Switching Perspectives: Creating New Business Models for a Changing World of Energy

Michael Valocchi, John Juliano and Allan Schurr

Abstract Traditional electric utility business models are becoming rapidly outdated. Policy changes, new energy technologies and more demanding consumers are driving the need to move away from purely operation-oriented approaches to more consumer-driven models. With these new business imperatives and a resulting need to focus on industry-level business model innovation, we explore how new models could evolve, and their benefits to consumers, utilities and other stakeholders. We also discuss the challenges ahead and the capabilities required for realizing this transformation.

1 Introduction

A century ago, the first great business model innovation in the electric power industry was set in motion with the move from small local plants delivering power over short distances to central generating plants delivering power great distances over high-voltage wires. This innovation was followed by a long period dominated by a "grow-and-build" philosophy that drove the development of near-universal access to electric power in much of the world through the mid-twentieth century. This philosophy reached its practical limit during the latter part of the century, due to factors such as plateaued economies of scale and practical optimum sizes of generating units,—but since then, there has been little evolution of business models from that of the "grow-and-build" years.

M. Valocchi
Philadelphia, PA, USA

J. Juliano (✉)
Washington, DC, USA
e-mail: juliano@us.ibm.com

A. Schurr
Denver, CO, USA

D. Mah et al. (eds.), *Smart Grid Applications and Developments*,
Green Energy and Technology, DOI: 10.1007/978-1-4471-6281-0_9,

Long-standing electric utility business models are rapidly becoming outdated in light of new technologies, policy changes and more demanding consumers. In the first part of the twenty first century, sustainable growth and efficiency have become imperatives newly demanded of the industry. Roles along the value chain are shifting, with traditional buyers gaining a foothold as value providers. These dramatic shifts all involve technological changes—changes that most energy providers understand. However, these shifts also require leaps into business model transformation that are new to most. To succeed in this new environment, industry model innovators will redefine traditional business models, as well as the infrastructure, rules and standards to facilitate the transition from traditional energy generation and delivery to more complex business models which incorporate emerging products and services enabled by new technologies. Important decisions on how best to make these moves—and the resulting rise to prominence of companies that successfully do so—will occur over the next decade. Understanding the evolving industry dynamics and how they drive transitions to new business models are clearly important from the business perspective. However, policy-makers who share with energy providers the common goal of transitioning to smarter grids must also understand these to and shape an environment that supports such development.

In this chapter, we first will present an overview of the ways in which the industry value chain is shifting in response to policy-, technology- and consumer-driven forces. We then will explore the new business model—industry model innovation (IMI) and focus on its structure, opportunities that IMI is poised to unlock for electric providers and strategies to realize the transition to this new business model in preparation for smart grids. This chapter will be concluded with policy recommendations for an efficient transition toward the new business model for smart grids.

2 Business Model Transitions and Drivers

With today's capital- and carbon-constrained environment, the imperatives of the industry have evolved from those relevant to "grow-and-build" economies, passive end users and one-way delivery of power toward those rooted in sustainable growth and efficiency, as illustrated in Fig. 1. Table 1 highlights the key differences between these two imperatives.

The main cause of such transition is the relentless pressure the industry faces to reassess its business models to accommodate transformations occurring in several key areas:

- *Government policy shifts*: Efficiency, conservation and renewable generation are receiving tremendous attention from governments attempting to meet goals related to climate change, energy security, and economic and job growth. At the same time, most industry revenue models are still based on a careful balance of the fixed nature of capital expenditures and variable cost recovery.

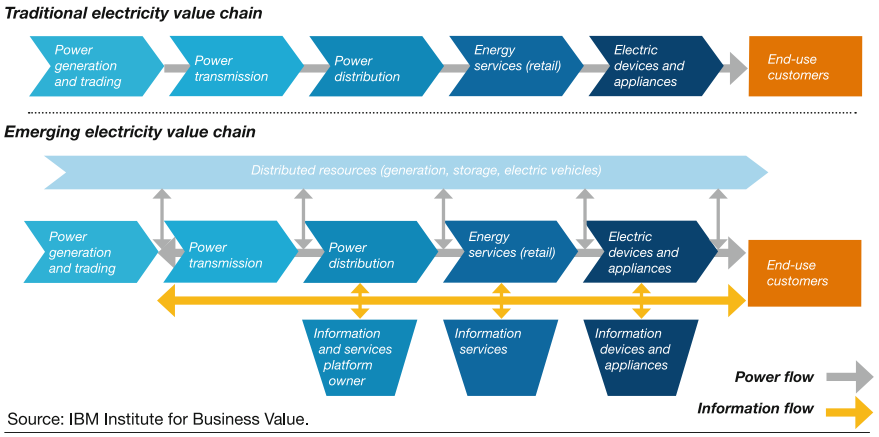


Fig. 1 A comparison of the traditional and emerging electricity value chains

Table 1 Difference between "grow-and-build" and "sustainable growth and efficiency" imperatives

	"Grow-and-build"	Sustainable growth and efficiency
Cost of Inputs	Low	Volatile
Infrastructure growth	Relatively unconstrained	Constrained by environment and public policy
Impacts of technology improvements on cost efficiency	Reduce generation cost	Little impact on generation costs
Generation basis	Large, centrally located units	Small-to-mid-size distributed units with storage
Perspective on resource acquisition	Assumed inexhaustible and benign resources	Assumed finite and harmful resources

The more successful these policies are in slowing growth in overall consumption from centrally generated sources, the stronger the need will be for new pricing models that can balance electric power companies' desires to support public policy objectives with revenue requirements to maintain service and reliability levels.

- *Changing consumer demands*[1]: As demonstrated in our previous reports "Plugging in the consumer: Innovating utility business models for the future," "Lighting the way: Understanding the smart energy consumer" and "Knowledge is Power: Driving smarter energy usage through consumer education," customers are now demanding more from their providers than merely reliable power at reasonable rates. Our global utility consumer surveys show consumers want more

[1] "Consumers" is used to refer specifically to residential and small commercial customers; "customers" is a more general term including large commercial and industrial users.

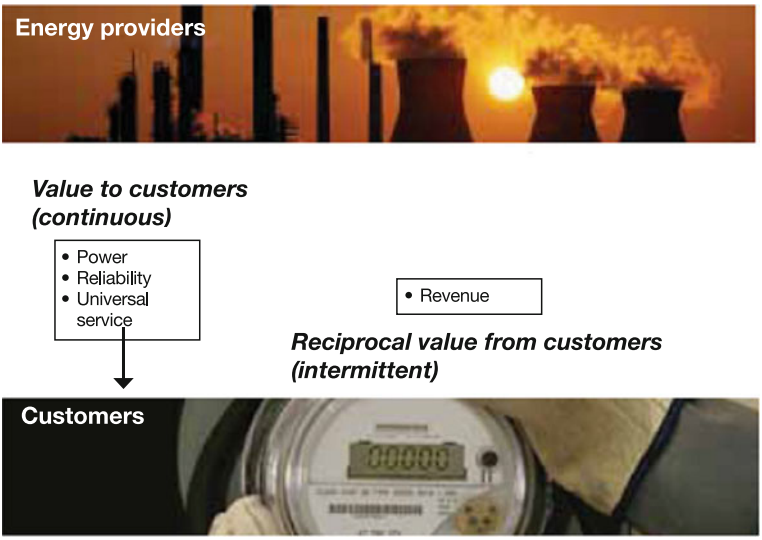
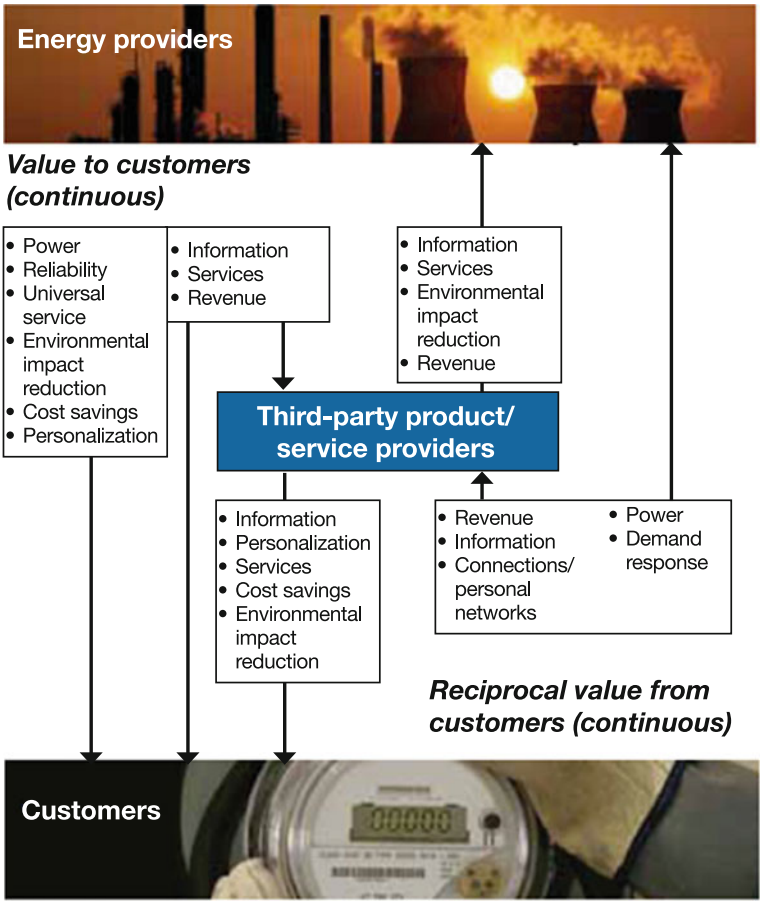


Fig. 2 Traditional industry value model

control over their expenditures and environmental impact and more information about their energy usage—both in content and frequency [10–12].

- *The emergence of new technologies*: The introduction of smart grid and other distributed energy technologies will add complexity to the network, moving power and information in multiple directions and enabling a host of new participants and business models. Distributed energy resources such as customer-owned renewable generation, plug-in electric vehicles and energy storage will extend the value chain to include assets operated closer to the end user. The end users themselves, who may be capable of providing some combination of demand response, power or energy storage to the system, will also be an active and empowered integral part of the new value chain (see Fig. 1). The new participants and business models derived from this new value chain will provide strong competition for existing revenue streams.

This recharacterization of the industry value chain will dramatically reshape the value proposition among energy, service and product providers, as well as customers of these enterprises and the *value model* of the industry as a whole (Fig. 2). A value model is the combination of value provided to customers and the *reciprocal value* received from customers in return [8]. In the case of the electric power industry, the traditional value model involves consumers receiving reliable and universal power at reasonable rates, for which they offer providers reciprocal value in the form of intermittent (usually monthly) revenue. In response to the



Sources: Jansen, Wendy, Wilchard Steenbakkers and Häns Jagers. *New Business Models for the Knowledge Economy*. Gower Publishing. 2007; IBM Institute for Business Value analysis.

Fig. 3 Emerging industry value model

changes in policy, customer demand and technologies, the emerging value model is more complex because customers have more to offer in return to power providers and other participants than just payment for energy consumed (see Fig. 3).

Some of these new elements of reciprocal value are primarily operational in nature; demand response, load profile flexibility, and distributed power and storage (where customers have these on their premises) allow for optimization of system performance and asset utilization. Others, such as information on energy consumption patterns, other consumer demographic and behavioral information, and

access to personal connections/networks for social content delivery are the foundation for new revenue sources for companies able to effectively leverage the information.

Not only are there many more types of reciprocal value, but also the very nature of the value has changed from an intermittent source of reciprocal value to a *continuous flow*. As the number and frequency of reciprocal value exchanges grow, the complexity of the ecosystem increases and the total amount of value in the system available for capture by ecosystem participants increases dramatically.

The flow and volume of information itself, along with new services it enables, are strong contributors to this continuous flow of new value. At present, there is little financial or operational value to the data generated by consumers (essentially total usage on a monthly basis) because it is too limited in scope and frequency of delivery to be of value to parties other than the electric provider's own billing and operations departments. However, the quantity, frequency and quality of data generated by consumers—and its usefulness to energy providers and third parties alike—are set to grow exponentially as smart grid infrastructure is deployed. Devices and software that capture, analyze and present this information to consumers and energy providers are already proliferating, and services that make use of this data are rapidly emerging.

3 Methodology and Framework

Using an extensive literature review, as well as our previous industry surveys and consulting experiences, we evaluated the decisions facing electric power companies as they address the business model-related challenges and opportunities before them. As the basis for this analysis, we chose a framework based on IBM Institute for Business Value research summarized in the report, "Paths to success: Three ways to innovate your business model" [6]. This report presented an analysis of 35 best practices, in which fifteen of them were from the Business Week list of leading business model innovators, including Apple, IKEA, Southwest Airlines and others [1]. The remaining 20 cases are selected based on a company's reputation for leadership in business model innovation according to analyst reports, interviews with experts in diverse industries and a broad literature review. The cases represent nine industries from different regions and with diverse types of business model innovation. Each of the cases was assigned with values of high, medium or low indicating the level to which business model innovation of specific types (industry, enterprise, and revenue) were leveraged. By taking into account financial performance and various factors, such as industry types, period of innovation, age of company and size of company by number of employees, revenues and assets, the keys to success in business model innovation were identified from these cases.

As a result of this work, we identified three main types of business model innovation strategies:

- *Industry model innovation*: Innovating the industry value chain by moving into new industries, redefining existing industries to serve new markets or creating entirely new industries
- *Enterprise model innovation*: Innovating around the structure of the enterprise and the role it plays in new or existing value chains, with focus on those areas of the business where it has an advantage and delivers value
- *Revenue model innovation*: Innovating how revenue is generated through offering reconfiguration (product/service/value mix) and pricing models [6].

4 Industry Model Innovation: Elements, Opportunities and Challenges

In our earlier publications "Plugging in the consumer," "Lighting the way" and "Knowledge is Power," we envisioned a future for energy providers driven by technology evolution and increasing consumer control. Analyzing the impact of different levels of progression in these two areas suggests four states through which the industry will migrate [10–12]:

- *Passive Persistence*: Traditional utility market structures still dominate, and consumers either accept or prefer the historical supplier-user relationship.
- *Operations Transformation*: Some combination of network and communications technology evolves to enable shared responsibility, but consumers either cannot or elect not to exert much control.
- *Constrained Choice*: Consumers take decisive steps toward more control but are limited to certain levers (technologies, usage decisions or choices in providers) by regulatory and/or technological constraints.
- *Participatory Network*: A wide variety of network and communications technologies enables shared responsibilities and benefits [10, 11].

Because of the high likelihood of increasing demand for control and information by customers and continual technological improvement and deployment, these two reports emphasized our belief that the end state for the industry is likely to be a Participatory Network [10, 11].

In the last few years, the pace of progress toward this new model has increased. Government mandates to upgrade and incentives to invest in the existing twentieth-century infrastructure have helped push aside some of the most critical barriers for moving toward a Participatory Network—particularly in places like the United States and China where direct government investment is being made. In addition, national and global efforts to standardize technological and communications specifications by organizations such as the International Electrotechnical Commission (IEC) and the U.S National Institute for Standards and Technology (NIST) help remove another barrier to progress. These developments—among others—have strengthened our conviction that some form of a Participatory Network is a

logical destination in the next decade. The most likely path is through IMI that results in extraordinary change to the *platforms* on which electric providers operate.

The term *platform*, as used here, refers to a common architecture (essentially, a design for products, services and infrastructure facilitating users' interactions) and set of rules (protocols, rights and pricing terms) that provide a standard foundation governing transactions among two or more parties [2]. In general, platforms provide a means for providers and buyers of products and services to interact and create value that could not be created otherwise. The platform lowers the costs of providing services by offering some level of standardization for transactions and reducing duplication.

In this sense, the electricity network was one of the earliest technology platforms. It provided a means for power generators to move their output to buyers, a means for buyers to accept delivery of the output, and a standardized technological specification (e.g., the 120 V/60 Hz and 230 V/50 Hz standards for electric power in the Americas and Europe, respectively) around which thousands of applications (for heating, cooling, lighting, mechanical power and so on) would be built over the years.

Many types of platforms exist in consumer and business information technology (IT), exemplified by the broader Internet platform and today's popular social networking sites. The use of platforms is sporadically seen in the telecommunications sector (e.g., the NTT DOCOMO i-mode platform) as well [4]. In each case, there are diverse participants and a common set of business processes that enable competition and new value creation.

4.1 Single-Sided Versus Multisided Platforms

Many platforms are *single-sided platforms*, with a seller at one end and a buyer at the other and, often, intermediaries (distributors) between them that transfer the product from buyer to seller without changing it substantively [4]. The electric power network has historically operated as a single-sided platform. Until the advent of wholesale generators, the business operated as the simplest possible form of a platform—the manufacturer (generating utilities), by virtue of owning the entire value chain from the point of input of fuel to the point of entry into the user's premises, sold directly to the customer with no intermediaries; in fact, some utilities also controlled the fuel production itself. The emergence of independent generators and pure energy retailers moved the power transmission and distribution network closer to a position where it did act in an intermediary fashion, transporting power from wholesalers for purchase and use by end users.

As new value is generated in the network through expansion of the value and reciprocal value exchanged, industry model innovators will develop new businesses that more closely resemble *multisided platforms.* In a multisided platform,

there may be multiple types of buyers and/or sellers—in fact, a single party can be both a buyer and a seller.

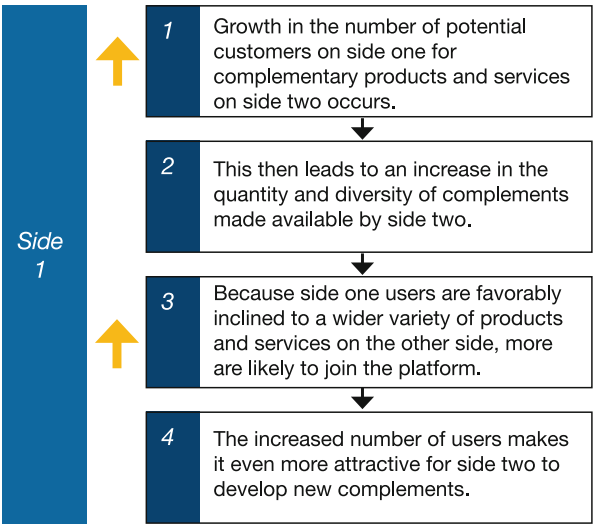
A shopping mall is an example of a multisided platform: manufacturers, retailers and shoppers all benefit from having a single location where they can meet and transact business. Malls provide common facilities, like restrooms and parking, which help lower costs to stores that otherwise would have to individually provide them. Since these economies help reduce costs to retailers, prices can be lower, benefiting shoppers [4]. A wider variety of stores and services brings more shoppers; more shoppers bring higher sales volumes for manufacturers and lower costs for retailers (and, in theory, also lower prices for shoppers). Thus, some element of network economy is bundled into the shopping mall value proposition. The platform owner (the mall operator) extracts some of this value in the form of rents to store owners and, in some cases, service fees to shoppers. (There are also organizations not directly involved in the mall transactions—credit card issuers, for example—that benefits and take revenue from the transactions.) But without all of the parties being involved, none would get any of the benefits.

Other examples of multisided platforms include newspapers (with readers serving as one side and advertisers another) and health maintenance organizations (with patients being one side and doctors and pharmaceutical companies serving as other sides). Yet another example is video games (with players being one side and developers, publishers, content providers, licensors, tools and middleware providers making up the other sides).

In coming years, a smart grid with energy and information flowing in multiple directions will provide support for interactions among all ecosystem participants, facilitating the development of electric power industry multisided platforms. These platforms will link energy suppliers, service providers, device manufacturers, application developers and end users (residential/industrial/commercial). Each group of participants needs access to a platform to reach the other groups, but a platform does not substitute itself for any particular participant.

Multisided businesses provide benefits to the interacting groups—while profiting from the transactions—by increasing and capturing *indirect network externalities* (INEs). Figure 4 shows how a multistep process stimulates these INEs in a two-sided market. In the first step, growth in the number of potential customers on side one for complementary products and services on side two occurs. This leads to an increase in the quantity and diversity of complements made available by side two. Next, because side one users are favorably inclined to a wider variety of products and services on the other side, they are more likely to join the platform. This makes it even more attractive for side two to develop new complements, and the cycle sustains itself [3].

This can be (and has been) a successful and profitable way to innovate industry models, allowing for additional value creation and profits throughout the value chain. However, as the builders of broadband infrastructure in the United States learned in the late 1990s and throughout this past decade, the entities that construct and maintain multisided platforms are not necessarily the ones that will reap all of the profits generated by such a model. For example, companies such as Amazon,



Sources: Eisenmann, Thomas and Andrei Hagiu. "Staging Two-Sided Platforms." Harvard Business Publishing. 2007; IBM Institute for Business Value analysis.

Fig. 4 Indirect network externalities in a two-sided market

Skype and YouTube benefited strongly from others' investments in broadband network infrastructure without taking part in the capital outlay for that infrastructure.

Because of their enormous investments in smart grid and other improvements, today's electric companies will, in a somewhat analogous fashion, be responsible for putting in place most of the infrastructure required for new industry participants to emerge. At the same time, it is likely that new electricity-related business models that leverage the smart grid infrastructure will be launched by entities that did not make direct investments in it. While it is healthy for the industry as a whole to encourage innovation in new products and services, incumbent electricity companies must be well prepared for this. Mapping out business models that take advantage of the new network-enabled capabilities will allow electric companies to reap as much of the ecosystems' new value as their ambitions permit.

4.2 Platform Development in the Electric Power Industry

Up until now, the electric power industry has not had much reason to create multisided platforms because product delivery has been a purely physical process; both energy and information flow have been unidirectional; and the typical end consumer had little desire to communicate with providers other than through

Ecosystem function	Participating sides	Platform providers
Carbon capture and storage (CCS)	Generators, carbon product users	CCS plant operators
Carbon disclosure reporting	Governments, NGOs, consumers, utilities	Third-party reporting organizations
Demand response	Consumers and businesses, distribution companies/utilities	Demand response firms
Electric vehicle charging	Consumers, power retailers, automakers	Public space providers (malls, parking garages, etc.)
Electricity comparison shopping	Consumers, power retailers, advertisers	Portal providers
Electricity transport	Power retailers, energy users, distributed generators	Transmission/distribution companies
Energy aggregator/marketer	Consumers, power retailers	Energy aggregators
Energy broker	Power retailers, energy users, distributed generators, generating companies	Energy brokers/traders
Energy management	Consumers and businesses, energy management service providers, application and content providers	Device/system makers or portal providers
Energy storage	Distributed generators, energy users	Energy storage operators
Information aggregator (device based)	Consumers and businesses, providers of energy products and services, application and content providers	Device/system makers
Information aggregator (portal based)	Consumers and businesses, providers of energy products and services, application and content providers	Portal providers
Renewable/carbon credit aggregation/trading	Renewable generation owners, coal/gas/oil generation owners, power retailers, governments	Third-party market makers

Source: IBM analysis.

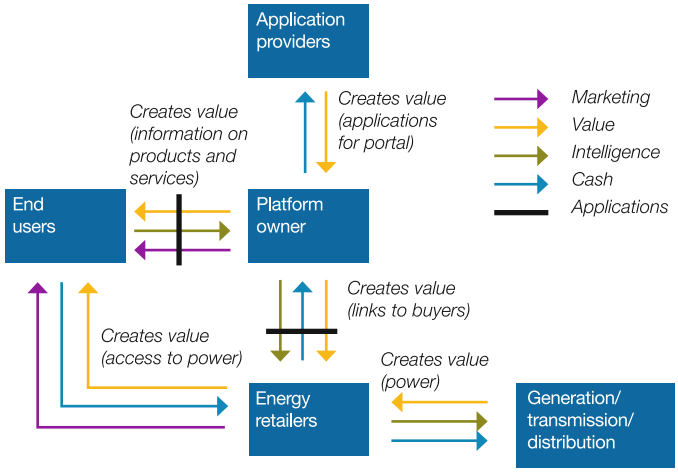
Fig. 5 Examples of potential multisided platforms in electricity

service provision, billing and problem resolution. All of this is changing. We expect a number of platforms will develop within the electricity ecosystem in the near future (see Fig. 5).

One-way value, information and money could be exchanged on these platforms is via an *energy marketing portal*, on which customers can shop for the best deals on power or for power that meets specific personal requirements (see Fig. 6). The platform owner creates value by providing the end user with access to various applications (for energy shopping, energy management, etc.) in return for passive usage and preference data, which the customer has approved for use for these purposes. This is delivered back to the platform owner through the applications for aggregation and presentation for the other side of the platform, the energy retailer.

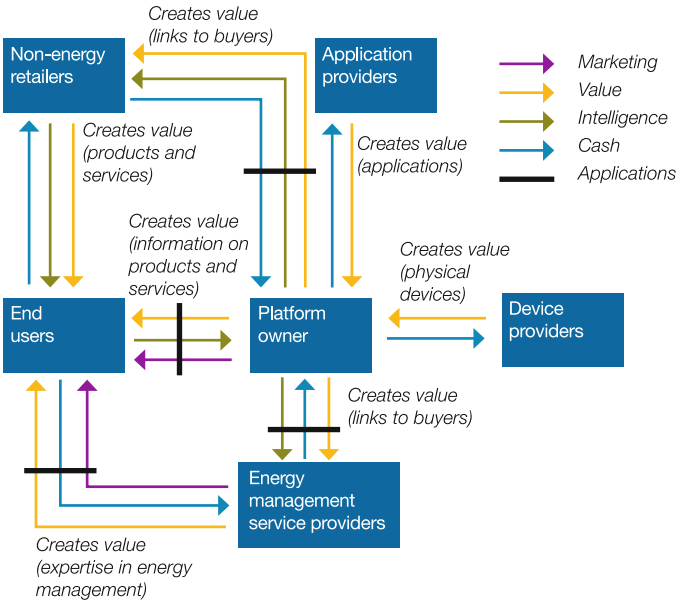
The retailer has access, through the platform provider, to a suite of applications to gain access to and evaluate the customer data. This information is valuable to the energy retailers, and they are willing to pay the platform owner for access to it to build marketing programs for products and services aimed at likely customers. Informed by the platform owner and the retailer side applications, retailers communicate their best offers to the buyers seeking deals or new programs. Ultimately, the retailer gets return for their investment in the platform—paying the platform owner for access and information—in the form of increased revenues from consumers who value the programs and services they offer.

A slightly more complex example involves an *information aggregator* (see Fig. 7). An information aggregator builds a relationship with end users by selling them (possibly at a subsidized price) energy usage display/management devices that are preloaded with useful applications, all of which are purchased from third-party developers. They thus serve as the link between device manufacturers and end users and between application developers and end users.



Source: IBM Institute for Business Value analysis.

Fig. 6 Platform example: energy marketing portal



Source: IBM Institute for Business Value analysis.

Fig. 7 Platform example: information aggregator

With appropriate permissions from consumers, the platform owner can also collect information about the end users' energy usage patterns, build profiles and market those profiles to energy and nonenergy (e.g., appliance) retailers. As with the energy marketing portal, the retailers are willing to pay for this information because of the benefits they accrue from it. The end users' profiles also include information on demand response they are willing to provide; this can be exchanged with the energy retailers for payment as the need for such response arises. Thus, cash can flow in both directions between retailers and end users, with the transactions in both directions facilitated by the platform owner.

Note that in these two examples, the platform owner is a company purely focused on the operation of the platform and the collection and exchange of data. Except for the end user, any one of the parties in the ecosystem can also serve as the platform owner—visually, this can be seen as "collapsing" the value exchange in the diagram for that party into the platform owner role in the center. For example, a device manufacturer could set up a multisided platform and take on responsibility as platform owner—including all interactions with application providers, end users and energy retailers.

4.3 The Platform Staging Challenge

A critical challenge can be encountered early in the development of new platforms when prospective users on each side are reluctant to actively participate until there are sufficient users on the other side. Often, the platform provider must "stage" the platform in advance, either heavily subsidizing one side to get it on board in sufficient numbers to attract the other side or by bringing on attractive or highly visible transaction partners to affiliate exclusively with the platform. When it works, profits can be enormous. When it does not, failures can be magnified by this investment. Also, in most instances where a platform can profitably exist, the combination of strong network effects and high barriers to entry means there is room for only a few platform owners (and, in some cases, only one).

Incumbent energy providers have an advantage in this market staging, as they already have a relationship with a critical mass of customers. Those customers could serve as one side of the platform in sufficient numbers to attract attention from application, service and device providers. This strategy is both less costly to develop and entails less risk than the approach a company starting from scratch must employ. Success is dependent on potential participants in the new network who are already customers of the platform owner on one side. The value of the products and services they already purchase is not dependent on the presence of a second side—this is certainly the case with electric power [3].

In this scenario, the platform owner facilitates transactions between the existing customer base and at least one new side of the platform, adding new functions, services or capabilities to its offering to the former to encourage transactions between the two. Google, for example, initially launched as a vendor of Web

search services (Google.com and others via license). In its first 2 years, Google's only source of revenue was from search engine license fees. However, after amassing a critical base of end users, it was in a position to offer paid-listing advertisements to these customers and transform into one of the most profitable multisided platforms that has emerged [3].

5 Capabilities Required for a Successful Transition

Companies that envision being platform owners will need to have key competencies in marketing, sales and customer relationship management. That fact, combined with the ready-made set of platform participants already present in the form of existing electricity customers, puts retail electric providers (or integrated utilities' retail operations) in a good position to take on the challenge of platform ownership. However, there are other requirements that are not necessarily in-house skills.

Software-based platform owners, like information aggregators and energy shopping portal operators, will need to master systems architecture and application interface development and support—or find a partner that can offer these services seamlessly to platform users. This assumes that the platform owner will cede the job of developing applications themselves to third parties interacting with the platform. If the platform owner instead plans to internalize application development as well, that adds another level of IT complexity (application development and support and IT infrastructure development and support). In either case, the company will need to ensure that its approach gives it a strong enough set of capabilities in these areas to successfully compete against rival platforms.

Service-based platform owners—such as energy management specialists—will have other challenges. These firms will have to transition at least that part of the organization to function more as a professional services firm than a traditional energy supply and delivery company, with requisite skills in solution creation and maintenance, knowledge and intellectual property management, research and development, and contract management. This will require a major cultural shift for a traditional utility, as the focus of management will be human and intellectual capital rather than physical assets and processes.

Companies willing to tackle IMI and sit at the nexus of new complex relationships among business partners and customers will be well positioned to create and capture new demand for emerging products and services. Strong growth in revenues and profits—albeit accompanied by some risks—is achievable in multisided business models because of the embedded network economies of scale (i.e., margins increase with network size). While several types of activities can serve as the basis for a multisided platform (as exemplified in Fig. 5), there are some common questions that potential industry model innovators need to address before making major investments.

How many platforms can effectively serve a single purpose? Where strong network economies of scale are in place and the cost of participating in multiple platforms is high for at least one participant, the likelihood is higher that markets will be served by a single platform. If this appears to be the case, a strategic decision about whether to fight for sole platform ownership or to pool resources in a platform shared with others must be addressed early and in depth. While "winner-take-all" economics make sole ownership of a platform attractive in theory, the reality is that only a company with extensive resources (especially for marketing) and strong existing relationships with a large number of potential users on at least one side will be positioned to succeed [2].

What are the incentives and costs for platform participants? Appropriate pricing, support and incentives for participants are critical success elements for any platform. A key question is whether any particular side requires subsidization and, if so, which one. Based on the history of past platforms from a variety of industries, the most price and/or quality sensitive participants and those with high visibility or attractiveness appear to be the strongest candidates for subsidization [4]. A firm able to leverage existing relationships as a vendor to one side may not have to provide strong subsidies. As for pricing, network economies of scale mean that underpricing platform participation will lead to suboptimal platform profitability; overpricing participation for any one participant will choke off growth and leave room for competitors to gain a stronger foothold in the marketplace.

What is the critical mass needed for success? Companies thinking of transitioning to a multisided platform model must be confident that the business model embraced is easily scalable [2]. Potential platform owners hoping to successfully leverage a vendor relationship to get a leg up on competitors should critically examine whether their current customer base is sizable enough to ensure this advantage can provide a meaningful head start and whether other territories can be easily integrated into the same side of the platform.

When should the move toward a platform-centered business model be made? In many platform battles (especially the ones that began in the dot-com era), gaining first-mover advantages was viewed as the most critical element of a business strategy. However, history has shown that later movers may actually benefit from standing back from the first wave. Google was neither a first mover in Web search nor paid-listing models, but it was able to leverage lessons learned from earlier proponents of each to improve on their efforts [2].

When and how should the move toward a platform-centered business model be communicated? Appropriately timing and managing the announcement of a business model shift is critical. Poorly handled or delayed announcements of major changes run the risk of surprising and angering investors, regulators and employees. This is particularly true for companies that have been operating a certain way for a very long period of time, as is the case with many traditional vertically integrated utilities. Conversely, communicating intentions too early may elicit strong competitive responses or lead to unrealistic expectations about future prospects for the business (and possible volatile stock price behavior for publicly traded companies) [3].

What cultural changes are required to successfully transition to a platform-centered business model? Leaders of electric power companies already understand the need for new workforce skills as the transition to a digital, information-driven industry environment takes place. However, companies transitioning to a multisided model should also prepare for cultural changes [3]. As discussed in the previous section, this includes some shifts in focus from physical assets and processes to human and intellectual capital. Additionally, companies might have to rethink their approach to customers, as explained by Amazon CEO Jeff Bezos:

> One of the things we had to learn through zShops [which host small merchants] and auctions was that we needed to think of ourselves as serving two different sets of customers. We pride ourselves on being customer-centric, but for years, 'customers' meant 'buyers.' As we began to operate auctions and zShops, we realized that these third-party sellers were equally important customers. And, it took a little while for the organization to learn what their needs were and how we could best meet them [3].

6 New Policy Approaches to Stimulate Platform Development[5]

While energy providers can and should move forward as answers to the questions above are developed, there are unresolved policy and regulatory issues that often hinder grid modernization, consumer choice and industry business model innovation. While the policy framework for the industry differs in substance and strength across the globe (and even across regions within a country, as in the United States of America), two areas stand out in their relation to acceleration of business model renewal in the industry.

How to reform the cost of service regulatory model: The current model favors investment in traditional grid assets like power plants, substations and "stringing more copper." These kinds of investments are still needed, but are likely to be insufficient to meet the system challenges of the future. This type of model has also over the years largely excluded energy providers from pursuing investments in unregulated businesses, which is clearly counter to the sort of growth-focused platform development outlined earlier in this chapter.

A strong alternative model that is more conducive to the future directions of the industry can be found in performance-based regulation, in which the regulator sets out specific metrics for energy providers and judges the prudence of investments based on success in achieving these metrics. A revenue premium is established to motivate overachievement toward these goals, while penalties are assigned for underperformance. The most effective performance-based regimes reform traditional regulatory models with an eye toward fostering disruptive change in business models by incorporating the following features:

- A realistic investment cycle, such as the eight-year price control period in the United Kingdom's RIIO performance-based regulation scheme [9]
- A clearly understood and measurable system of outputs for the utility for planning and investment, including but not limited to customer satisfaction, availability, reliability, environmental impact
- Strong financial incentives that drive both profitability and utility performance, such as annual revenue adjustments linked directly to outputs and basis point penalties for not meeting minimum regulatory outcomes; flexibility to provide customer choice for new regulated and unregulated products and services, using short-run marginal cost-based transfer pricing, is an important financial-related enablement mechanism

Balancing data privacy protection and market innovation: Appropriately designed industry practices and regulatory guidance can help the energy ecosystem protect sensitive information. On the other hand, enacting rules that make data access too difficult or too costly will effectively limit consumer choice and inhibit progress in delivering efficiency and conservation benefits, consumer choice, and desirable new products and services. Strongly expressed consumer concerns in recent smart meter rollouts [11, 12] (which our consumer surveys foresaw) make attention to privacy imperative, but an approach that also balances the needs of a new industry ecosystem can be achieved by:

- Making regulations flexible enough to accommodate fast-changing technologies and consumer preferences
- Making it easy for consumers to express their preferences
- Considering standard best practices from other industries regarding consumer privacy
- Considering a "Privacy by Design" framework at the operational level [7]

While some form of regulation is likely to persist in many parts of the world, failure by these regulators and policy leaders to allow energy providers the flexibility to develop unregulated businesses be active participants in the new platforms that will develop will put the regulated entities themselves in peril of being made obsolete by the new entrants gaining market share through these ecosystems.

7 Conclusion

The business models that brought the electric utility industry success in the middle of the twentieth century are overdue for revisiting. Much of the basis for their foundation—one-way flow of power and information, declining costs associated with increased usage, undifferentiated and passive consumers, unlimited access to inexpensive carbon fuels for generation and regulatory protection from threats to the core businesses—has already shifted or will do so in the next decade.

For those well positioned to be industry model innovators, the "grow-and-build" years are, in a sense, back—but with a different emphasis. What is being "built" are sophisticated new business platforms to support information exchange, consumer participation and new services. As with the generating units of the post-World War II era, these platforms can increase in profitability as usage increases. "Use more—we will keep building" will return as a marketing message to consumers—but this time around, the emphasis will be on information and services rather than energy.

Acknowledgments This chapter is an updated republication of the paper "Switching perspectives: Creating new business models for a changing world of energy" by Michael Valocchi, Allan Schurr and John Juliano, IBM. The copyright permission for reusing the paper has been granted by IBM.

References

1. Businessweek (2006) The World's Most Innovative Companies. Bloomberg Businessweek Magazine. Retrieved 3 Oct 2013 from http://www.businessweek.com/stories/2006-04-23/the-worlds-most-innovative-companies
2. Eisenmann T, Parker G, Alstyne MWV (2006) Strategies for two-sided markets. Harvard Business Review. Retrieved 6 Oct 2013 from http://hbr.org/2006/10/strategies-for-two-sided-markets/ar/1
3. Eisenmann TR, Hagiu A (2007) Staging two-sided platforms. Harvard Business School Background Note 808-004. Retrieved 6 Oct 2013 from http://www.hbs.edu/faculty/Pages/item.aspx?num=34746
4. Evans DS, Hagiu A, Schmalensee R (2006) Invisible engines: how software platforms drive innovation and transform industries. Massachusetts Institute of Technology, London
5. Futch M (2013) Power shift: smart grid transforms electric power for the 21st century. Georgetown J Int Aff 14(1)
6. Giesen E, Berman SJ, Bell R, Blitz A (2007) Paths to success: three ways to innovate your business model. IBM Global Business Services, U.S.A. Retrieved 5 Oct 2013 from http://www.businessmodelcommunity.com/fs/Root/8v2kj-Paths_to_Success_paper.pdf
7. IPC (2011) Privacy by design: from poicy to practice. Information and Privacy Commissioner, Ontario, Canada, Ontario, Canada. Retrieved 12 Nov 2013 from http://www.ipc.on.ca/images/Resources/pbd-policy-practice.pdf
8. Jansen W, Steenbakkers W, Jägers H (2007) New business models for the knowledge economy. Gower Publishing Ltd., Hampshire
9. Ofgem (2013) Network regulation—the RIIO model. Retrieved 12 Nov 2013 from https://www.ofgem.gov.uk/network-regulation-%E2%80%93-riio-model
10. Valocchi M, Juliano J, Schurr A (2009) Lighting the way: Understanding the smart energy consumer. IBM Institute for Business Value, New York. Retrieved 6 Oct 2013 from http://public.dhe.ibm.com/common/ssi/ecm/en/gbe03187usen/GBE03187USEN.PDF
11. Valocchi M, Schurr A, Juliano J, Nelson E (2007) Plugging in the consumer: Innovating utility business models for the future. IBM Institute for Business Value, New York. Retrieved 6 Oct 2013 from http://www-05.ibm.com/de/energy/pdf/plugging-in-the-consumer.pdf
12. Valocchi M, Juliano J, Schurr A (2012). Knowledge is power: Driving smarter energy usage through consumer education. IBM Institute for Business Value, New York. Retrieved 6 Oct 2013 from http://public.dhe.ibm.com/common/ssi/ecm/en/gbe03475usen/GBE03475USEN.PDF