Chapter 3: The Retail Market
Alberta’s retail market opened to competition in 2001. Prior to this, consumers purchased their power from one of three large vertically integrated utilities (TransAlta, Epcor and Atco) or from their local rural electrification association (REA) or municipality. Today—in addition to REAs and municipalities—three large and nine small retailers serve the province, offering small consumers about 50 electricity offerings. More than 20 companies compete to sell power to large commercial and industrial consumers, who use about 80% of the power consumed in Alberta (AESO 2010g).

Alberta’s large retailers are Direct Energy, Enmax Energy and Just Energy. Each of these retailers is or has been associated with one of Alberta’s major electric distribution utilities: Direct Energy with Atco Electric, Enmax Energy with Enmax Corporation (Calgary) and Just Energy with Epcor Distribution and Transmission (Edmonton).

Alberta’s nine small retailers are associated with the Calgary-based company Utilitynet, which also provides billing services to self-retailers.

Retail electricity providers sell power to 1.6 million sites in Alberta (DOE 2012i). These include:

- 1.3 million households (81% of the total sites)
- 107,000 farms (7%)
- 179,000 small businesses (11%)
- 17,000 large industrial sites (1%)

Homes and farms account for 88% of the sites served by retailers, but only 16% of the electricity sold in the province.

Since 2001, Albertans have been free to choose which company they wish to buy their electricity from. If they select a retail electricity provider, they enter into a retail service agreement (contract) that specifies the price they pay and the services they receive. Residential customers, farm customers and small commercial and industrial customers who prefer not to choose a provider are eligible to remain on a default rate (the Regulated Rate Option, or RRO) if they use less than 250,000 kilowatt hours of electricity per year. “Regulated retailers set their rate using a formula approved by the Alberta Utilities Commission. Competitive retailers set their rate independently.” (UCA n.d.-d).

For details about the number of customers on the default rate, see Table 2 on p. 39.

Types of Retail Electricity Providers

Retail electricity providers are the heart of Alberta’s industry. Like any competitive business, retail electricity providers only survive if they serve customer needs. Providers who best meet customers’ needs succeed in the marketplace.

Although every provider faces the same business realities, retail services can be provided in several ways.

Regulated Rate Providers

By default, Albertans who have not chosen a retailer automatically buy power and receive service from the regulated rate provider designated for their region of the province. The price offered by default or regulated rate providers is called the Regulated Rate Option—the RRO.

The service provision and rates of RRO providers are regulated by the Alberta Utilities Commission, which allows these providers the opportunity to recover all their reasonably incurred costs plus a reasonable profit margin from consumers. The way the regulated rate providers obtain power from the market is specified by the Regulated Rate Option Regulation, and the price they charge their customers is determined by market conditions.

Under the Electric Utilities Act, distribution utilities are responsible for providing the RRO to eligible customers in their service territories. Distribution utilities have the option of providing the RRO directly or through a designated agent.
While Albertans are free to choose their retail electricity provider, they are not free to choose the distribution system owner (wires owner) who delivers electricity to their homes and businesses.

- Epcor provides the RRO in its own Edmonton-region distribution service area. It is also the designated RRO provider for FortisAlberta.
- Enmax provides the RRO in its Calgary distribution service area and in Cardston, Crowsnest Pass, Fort Macleod, Ponoka and Red Deer.
- Direct Energy is the designated RRO provider for Atco’s distribution service area.

Default Suppliers

Large customers who use more than 250,000 kilowatt hours of electricity per year are not eligible for the Regulated Rate Option. Large customers who have not signed agreements with retail electricity providers receive electricity from default suppliers at an unregulated rate (AUC 2008). Default suppliers are free to set the rates, terms and conditions for their customers.

Under the Electric Utilities Act, distribution system owners are responsible for providing service-territory-specific default supply services to large customers who have not signed agreements with retail electricity providers.1

Competitive Retail Electricity Providers

Competitive retail electricity providers offer their customers a variety of price and service options. “Customers can choose the retailer that offers them the best combination of price, services and features suitable for their particular needs” (Alberta Resource Development 2000, p. 4). Examples of customer service features could include green power, time-of-use meters that bill consumers at one rate during peak hours and a lower rate during off peak hours, flexible payment dates and one-stop shopping for services such as electricity and natural gas (Alberta Resource Development 2000, p. 4). Some of these features are currently offered by Alberta’s retail electricity providers, who may be major corporations or small, locally based “niche” or “boutique” retailers.

Rural Electrification Associations

Rural electrification associations (DOE 2012f; Alberta Agriculture, 2012a) are not-for-profit rural cooperatives that provide and distribute electricity to their members. A number of REAs also offer competitive electricity contracts to their members (Alberta Agriculture 2012f).

In the 1940s, the Alberta government encouraged the establishment of local electrification associations to meet the post-war demand for electrical power in rural areas (Glenbow n.d-a). At that time, Alberta’s large, investor-owned utilities were busy establishing power service in heavily populated parts of the province (DOE 2012b [presentation]), and it was not profitable for them to supply electricity to farm homes (Shulze 1989). The only way farmers could get electricity was to form cooperatives and build power systems on their own.

With financial help from the provincial government, they installed poles and wires and operated their member-owned electricity systems directly or through contractual arrangements with utilities companies.

Six small rural power cooperatives were established in Alberta by the spring of 1945 (Shulze 1989). That year, farms constituted less than 1.5% of customers served by the province’s major utilities companies.

Alberta’s first REA was established in 1948. Today, 41 REAs serve more than 43,000 members across the province. Seven REAs (representing 63% of REA

1 Under the Roles, Relationships and Responsibilities Regulation, distribution system owners must appoint a competitive retailer to be the default supplier their service areas.
members) are self-operating, which means they own, operate and maintain their wires, and sell power to members through competitive contracts or regulated rates. The remaining REAs own their wires but contract maintenance and operations to the investor-owned utility that serves their part of the province.

REAS BY THE NUMBERS

The 20 REAs in the Atco service territory of northern and east central Alberta serve nearly 10,000 members. One self-operating REA is included in this number. It serves nearly 1,400 members.

In the FortisAlberta service territory of southern Alberta, 21 REAs serve more than 33,000 members. Six self-operating REAs are included in this number. They serve nearly 26,000 members (Alberta Agriculture 2012).

Unlike Alberta’s investor-owned utilities, REAs do not have a designated franchise area. Rather, their role is to establish service through wires investments made through the cooperative and to provide power to their members. REAs provide these services within their traditional service boundaries.

In the past, people who lived in a rural area where there was an REA had to be members and receive power from that REA. Now that investor-owner utilities offer services in rural areas, some rural residents receive their power from Atco or FortisAlberta. In addition, some REAs wish to serve customers who are not members. The issue of rights to customers has become a matter of contention in some parts of the province: REAs are claiming rights to serve non-members, while utility companies are claiming rights to serve customers who live in traditional REA areas but do not wish to be members or to receive services from REAs. Until this issue is resolved, consumers in some rural areas face barriers in accessing retail energy services of their choice.

Self-Retailers

Customers can act as self-retainers to obtain electricity for their own use (AESO 2012k; Electric Utilities Act). Self-retailers must be capable of handling the required electronic business transactions. Most self-retailers rely on billing agents to provide this service.

Retail Requirements

Retailers who wish to sell electricity in Alberta must meet a number of requirements (AUC 2008; DOE 2012f):

- They must be licensed by Service Alberta (under the Fair Trading Act) and post a $1 million bond.
- They must abide by a code of conduct set by Service Alberta, which outlines strict rules with regard to issues such as customer confidentiality, fair treatment and the marketing of their retail services.
- They must post security deposits with the Alberta Electric System Operator (to buy electricity from the power pool) and with the Natural Gas Exchange or other brokerages (to purchase financial hedges on their contracts for supply).
- They must post security deposits with each distribution company (for using their wires).

Oversight

Alberta Agriculture and Rural Development

Alberta Agriculture and Rural Development provides regulatory oversight of the province’s rural utility cooperatives, including rural electrification associations, and ensures compliance with the Rural Utilities Act. The ministry works with REAs on matters of governance, providing advice on best practices and resolving disputes between members.

Alberta Department of Energy

The Department of Energy develops acts and regulations that guide and support the development of a competitive retail electricity market.

2 In the electricity industry, security deposits are called prudential requirements.
Chapter 3: The Retail Market

Alberta Utilities Commission

The Alberta Utilities Commission regulates electricity distribution system owners and RRO providers, setting their rates and approving their terms and conditions of service. The AUC also develops and enforces service quality standards and rules on matters relating to the conduct and operation of Alberta’s retail electricity market. It facilitates the standardization of business practices with regard to system settlement, tariff billing and other matters (AUC 2012 [presentation]). System settlement (load settlement) rules define how the Alberta Electric System Operator bills retailers for the energy they purchase for their customers. Tariff billing rules define the information that distribution systems must provide to retailers so that the latter can produce accurate customer bills.

Market Surveillance Administrator

The Market Surveillance Administrator has broad powers of surveillance, investigation and enforcement in the electricity industry. The MSA monitors Alberta’s retail market, and is particularly active in monitoring energy procurement under the Regulated Rate Option. The MSA is also responsible for enforcing the Code of Conduct Regulation that governs the relationship of retail electricity providers and their customers.

Service Alberta

Service Alberta provides consumer protection services through its administration of the Energy Marketing and Residential Heat Sub-metering Regulation under the Fair Trading Act. The regulation requires that retail electricity providers (except for rural electrification associations) be licensed\(^3\) and post a security bond as high as $1 million. It specifies a code of conduct for marketers and lists specific information (including cancellation rights) that must be included in service agreements between retailers and their customers.

Utilities Consumer Advocate

The Utilities Consumer Advocate provides customer advice and mediation services in utility service disputes, and represents small consumer interests in regulatory hearings before the Alberta Utilities Commission. Through its website and print publications, the UCA ensures Alberta consumers have the knowledge and tools they need to make informed choices about purchasing electricity. The Utilities Consumer Advocate also represents Alberta consumers’ interests in regulatory hearings before the Alberta Utilities Commission and in policy discussions with the Alberta Department of Energy and related Government of Alberta agencies.

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\(^3\) The annual licence for electricity marketers costs $1,000.
The retail electricity provider is the point of contact between the electricity system and the electricity consumer. Most Albertans purchase electricity from a retail electricity provider.

### Overall Responsibilities

Retailers sell electricity to their customers. To do this, they provide the following services and perform the following tasks (Electric Utilities Act; UCA n.d.-d)

- buy the electricity their customers need
- arrange for energy delivery and metering services for their customers through agreements with distribution system owners
- produce monthly customer bills based on meter readings that report their customers’ electricity usage
- keep records and manage customer accounts
- collect payment from customers, including charges for electric energy, energy delivery and other fees
- provide customer services

Retailers can also provide a range of electricity services, limited only by their creativity and customer demand.

### MANAGING VOLUME AND PRICE UNCERTAINTY IS KEY.

Selling electric energy is a “continuous consumption” business like selling water or natural gas. When retailers accept new customers, they do not know exactly what volumes of electricity these customers will consume at any time in the future. The customers don’t know this either, even though the volume uncertainty is driven by the customers’ own actions.

Retailers also have to manage price uncertainty. Electricity has the most volatile and uncertain prices of any commodity, sometimes jumping from $0 to $999.99 per megawatt hour and back again in a few hours. Price uncertainty has nothing to do with customers’ actions: it is driven by external market forces.

### Energy Procurement

The energy procurement practices used by RRO providers are established in legislation.

Retail electricity providers buy large volumes of electricity from the power pool or from electricity forward markets, then sell smaller packages of electricity to their customers (UCA n.d.-a). Their procurement practices typically include a combination of long-term and short-term purchases. Purchase are made in a number of ways, some of which include trading through electricity brokerages and stock exchanges such as the NGX (Natural Gas Exchange), purchases from the power pool, bilateral agreements with generators, power purchase arrangements (for terms up to 2020) and requests for offers.
In Alberta’s market structure, retailers are automatically supplied with whatever energy their customers require and are charged the hourly pool price. (Section 5(1e) of the Electric Utilities Act ensures that this pool price flow-through option is made available to retailers.) Since the pool price changes hourly and can be extremely volatile, many retail service providers offer their customers price insurance in the form of fixed-price offerings. The two main ways retailers can provide fixed-price offerings are through financial instruments or through bilateral agreements.

In principle, financial instruments are the most efficient method of managing price risk. Where markets have many willing buyers and sellers, they enable the transfer of risk to the parties best able to manage it. Financial instruments generally cover specified energy volumes, which places the volume risk on retailers. Bilateral agreements between generators and retailers appear to be the most common risk management tool in Alberta.

**Billing**

Retailing electric energy is essentially a financial process in which suppliers invoice retailers for the electric services that their customers have used, and retailers bill customers for the services that they have used.

Section 112(1) of the Electric Utilities Act stipulates that only a retailer or affiliated retailer can bill a customer. Customer bills include the cost of the energy purchased from the retailer. Bills also include delivery charges from the distribution utility that builds and maintains distribution wires, delivers electricity, reads meters and answers emergency calls. The tariff billed by distribution system owner includes the cost of distributing electricity from the distribution substation to the customer’s meter. It also includes transmission charges, which the Alberta Electric System Operator bills to the distribution system owner, and which the latter passes on to the retailer, who passes them on the customer.

Each calculation is simple—but every customer’s invoice is based on thousands of detailed calculations. To handle this volume of information, retailers need very large computer systems specialized in handling Alberta’s unique rules and complex electronic business transactions.

When a customer switches to a new retailer, the retailer sends an electronic transaction to the local load settlement agent notifying it of the switch. From that date forward, the new retailer will be invoiced for the customer’s energy usage, and the old retailer will no longer be charged.
Purchasing energy for customers and delivering energy to customers are separate functions. Although retail electricity providers purchase the electricity their customers need, the physical delivery of electricity to customers’ homes and businesses is the responsibility of distribution system owners who maintain and operate local electricity lines. Electricity distributors accept electricity from the transmission system at various points of delivery, where interval meters measure the electricity by the hour (AUC 2011a). Cumulative meters at customers’ homes, farms and businesses measure the total amount of electricity used in a month. Load settlement agents allocate this energy into an hourly distribution that can be used for billing purposes.

**Meters and Meter Reading**

Smaller customers have simple cumulative meters that record only the amount of energy used. These meters are read monthly according to a fixed schedule. As a result, smaller customers’ rates can have only two components: a per-unit energy charge and a per-day fixed charge.

Larger customers have more complex interval meters that record the amount of energy used between monthly meter readings. These meters also record the highest rate at which energy was used during the month. This rate, called “peak demand,” is used in bill calculations. Peak demand can be compared to the maximum speed at which the family car was driven in the last month. It measures something that may have happened only once in a given period. Since transmission and distribution systems must be permanently sized to meet each customer’s peak demand for electricity, demand charges continue from month to month whether or not the customer consumes electric energy. Like the cost of an engine sized for passing when needed, this capacity cost has to be paid for whether it is used or not.

Since meters are not read on calendar-month boundaries, distribution companies carry out standardized calculations to estimate each customer’s calendar-month usage. These standardized estimates can also be used to estimate consumption when customers switch retailers or move in or out. Most importantly, they can be used to calculate hourly energy charges flowing from the hourly pool price of power. This is the basis of load settlement.

Alberta’s largest electricity customers have interval meters that record the amount of energy used in each hour. This makes it possible for the Alberta Electric System Operator to charge these customers the hourly pool price without any intermediary load settlement calculations. It also allows large customers to change their electricity usage patterns when prices are high.

Smaller customers in Alberta do not yet have access to interval meter technology, although it has already been introduced in jurisdictions such as Ontario and Texas.

**Load Settlement**

Load settlement is the process through which the distribution utility’s metering function and the retailer’s billing function are brought together. The end result of the load settlement process is the determination of the hourly consumption of electricity for each customer in Alberta.

“Distribution system owners are responsible for conducting load settlement calculations within their service areas” (AUC 2011a, p. 16). Atco, Enmax, Epcor and FortisAlberta act as their own load settlement agents. In the remaining six zones of Alberta, each distribution system owners has authorized a third party to conduct load settlement on its behalf.

Load settlement information is provided to the Alberta Electric System Operator (AESO), so retailers and regulated rate providers can be invoiced for the electricity they purchase for their customers and exchange through the power pool. It is also provided to retailers and to regulated rate providers so customers can be billed for the electricity they use. The AESO is responsible for the financial settlement for all electricity exchanged through the power pool at the pool price. “Because the wholesale pool price varies on an hourly basis, the AESO must bill retailers for their customers’ electricity consumption according to the hour it was used” (AUC 2011a, Appendix 2, p. 16).
Electricity distributors accept electricity from the transmission system at various points of delivery, where interval meters measure the electricity by the hour (interval meters). (AUC 2011a). Except for large consumers, electricity customers in Alberta have cumulative meters that measure how much power was used in the one-month period since the meter was last read. The load settlement agent must allocate each customer’s monthly total in any given month. Load profiles are used to make this allocation. Sometimes these profiles are based on the typical consumption patterns of comparable consumers; sometimes they are based on information recorded by the interval meter at the point of delivery from the transmission system to the local distribution system.

Further calculations follow:

Hourly customer consumption, plus the estimated distribution line losses, will never equal the metered hourly consumption at the point of delivery. The difference is called Unaccounted for Energy (UFE). UFE is calculated and converted to a percentage that is then applied to the profiled consumption of each customer with a cumulative meter and to the measured consumption of each customer with an interval meter.

At the end, the load settlement agent has the information by hour by customer to provide to the AESO, so that the AESO can determine how much electricity each retailer must pay for (AUC 2011a).

## Financial Flows

Retailers receive two types of invoices: one from the local distribution utility and one from their suppliers of electric energy. In the simplest case, a retailer receives just two invoices, one from the local distribution company for distribution services and one from the Alberta Electric System Operator (AESO) for electric energy. These invoices are both calculated according to rules approved by the Alberta Utilities Commission in an open public hearing process.

Load settlement agents gather electricity consumption data from customers’ meters and allocate this across the hours in a month. The allocation is provided by the AESO, and forms the basis of the invoice the AESO sends retail electricity providers to recover the cost of energy the providers have purchased for their customers. The AESO’s invoices to each retailer are based on the hourly energy consumption of each of the retailer’s customers. When retailers pay these invoices, the AESO forwards the money to the generators who produced the power, and the circle is closed.

The local distribution utility also calculates the retailer’s invoice for transmission and distribution services. When the retailer pays the utility’s invoice, the utility forwards the money to its various suppliers, and remits the transmission tariff to the AESO. The AESO pays the appropriate transmission facility owner based on that owners invoice. The circle is closed.

In its simplest form, a retailer’s business is a straightforward matter of paying supplier invoices and collecting the money from customers. The devil is in the details. Retail invoices are part of a river of data that is unlike anything anywhere else in the world. Retailers need large, complex, Alberta-specific systems to function. These business system requirements have been a major barrier to the growth of the electricity retail market. The Retail Market Review Committee’s recommendations for removing this barrier are presented in Chapter 7.

### Energy Charges

When retail electricity providers receive AESO invoices, they use customer-specific metre data and the terms of their agreement to bill their customers for the cost of energy. Customers pay the retailer. The retailer pays the AESO. The AESO pays the generator.

### Delivery Charges

The retail electricity providers receives invoices from distribution system owners, and most customer-specific retailers flow these distribution and transmission charges directly through to their customers. Customers pay the retailer. The retailer pays the distribution utility. The distribution utility pays the AESO for the cost of transmission. The AESO reimburses the transmission facility owner.
Energy Services: The Retail Markets of the Future

The path from the generation of electricity at the power plant to the purchase by the consumer seems complex, but the consumption of electricity is even more complex. The complexity lies in the thousands of choices that millions of people make every day with regard to end use devices that use electricity. Each individual has different end use devices and each uses these devices in different ways.

For much of the past century, the electricity industry lumped all consumers together into what it called the “load” on the electric system. That approach worked well while the industry was maturing and costs were declining. But in the 1970s it became apparent that a deeper analysis and more complex treatment of customer loads would reveal interesting opportunities for efficiency. It is now common knowledge that people actually purchase energy services. Recognizing the service-oriented nature of the electricity industry can benefit everyone.

The Energy Services Market

The retail electricity service market functions at the level of the end user of the commodity. In doing so, the market has been competitive since the dawn of the industry. That is, different consumers have made choices about the design of their homes, the types of fuel consumed to make these homes comfortable or to make the tap water hot, the level of protection (electricity quality) needed for delicate electronic equipment, the level of reliability needed for backing up computer data and the particular attributes of appliances and devices. All these devices are part of a fully competitive energy service market. People choose whether to shop at a big box store, call the local contractor or do things themselves. Similar choices hold true for electricity, and as the cost of energy rises, people are realizing they should not be sloppy about their choices.

The term “energy services” covers a variety of functions relating to consumer wants and needs, including services relating to price-risk management, appliance purchase and maintenance, energy usage management, reliability, power quality assurance, direct load control and other value-added services relating to billing and payment or customer convenience. The interaction of the retail market (sale of electricity) and the energy service market is very important. It sparks the emergence of new services and pricing options that will allow consumers to better manage their electricity use and increase the value received.

An understanding of the relationship between wholesaling and retailing is useful. In wholesale markets, consumers receive electric power as a commodity, typically in bulk quantities delivered on a guaranteed or as-available basis to a particular location at a particular time. In retail markets, consumers receive a unique set of bundled energy services. These energy services include the electricity commodity, but there is a distinction between the commodity and the services associated with it. Some may view this as a continuum with “all commodity” and “all service” as extremes, and different combinations of the two constituting the energy bill.

Large consumers typically self-provide the services they need, and therefore spend a larger portion of their total bill on the commodity. Their cost per unit of the commodity is lower. In the extreme, very large consumers have interruptible power service options where the level of reliability is much lower than system reliability. They receive a lower value of service at lower cost in return for providing capacity resources or ancillary services as required by the system operator. Some large consumers own their own transformer and step-down transmission voltage on site, or own power conditioning equipment to customize what they purchase.

Small consumers may differ in their preferences as well. However, under one-size-fits-all regulation, most small consumers have a level of service (reliability, billing and customer care) defined for them by the utility, its regulators and various interest groups.
Unlike the energy commodity market, the energy service market includes substitutes for electricity. More substitutes become economically attractive as the price of electricity rises, and as decisions are made to unbundle services. Unbundling allows consumers to pick and choose according to their preferences.

An appropriate level of unbundling allows all consumers to invest more on their premises—that is, to substitute premises-based services for electricity services. Such investments could be for on-site generation (small power plants), equipment that allows fuel switching as energy prices change, appliances that offer greater efficiency of use, energy storage devices or load monitoring and control equipment. Additional opportunities may arise from third-party suppliers of risk management and aggregation services. In order for consumers to take advantage of such opportunities, regulatory authorities must recognize that the unbundling of services may have a benefit. Each opportunity requires the forging of new utility–customer relationships as customers define what services they prefer to receive from the utility, and what services they wish to acquire in an energy service market.

Examples of energy service options are numerous and varied. In Figure 8, originally developed in 1988, provides a sense of the scope and breadth of energy services that consumers of all sizes might find valuable. The table is for illustrative purposes only. It is not known what specific energy services exist in Alberta or could arise in the future.

The retail energy service market today is complex and diverse. As a competitive retail electricity market evolves, this complexity and diversity will increase. It is not known what types of offerings and services could arise. That’s why it’s important to give inventive entrepreneurs enough space to experiment. Some rules made sense when utilities were the sole providers of electricity services and regulatory authorities focused on maintaining a fair recovery of revenues to monopoly providers. In today’s more dynamic competitive environment, past rules may create barriers to entry.

Consumers are also part of the dynamic. Most consumers will take a wait-and-see approach, while a few pioneers will try out and adapt to new services. Experimentation is a healthy part of creation and innovation in a new competitive market.

**Choices for the Future**

Retail electricity consumers are demanding more choices in the reliability of electric service, in power quality and in the efficiency of electricity usage. Consumers are not yet articulate enough to state, “I must increase my energy efficiency” or “I want to lower the reliability of service to device A to reduce cost.” However, consumers make their voices heard every day as they call for “lower bills” and “better reliability.” Giving consumers tools to manage costs will address their needs and make the electric system more efficient.

Most people understand electric reliability as a constant, so they discuss reliability with regard to the most precious end uses—“my computer during work hours” or “lights on a dark night,” for example. High reliability is necessary for these end uses.

While system reliability is defined by the utility and regulatory authority, reliability at the end-use level could vary, and with greater knowledge and control, individual consumers could make choices with respect to particular end uses. For example, most consumers could withstand several hours of power outage for an electric water heater with storage capacity. They could withstand several minutes of power outage for a refrigerator. However, they could only withstand a few seconds of power outage for...
Consumers demand high reliability for everything on their premises because the system does not allow different end uses to receive different levels of reliability. Cycling electric water heaters off at high-price periods or during system reliability emergencies could lower the reliability of power delivery to a device without significantly affecting the value of service to the consumer who makes that choice. A lower cost to the consumer would be the reward for increased reliability of service for everyone. For such a model to work, customers would have to be compensated for willingness to reduce their draw on the system.

Reliability is just one attribute of electric service that could be subjected to new market opportunities on customers’ premises. Essentially every service, including monopoly service, can be unbundled, and platforms that allow consumers and third-party service providers to participate in a market for these services can be created. Thinking of “competitive electricity markets” as synonymous with “wholesale power transactions” or “retail sale of the commodity” is too limiting. Different end uses can interact with electricity markets in interesting new ways.

Existing wholesale market participants may not be adept at providing retail energy services. They may resist change because they recognize that these services are a substitute for traditional services. Many services provided in wholesale power markets today are overpriced because there is insufficient interaction between demand and supply. Creating new market platforms for the interaction of demand and supply will create more competition.
for energy production, capacity (during emergencies), ancillary services, reliability of delivery and risk management.

The regulation of vertically integrated electric utilities worked reasonably well during a significant portion of the 20th century. However, the traditional assumptions and policies are inconsistent with the emerging service-oriented, customer-driven, energy service market.

Feedback, in the form of price-demand response, would make utilities responsive to customer needs and market pressures, and would lead to more efficient resource allocation. Consumers do not necessarily have a universal desire for distant power plants or for wires that transmit power. Improved pricing would allow price signals and the discipline of markets to control the behaviour of all stakeholders.

**Emerging Services and Technologies**

The promise of vibrant competitive markets is “better services at lower cost.”

Better services and lower costs can occur as new products and services are developed to meet consumers’ needs. In the electricity industry, policy-makers expect that emerging services and new technologies will drive down costs as people use the electric commodity more efficiently. But economic efficiency is much broader than energy efficiency. It refers to a better matching of consumer preferences to resources.

Policy-makers also expect that wholesale power markets will become more robust and competitive as consumers are given opportunities to interact with them more directly. During peak periods, for example, demand response can compete with peaking power plants during the few hours when power plant capacity is in short supply and power prices are very high.

Enhanced customer choice is an important public policy goal apart from any economic benefits and innovations associated with it. Unbundling permits consumers to choose and pay for the services they want, and it allows them to use services that appeal to them and that offered by other supplies. Unbundling gives the power of information and choice to consumers. It leads to more efficient consumption decisions and more efficient resource choice decisions by those who serve consumers.

The process of seeking more efficient solutions requires risk taking, and can occur as part of any market transformation. Risk taking is the key to achieving innovation.

New technologies and new institutional arrangements may lead to new services consumers prefer. Since individual preferences vary, this means some consumers will demand premium-level services, while others will demand basic or low-cost services. This creates inherent efficiencies: diversity in the demand for a product, and complementarities in its use, which can lower costs for everyone. As in other industries, no one can predict who will demand which services, or what technologies will arise to provide new services.

Innovation is the application of new ideas and methods. An entrepreneur can improve the customer experience by applying existing technologies in new and interesting ways. On the customer or demand side of the electricity industry, innovation and entrepreneurship are relatively new concepts, and would represent a significant change. Nonetheless, innovation is the key to achieving “better service at lower cost.”

When people think of innovations, new products—such as Apple’s iPhone—often come to mind. But innovation is not a purely technological phenomenon. In the residential sector of the electricity industry, the need for basic improvements in pricing and information is so great that many new products may not seem particularly innovative. Common sense reforms can address some long-unmet needs. Basic technologies and existing services can be applied in new ways and with new-found freedom, but even common sense changes require risk taking and innovation. Consumers and energy service providers must take this path together. Entrepreneurs cannot get too far ahead of the ability of consumers to adapt and change.

Dramatic innovations with truly innovative techniques are also possible. Innovation has plateaus and some steep advances, and tracking progress may be difficult.

What innovations are likely to occur in the Alberta residential sector? The sky is the limit.

It is important to understand that innovation in energy services has already begun. Restructuring is an innovation made possible by changes in Alberta’s Electric Utility Act. For one segment of residential consumers, understanding that the ability to buy power from someone other than
the incumbent utility is a very valuable change. Some customers would readily pay a premium for that right. Furthermore, the residential electricity market in Alberta has developed a range of consumer options, including weekly billing, paperless accounts, dual fuel contracts and the ability to enter into contracts over the phone or the Internet. Other innovations will be possible when customers have access to new technologies.

Experts on innovations in the residential sector may refer to “smart homes,” “interactive technologies,” “in-home devices” or the “home automation network.” Some of these terms may become relevant in Alberta, and some may not. First, it is necessary to understand that innovation occurs by pulling existing resources together in new ways that better satisfy consumer needs and preferences. Albertans will make choices about what is desired. In the past, the focus was on an electric infrastructure that resulted in “reliable, low-cost power.” Today, the needs are greater, and the infrastructure may become more complex.

Tomorrow’s electric service innovations will leverage public and private infrastructure investments. These include smart meters, usage data portals that enable new offerings, transmission investments to facilitate green power development and advanced telecommunications to help consumers engage with retail energy suppliers and local distribution utilities. Telecommunications in particular will provide new channels for information, control and transactions. No one set of infrastructure investments is required, and not all infrastructure must be provided by the government.

The commercial and industrial energy services market in Alberta is robust, and many innovative products and services have already been developed to address the needs of large consumers. Most large commercial and industrial consumers are highly satisfied with retail choice because they have been able to innovate. Energy price risk management remains extremely important to nearly all commercial and industrial consumers, and retail energy suppliers offer a variety of options to satisfy these varied consumer preferences. Commercial and industrial consumers also have access to a range of on-site services, such as energy services performance contracting, on-site generation and construction services. Each of these services is bundled with the electric commodity to meet the specific consumer needs.

The issue now is whether retail energy suppliers and energy service companies can create a mix of service and commodity that appeals to, and meets the needs of, the residential consumer. The number of suppliers, the range of available products, and the number of unique products and services found in competitive electricity markets are good measures of the current state of innovation. In Alberta, there are a dozen retailers with around 50 unique offerings. There are a few basic products: flow-through of pool prices, fixed-price products, green products and products that bundle electricity with natural gas. In Texas, about 35 suppliers offer 249 products on a state-sponsored shopping website, and other choices on their own websites. In New York, product differentiation is beginning to take off. Between 2010 and 2011, the number of different offerings was up 40%. Consumers could select month-to-month pricing, fixed pricing over periods of two to 60 months, green content of 25%, 50% or 100%, and discount guarantees off the default service pricing option.

In Texas, prepaid electricity service offerings have entered the market, with nine companies offering prepaid products. With the use of advanced meter infrastructure and mobile communications, more energy suppliers are developing prepaid offerings. According to consumer surveys, customers like prepaid options. And the growth in prepaid products confirms the notion that certain aspects of innovation can occur in both the competitive and regulated portions of the electricity industry.
Innovation on or near the residential consumer premises is driven by the following factors:

- high energy prices
- reliability concerns
- access to new providers
  - direct retail access
  - unbundling of monopoly services
  - regulatory reforms to reduce barriers to entry
- investments in infrastructure that facilitate innovation
  - smart grid, including advanced meters
  - transmission and distribution capabilities for power and ancillary service transactions
- increased stakeholder focus on consumer needs
  - green prices
  - new bill payment methods
  - enhanced services and consumer-defined convenience
  - energy-management analytics and additional information on usage
- integration of other industries (natural gas, security systems, communications, cable) with electricity

People who view the electricity industry purely in commodity terms will expect that opportunities for innovation will be purely on the supply side of the electricity meter. The fact is electricity has been sold as a commodity for more than a century, and many great minds have created significant innovations in the production of power and the delivery of electricity.

Today, the situation is changing. Infrastructure advances and the electricity service market are becoming more competitive. Consumers have choices, and service providers must compete to acquire and maintain customers. Even the customers of monopoly utilities have service choices on their premises—solar panels on the roof, more efficient appliances to reduce energy use, new gadgets to monitor usage and discounts for peak reductions. Even monopoly utilities are exploring electricity service value. Utilities and competitive suppliers alike are discovering that most of the potential for innovation is on the customer side of the meter.

Although innovation requires risk taking, it may also lead to new sources of revenue. Consumers with choices often find value in a new service where they previously only received a commodity. Policy-makers must see that a rapid transformation of the electricity industry is occurring. The industry is moving from a focus on bulk power production and delivery (the electric commodity) to new energy services that precisely target and satisfy previously unserved or underserved needs and preferences.

Innovation requires entrepreneurship, risk taking and opportunities for rewards.

A new outlook may reveal barriers to change caused by existing laws, and policy-makers may identify areas for reform. Legislators and regulators may see fit to tighten certain rules and relax others to facilitate innovation and entrepreneurship.

Making the effort is worthwhile.