to their energy use, and will view the opportunities and benefits from their own perspectives. Although an SEU will need to promote system and societal benefits, as well as customer benefits, its challenge is to translate those benefits in ways that effectively inform customer choices. The risk that utilities will use their monopoly position to promote offerings that primarily benefit them is a recurring concern as the "utility of the future" conversation proceeds. The SEU provides a trusted and independent third-party option both to promote innovation and protect customers.
2. **Efficiency and distributed resource strategies can and should rapidly move beyond the energy source(s) that a monopoly utility provides 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 a utility energy type should be as much on the customer's table as the utility's energy type.
3. **Efficiency benefits might be well beyond those recognized by a utility regulatory structure.** The traditional utility regulatory structure is not generally set up to recognize and account for efficiency across all fuels, or to value market transformation benefits and non-energy benefits—even though these could be immensely positive for customers, communities, and the environment.[11] Increasingly, other sustainability drivers, practices, and opportunities should be recognized and funded equitably in the delivery of SEU services.
4. **Efficiency services have become effective by recognizing opportunities for relationships that are traditionally 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. Leading utility efficiency programs are building these relationships. Many others are not.
5. **The larger system benefits that efficiency and distributed-resource strategies provide have been largely ignored in the planning processes of utilities and the regional transmission organizations (RTOs or ISOs). In some cases, these benefits are systematically disadvantaged in planning and investment strategies.** Utilities

[11] Codes and standards are a case in point. When energy efficiency programs 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." This effectively penalizes energy efficiency for this kind of market transformation effort.

have not been leaders in advocating for recognition of these benefits. In many cases, regulators and other policy leaders have been slow to recognize these benefits, as well.[12]

6. **Efficiency services are knowledge based and relationship based. They must be dynamic, flexible, and forward-looking.** 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 strategies that become mature. Utility efficiency programs can become too narrowly focused on meeting annual savings targets. Although the SEU model does not guarantee that this longer view of the effort is preserved, if it is well designed, it will provide sustained benefits from efforts that systematically develop new savings opportunities.

An Emerging Partnership?

In Vermont, where the energy efficiency utility has been in place for thirteen years, the "divorce" between the monopoly utility and efficiency programs has permitted a somewhat independent evolution of each respective function. They both remain subject to regulatory oversight. Interestingly, Efficiency Vermont has increasingly recognized that many of the ways it wants to serve customers--consistent with its broad efficiency mandate--will benefit from a closer working partnership with incumbent distribution utilities. Several examples illustrate this trend:

1. **AMI implementation.** Efficiency Vermont has worked closely with Vermont distribution utilities to support AMI implementation to 90% of Vermont utility customers. This will provide customer data to the utilities and Efficiency Vermont at intervals of between 15 minutes and an hour. The joint creation of consistent statewide management, transfer, and confidentiality tools for handling these data is under way. The design of efficiency, market, and customer-involved service planning of innovative demand management opportunities with these data is a new focus of Efficiency Vermont work. Increasingly, this work is being done in evolving partnerships with distribution utilities.
2. **Strategic electrification.** Efficiency Vermont is aggressively exploring the benefits of heat pump technologies for space and water heating and clothes drying. The potential for these new technologies provides a significant opportunity for improved energy performance, lower customer cost, and significant environmental benefits. In the transportation sector, Efficiency Vermont considers electric vehicles to be large mobile appliances. It has already drafted a Technical Reference Manual (TRM) for an electric charging technology that is more efficient than baseline. When approved, this "appliance" will be eligible for incentive support. Efficiency Vermont is also addressing with legislators and regulators the fact that these technologies could, despite their benefits, increase electricity consumption. Vermont utilities are also looking at these new

[12] In Watson and Colburn, 2013, the 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=.

technologies as a way to promote beneficial load growth, and the EEU is actively seeking appropriate ways to partner on such efforts.

Since Efficiency Vermont has also been charged in Vermont with providing thermal efficiency services for unregulated fuel customers,[13] the issues about conversion of water and space heating from fossil fuel to heat pump technologies create interesting regulatory and policy questions. Since there is no comparable "efficiency charge" on unregulated fuels, installing a heat pump provides a new justification for providing thermal efficiency services through the electric system benefits charge.

3. **Demand management.** There is little current priority for Efficiency Vermont to focus on demand management, but it is clear that strategic electrification could aggravate existing peak use times and create new peaks. It can also present opportunities to improve load shape and system utilization. Utilities, regulators, and Efficiency Vermont are charting a course toward demand management strategies that can improve system operation, manage distribution and transmission costs, and provide new value to customers. It is likely that Efficiency Vermont will work with utilities as they assess supply portfolios and costs and focus primarily on helping customers integrate load management into their facilities.
4. **Distributed energy production.** Although Efficiency Vermont does not have direct funding to support most renewable energy development, it is permitted to support cost-effective CHP projects.[14] With regard to both technology types, it is clear that customers seeking efficiency services are often also considering renewable energy and thermal / electric options. Account managers and customer service representatives need to include those interests and the customers' need for relevant support in the advice and service they provide. Vermont utilities are supporting aggressive net metering and renewable energy efforts and investing directly in renewable energy. Increasingly, Efficiency Vermont is drawn into joint planning and implementation efforts with distribution utilities on these matters.
5. **Distribution and transmission planning.** Vermont has been a leader in targeting efficiency services to distribution- and transmission-constrained areas. By law, Efficiency Vermont is part of a Vermont System Planning Committee (VSPC) that identifies areas where non-wires alternatives might defer or avoid system upgrades cost-effectively. The partnership among Efficiency Vermont, distribution utilities, and Vermont's transmission company, VELCO, present increasing opportunities for constructive planning and coordinated service delivery.
6. **Partnerships to promote affordability for vulnerable customers.** Vermont efficiency efforts have given priority to partnering with the state's augmented Weatherization Program and working with Vermont's aggressive affordable housing investment program. Building new partnerships with utilities to bring (for instance) zero net energy to low income Vermonters, and finding new ways to provide ESCO services to lower-use public facilities are high priorities of the Efficiency Utility.

[13] Regional Greenhouse Gas Initiative (RGGI) funds and Forward Capacity Market (FCM) funds are designated for unregulated fuel thermal efficiency in Vermont: primarily propane, heating oil, and wood. Process fuels are also included. Natural gas delivered by a single utility is regulated.

[14] It is also authorized to support some biomass heating applications.

Challenges to the SEU Model

This paper defines the different functions that are now embedded in what we refer to as *energy utilities.* It is not our assumption that the SEU described here can or should generally be created as a fully independent entity. What will be important is that the SEU functions be clearly identified and thoughtfully structured as part of delivering modern energy services. Although there can be significant benefits from a separate SEU, there are very real reasons why the VEIC or Oregon models may not translate readily to some other jurisdictions, for the following reasons:

1. **Policy or regulatory reluctance.** It might simply be that the comprehensive vision of customer service and partnership embodied in the SEU concept is not the policy of a given state or jurisdiction. Without clear policy and regulatory support, the creation of an SEU will be flawed and its operation unsuccessful. Inadequate funding, denial of access to utility data, hostility from incumbent distribution utilities and the lack of sustained regulatory support will cripple an SEU from the start.
2. **Incumbent utilities are doing a good job already.** In some jurisdictions, distributed energy services have already been significantly incorporated into the traditional utility model. Thus, it might make no sense to create a new entity for marginal gain. On the other hand, the need for independence, the focus on customer needs, and the risks of potential conflict of interest discussed above will need to be addressed in those jurisdictions.
3. **Alternative approaches.** Imaginative policy and regulatory approaches could devise options for providing the SEU services. These might involve a wholly owned or a jointly owned subsidiary serving multiple service territories that is separately regulated under a performance contract. Such a structure might also revise the regulatory approach to the parent company, creating some shared performance objectives to promote coordination.

Suggestions for the Future

We should approach the "utility of the future" discussion as a process of *transformation,* not simply as "damage mitigation." It could be that the emerging partnership between distribution utilities and the SEU functions is the best strategy for responding to markets and simultaneously avoiding massive new capital investments that customers and regulators might be unwilling to fund over time. This is not just a discussion about "adapting" current utility models to survive (although it is certainly about that, too). We need to build on what we are learning from the distributed resource efforts under way and turn the combined 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 new, long-term benefits from our energy system, we need to define our goals first, and describe the desired benefits. Then we should revise the current system to attain them.

In light of these considerations, whether the efficiency utility (and emerging SEU) functions are within an altered monopoly utility model, or are structurally distinct, should be a conversation about how to implement the newly articulated policy. There should be a thoughtful and conscientious process to distinguish and appropriately regulate their functions. If this is done

well, new opportunities for coordinated service will emerge that are critically important to creating the utility of the future.

Here are some possible joint functions the two services could deliver in partnership:

1. **Continue pursuing deep efficiency** to lower costs, diminish risks, and strengthen the resource portfolios of utilities.
2. **Jointly support increased renewable energy integration**, with the SEU focused on customer-sited applications and ways to ensure that their value is maximized.
3. **Develop strategies for providing affordable, deep efficiency and renewable energy services to all customers,** particularly economically vulnerable customers. In partnership with the SEU, use a version of traditional utility cost recovery mechanisms to invest in long-term affordability through energy and demand reduction for them.
4. **Develop strategic leveraging of market capital at rates reflecting their limited risk,** combined with on-bill financing to move efficiency, strategic electrification, and renewable energy aggressively into customer facilities.
5. **Jointly pursue aggressive demand management, system optimizing, and ancillary services** that use new energy management technologies that provide customer, system and environmental benefit and facilitate inclusion of high levels of distributed generation.
6. **Explicitly expand the SEU functions to include coordinated service among natural gas and electric utilities, unregulated fuels, and transportation energy.** This will involve fuel substitution, and will include important decisions about gas and electric infrastructure. This will also require acknowledgement of the potential and priority to use this partnership to attain broader societal goals.

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