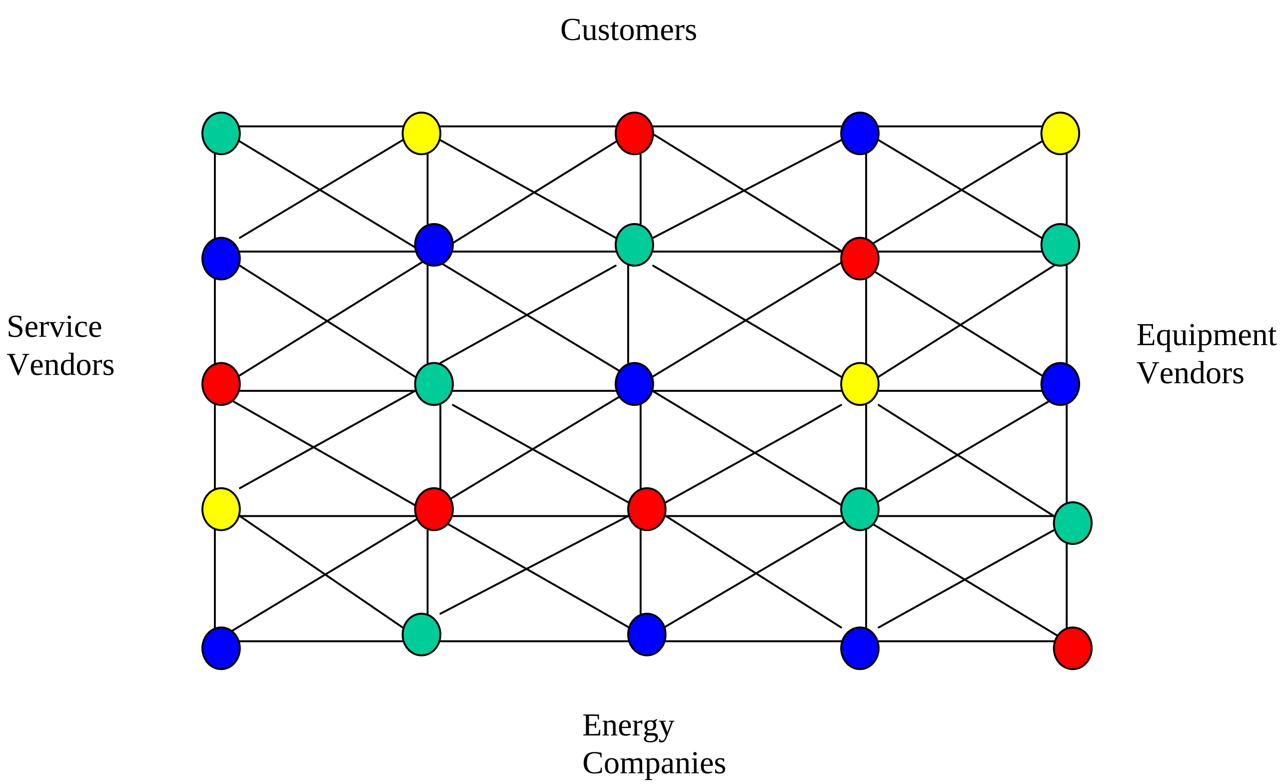
The Energy Customer Network:

The Strategic Integration of Energy and Information Delivery



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Executive Summary

The key strategic issue for every energy delivery company is: "what shall we become?" Many have answered "bare bones pipes and wires!" Running the energy infrastructure is an important function but it's a sterile vision. In this paper we outline an alternative that puts meat on the system's bones to create an interactive platform for energy customers and energy-related suppliers. Think of it as "pipes, wires and the web".

We call this concept the Energy Customer Network (ECN). ECN is a customer and supplier network management business. ECN addresses important needs and market inefficiencies. First, it reduces energy users' difficulty identifying, evaluating, and financing energy-related services and equipment. Second, it relieves the difficulty that energy service and equipment vendors have reaching potential customers. ECN provides many utilities access to otherwise unaffordable technology and enables them to generate new profits. ECN offers HVAC, lighting, distributed generation, and energy service companies an open, remote interconnection and channel that reduces customer acquisition and transaction costs.

ECN is a differentiated and a defensible business strategy. The ECN manager creates customer-specific knowledge and directs it to those who can provide value to customers. ECN differs from proprietary vendor-owned systems by being open and neutral. It differs from standard EIS systems by addressing supply as well as demand. ECN is compatible with existing facilities management systems. The system's scalable electronic footprint allows network members to expand beyond their traditional markets and franchises.

ECN is supported by innovative pricing, financing and risk management techniques. The working capital pressures that often distort EIS marketing and pricing strategies are relieved by bundling and securitizing the expected revenue flow from customers.

In a network business revenues can arise at any point and flow to any other through the network manager. Customers can pay suppliers, vendors can pay customers for information or provide incentives, aggregators can share revenues with participating customers, etc. Fees akin to shelf stocking and co-op marketing charges augment revenues from energy customers. Vendors may offer customers credits for actions such as renewable energy purchases that can be applied to future purchases or they may sponsor customer metering or diagnostic equipment in return for the information flow. Moreover, customers may receive payments either for sharing information with other network members or by coordinating their load management and self-generation activities with aggregators and ISOs through the network.

Once established in a region ECN would enjoy substantial barriers to follow-on competitors. Since the system is open and neutral, customers will have little incentive to enlist in another network. The network's value to members increases as it grows, generating more prospects for suppliers and more options and information to customers thus reducing incentives to switch.

Guide to this White Paper

This paper is organized into four sections in addition to the preceding executive summary.

- **The Need for New Business Models in the Energy Delivery Business**. Discusses the need for energy delivery companies to find new sources of growth and new platforms for interacting with customers commensurable with their strengths.
- **The ECN Business Model Structure**. Outlines the ECN business model; the flows of information, revenues and the value created.
- **ECN Economics**. Describes the profit drivers and levers on those drivers and identifies many of the revenue streams.
- **Target ECN Market Characteristics**. Overview of potential network members, the range of value propositions for each target segment.

The Need for New Business Models in the Energy Delivery Business

Is 2004 the comeback year for utilities?

The year 2002 was a year of reckoning: the top 100 companies managed collectively to lose over $100 billion of market value, report a negative two percent return on equity and an $8 billion operating loss. Hardly any of those losses came from traditional utility activities; they were the result of merchant plant operations, energy trading, foreign investments and retail initiatives such as HVAC and ESCos.

By 2003, Wall Street, the loudest former champion of utility diversification, began pleading with utilities to return to their core business. Many obliged, unloading disappointing foreign investments, exiting from non-utility businesses and promising to sweat their assets harder. We suspect that Wall Street's advice will be about as useful this time as when it encouraged bold new initiatives. Not because we think there is anything wrong with refocusing on the delivery business – we think it has a lot of untapped value – but many companies are refocusing on yesterday's utility business. If telecoms had focused on their "core barebones wire business" they would have passed on cellular, DSL and other engines of growth.

The delivery component of the utility business model has been relatively untouched by the information technology revolution. The delivery utility began in a no-choice world as the company store for an integrated utility and in most respects it still works that way. Utility customers and energy-related businesses communicate and interact with one another almost entirely in a linear, point-to-point, person-by-person manner that has high search, information and transactions costs.

To grow the delivery business you need to rethink its role and move from being the company store to being the customers' store. A customer-oriented store's role is connecting many customers to many suppliers. Not just energy suppliers but also the many energy related businesses that provide equipment, software and services. This calls for a network business model enabled by information and communication technology.

Two important business roles, the *strategic integrator* and *network manager*, are required to create this new business platform. The *strategic integrator* brings new technologies to bear on old needs and in the process reshapes a business and increases its potential value. The strategic integrator role need only be done once. The *network manager* uses the new integrated system model to market, build and manage a network of customers and vendors. The network manager creates value by connecting customers and suppliers, reducing their search and transactions costs and leveraging the portfolio benefits of a large, diverse network.

Some of the greatest success stories on the web, Yahoo!, eBay, and Google are examples of *strategic integrators* who created value by integrating new technology with old needs.

Each brought information network technology to people's need for finding and buying things they want and the need other people have to find those buyers. Each of these companies then successfully acted as *network managers* to market, build and operate a system or network of connections.

Similar system integration and network management opportunities exist today in the retail energy sector. There are a lot of unintegrated systems out there. Today's electricity system is a network only in the electrical sense that millions of customers are connected to thousands of power generating sources by a web of wires. The information side of the business is largely undeveloped. An informative and easy-to-use web site is a step in the right direction but it is not an information-based strategy.

Almost all utility efforts to extend their presence on their customers' value-added chain have been horizontal consolidation efforts including acquisition of engineering, HVAC, lighting and other businesses. As noted in the beginning, these have proved disappointing and are now being unwound.

Although utilities pioneered energy information systems (EIS) they have, with a few exceptions, either spun them off (e.g. Conectiv to Enerwise) or sold them (AEP's Datapult to Enerwise). One exception, ConEd Solutions, still operates a small system in their NYC service area.

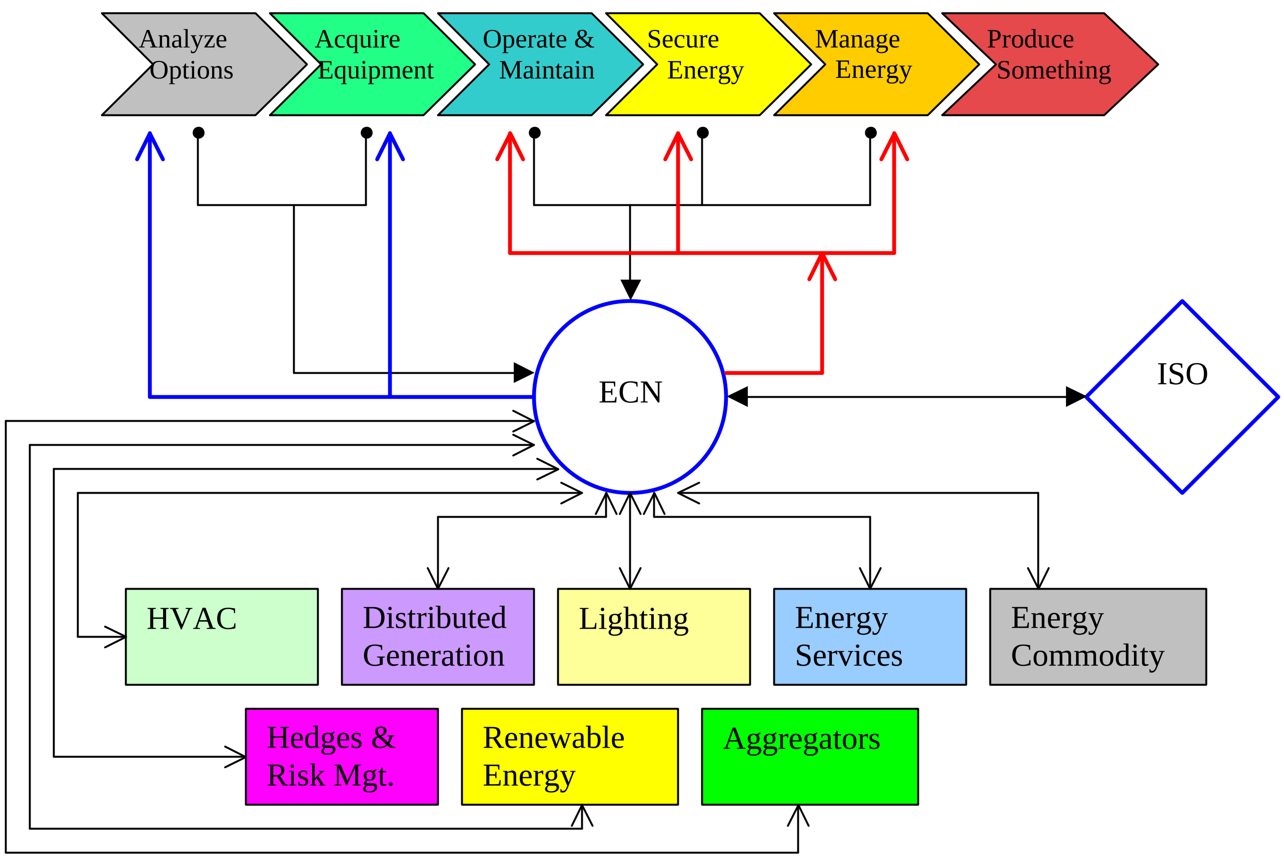
Most EIS outfits and some remote meter reading firms such as CellNet try to capture for themselves nearly all of the upstream value revealed by access to the consumption data. This limits their scope to what they themselves can do and their rate of growth by tilting sales efforts to home run sized customers where savings are easily demonstrated and captured. A business where marginal costs of operating and interacting are nearly zero and which should be driven to rapidly acquire as many points as possible remains hung up on long-sales cycle and high first cost applications.

Successful intermediaries, stores or network managers – whatever you call them – succeed by offering customers choice, information and convenience and offering suppliers customer access and information. They do not themselves try to make things (store brands not withstanding) and they do not stock only one kind of product.

The ECN Business Model Structure

ECN is an open, web-based network that connects customers with energy and energy-related companies. The representative value-chain for customer energy-related activities below illustrates the nature of customer information inflows and outflows at different points throughout the process from making capital investment decisions to producing useful products and services.

Typical Energy Customer Value-Chain



Connections Enable New Products and Services

Today customer energy-related information is under-valued because only its administrative value for billing purposes is recognized. Therefore customers, utilities and energy providers under-invest in information gathering, analysis and application. The ECN network enables information to be directed to those who value it most.

Many utilities have real time connections to their largest customers' meters and there are fragments of remote monitoring and control of customer-site equipment but for the most part there is little real-time or even near-time connection between the electrical and information systems. The systems that monitor the state of the network do not communicate with customers. Most utilities still rely heavily on customer telephone calls to detect outages and most customers are left in the dark about outages until the lights come back.

Customers could improve their energy efficiency tremendously and save a lot of money but they are confused about how to get the information they need. Even if they can secure the data, few are capable of evaluating it. Utilities don't see a return in providing that information. Suppliers that would benefit and solve the customers' problems have no economical way to sponsor its collection. Economists call this an externality- there is a value there – but none of the players can realize it under the current set-up.

Owners of distributed generation and curtailable load have repeatedly demonstrated that they will operate their units and equipment in harmony with the needs of the grid but are provided timely and accurate market information on the value of their action. Most existing "demand response" programs are inflexible and unwieldy. Customers can't self-aggregate into "mutual energy portfolios" that would have different "products" with varying trigger prices and operating constraints. (Companies such as EnerNOC, do network distributed generators, aggregate their output and coordinate with the local ISO but these are still rudimentary single-purpose networks).

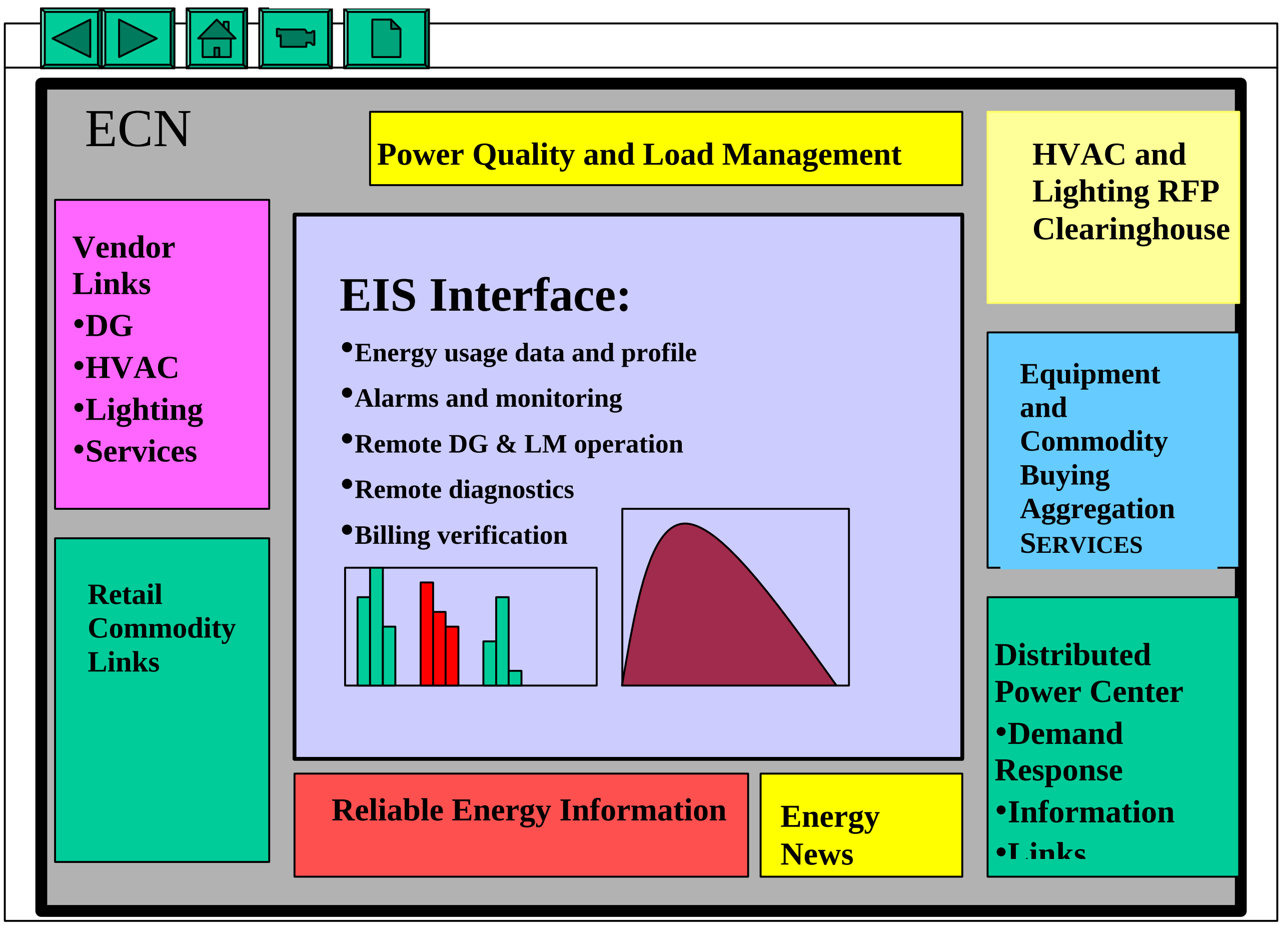
In addition to pulling together and extending existing fragmentary systems, the network will stimulate new products and services. It is impossible to forecast the fruits of networks members' ingenuity but a few illustrative examples might include:

- Vendors can monitor customer equipment without building an expensive proprietary system. This enables them to offer extended services such as enhanced warranties, predictive maintenance, etc.
- Customers can network facilities to get aggregate and comparative real time data.
- Relationship programs can be established. For example, a manufacturer may provide a prospective or existing customer with green tag credits or energy conservation credits applicable to a future purchase of its products.

How ECN Looks to a Customer

When customers sign on to their personal ECN web site they see a screen packed with information about their energy consumption, contextual advertisements and links to sources of information about energy and energy-related topics. A mock-up of a possible customer –interface is illustrated below.

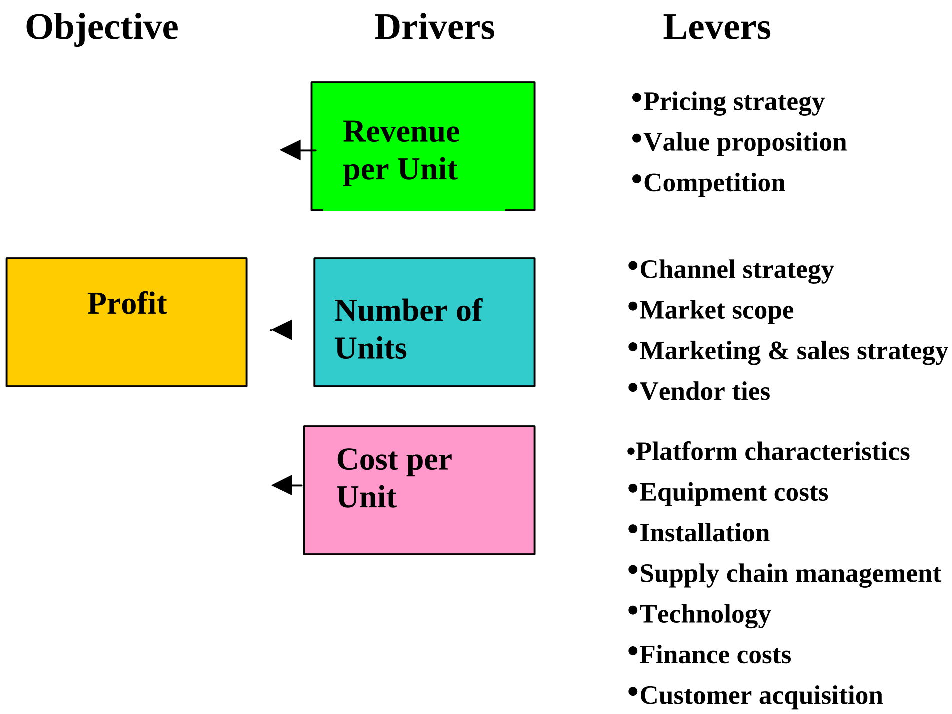
Energy Customer Network Interface



Energy customers can use the links to research energy topics, to join aggregation groups, get quotes on energy-related products and services and even conduct auctions among vendors. For those who choose to have their energy managed by third parties, they can access account information analogous to that available to a financial brokerage account.

ECN Economics

ECN profitability is driven primarily by three factors: revenue per unit on the network; number of units on the network, and cost per network unit as illustrated in the graphic below.

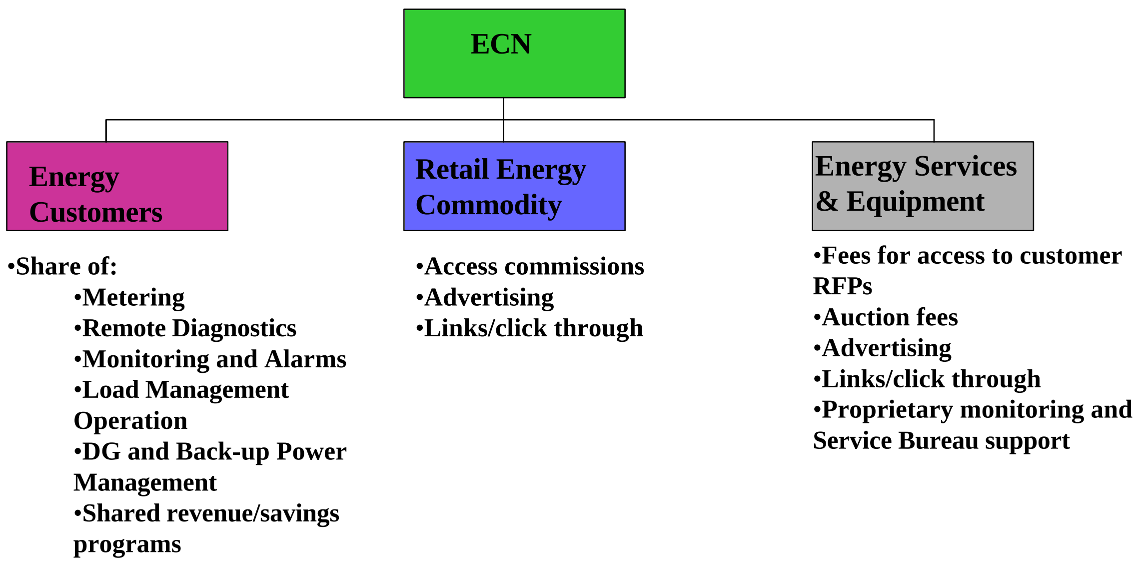


Several levers, some of which are shown in the third column above, in turn shape each profit driver. The ECN business development strategy is for the most part defined by these levers. Under the revenue driver for example, the ECN price strategy is directed at overcoming the first cost barrier holding many EIS systems back by securitizing installation costs, lengthening the recovery period and reducing periodic payments. In addition, vendors will be permitted and encouraged to "sponsor" customer metering or controls.

The value propositions offered by ECN extend well beyond the direct customer service of information gathering, monitoring, alarms or controls to include banner and contextual advertising, vendor network management tools, etc. In all likelihood just as eBay discovered that it had unintentionally become the B2B channel for small businesses and an open mall for thousands of retailers, we anticipate that the customers and vendors on the network will create many new products and services.

Unlike the standard EIS model, the ECN concept gives rise to a large number of revenue streams some of which are illustrated below.

Illustrative ECN Revenue Flows



Target ECN Market Characteristics

Three major groups would benefit greatly from participating in ECN:

- Small- to mid-sized utilities. Although some larger companies may be interested, we believe smaller companies are more likely to welcome a joint effort that enables them to offer their customers a valuable service and provides a new revenue stream.
- Mid-sized industrial and large commercial customers. The ESCos have heavily marketed the very largest customers, some of whom now have dedicated systems. The middle of the industrial and commercial sector has a lot of potential if offered the right value proposition.
- Energy service and product vendors. Distributed generation, HVAC, lighting, power quality and other vendors would welcome a way to connect with their widely distributed customers and prospects.

The Utility Market for ECN

In order to retain vitality, utilities need to move beyond the bare bones pipes and wires of their systems. They need to re-engage their customers and be seen as a force for solving customer problems. There are a large number of electric utilities who do not have the resources or competencies to serve as strategic integrators or network managers but would nevertheless like to offer their customers advanced energy products and services.

Many utilities have excellent customer relationships and brand equity, making them attractive candidates to serve as marketing allies and channels. As shown below, there are over 3000 electric utilities, of which perhaps 20 percent or 600+ would be attractive candidates to participate in an ECN program. There is no reason for these companies to each play a system integrator role and develop their own interactive customer system. Most don't have the resources or competencies and would benefit from a collaborative marketing program.

Electric Utility Type	*Number*	*Percent of Industry Revenue %*
Publicly owned utilities, primarily municipal systems	2012	15
Investor owned companies	239	76
Cooperatives, mostly rural systems	900	9
Federal power authorities such as TVA and Bonneville	9	1

Why would these companies go with a collaborative model like ECN rather than on their own? In part it is cost sharing and in part it is because the traditional EIS model has not produced satisfactory results. The traditional and ECN models are contrasted below.

	Customers	Finance	Products/Services	Competition
Traditional Models .	Mass market--huge cost to deploy; individual customer benefits rarely cover cost *Or* A few very large customers—high cost to serve, fixed costs spread over small base with low aggregate margin	Capital investment front- loaded Development and deployment financed out of corporate capital structure	Hardware only—limited market, no on-going revenue stream *Or* Total value chain—requires excessive breath of capabilities, forces customers to sever existing vendor relationships	HVAC and machinery suppliers, politically connected local businesses and trades
ECN	Middle market—large enough to justify cost, enough targets to spread fixed costs, moderate acquisition cost	Except for start-up, capital investment financed as incurred and recovered by capitalizing the revenue stream	Sell network connection & information to generate ongoing revenue stream Facilitation of 3rd party sales of related goods and services generates commission income	Hardware and service vendors become trade allies

Mid-Sized Commercial and Industrial Energy Customers

There are approximately 14 million commercial and 500 thousand industrial electricity customers in the United States. The number of customers who might benefit from ECN depends on the particular services offered. There are two primary groups of retail customers, identified by the nature of the product offer:

- Information and management services
- Load and power management participants (e.g. demand-response programs)

Information and Management Services

Metering is the gateway product for EIS. Over half of all commercial customers and over 80 percent of industrial customers would benefit from real time metering if the information provided enabled them to save as little as 10 percent of their electricity costs.

Preliminary analysis based a representative product portfolio comprising real time metering, remote monitoring and alarms, diagnostics and distributed power operation in a high energy price area such as New England suggests that about 55 per cent of commercial and 82 per cent of industrial customers could reasonably expect to breakeven or better with one or more of the products. These figures are very conservative and do not reflect the possibility of vendor-sponsored equipment or incentives which would reduce customer costs and increase the market potential.

Load and Power Management Customers

Obviously, this segment overlaps considerably with the information service market above. These customers would enlist in a load curtailment or self-generation program through the ECN which would act as an aggregator and coordinate with the ISO. (The ECN could also service other aggregators). The ECN increases the value of demand response programs for both customers and ISOs by enabling more customers to participate, increasing the size and reliability of the offered load and portfolio effects allowing for different curtailment products.

The attraction of customer load and power management offers depend of course on the regional or ISO level of avoided costs, the structure of local demand-response programs, and the share of the savings received by the customer. The load and power management benefits come mostly from the payment per kW (or avoidance of a kW ratchet) since interruptions and/or self-generation periods are relatively infrequent and short duration. Most programs have an annual reservation charge, also usually based on kW available for curtailment. These fees offset to some extent the additional investment necessary to execute the curtailment or self-generation order from the ISO or aggregator.

Energy Service and Product Vendors

While many commercial customers may not find it worthwhile paying for information about their energy using equipment, their suppliers might. Distributed generation, HVAC, lighting, power quality and other vendors would welcome a way to connect with their widely distributed customers and prospects. This is a very large ($24 billion +) and fragmented market, especially at the service level.

Otis introduced one of the earliest remote monitoring and control systems, enabling it to sense and respond quickly to elevator problems. Some building services companies already use remote monitoring and control systems. But most on-site systems by themselves cannot support dedicated or proprietary systems. An open ECN system would enable HVAC suppliers and others to offer higher value services and to deepen their customer relationships.

Conclusion

The energy market lags behind other sectors in using today's information and communication technologies. Today, there is no incentive for utilities to shoulder the burden of developing a modern energy information infrastructure. Therefore an open business model that meets the needs of many players across the energy sector is necessary.

There is a very large market for an integrated energy information and transaction network. Many utilities would benefit by offering their customers access to new products and services. The $25 - $30 billion energy services, HVAC, lighting and building controls industries would enjoy the benefits of an open marketing and communication system. Nearly 15 million commercial and industrial customers could have the means to manage their energy related activities more efficiently and enjoy access to competitive energy services and products.

The ECN business model outlined in this paper integrates the information and energy networks and brings value to all of the players in the energy sector.