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## Growth industry: a brief outline of service providers

In several previous papers we have identified various aspects of power supply and distribution that are undergoing fundamental change. The industry is slowly shifting away from the century-old utility system and toward one of increasingly independent generators and service providers. Our coverage focuses primarily on changes in the ranks of power generators as well as the burgeoning role of battery storage. We address financial considerations relevant to all participants; potential new roles for investors; and a long-term outlook for improved transparency via more open, online exchanges for the long-term contracts that are critical to financing new asset development.

Commodity risk management is the common theme throughout these analyses. In particular, we highlight the means by which developers and owners of various assets manage their exposure to power prices and how can other participants absorb that exposure effectively. These considerations will only gain in prominence with additional development of renewable resources – and the requirements among lenders providing the required financing – in the decades ahead.

This paper takes a brief detour from the asset-owner-financier theme and instead provides a very high-level overview of a market segment that has recently gotten more attention from mainstream media and is focused on consumers: the role of energy marketers and service providers. Power generation and marketing are shifting toward unregulated providers (independent power producers) as well as nontraditional sources such as community renewable projects. Commercial and industrial buyers face greater choice in the source of their power as well as in the pricing terms (fixed vs. floating) associated with it. Such flexibility introduces risk factors as well as potential benefits.

The field of service providers is varied. At its widest, it includes a vast collection of independent energy marketers whose main role is to provide competitive wholesale-based pricing for commercial and industrial energy users. These firms basically compete with established providers (utilities) and help lower the cost of delivered power – whether at floating prices or in fixed, long-term contracts.

A narrower field includes firms that go beyond electricity supply to more consultative services, helping customers manage their power demand across far-flung operations. Consumption data collection and analysis is a key growth area, aided by a proliferation of hardware and software systems throughout the grid and within individual firms' operations networks. These providers are helping their customers to make smarter decisions about operations and the fluctuating cost of energy inputs, not to mention choices about the supply of energy from a variety of renewable and legacy sources.

Similar load-data services can also be offered by generators to utilities, effectively putting enhanced information systems in the hands of distributors so that they can provide more useful services to their end-user customers. These tend to be the most sophisticated information systems given the vast reach of utilities and other energy distributors – and all of the data available to them. Such services leverage cloud computing, the growing availability of big data, and internet of things.

Overall, the energy transition favors electric power – all of which is metered – and companies have significant opportunity to improve their understanding of usage across time and space and the variable pricing they face in both dimensions. They will increasingly be in position to make more intelligent decisions about their operations and the corresponding cost of power. This overview is simply an introduction to some of the services that are increasingly at their disposal.

**Evolving roles in power marketing**

Recall that deregulation of the power markets allowed unbundling of the two main components of supply: generation and delivery. As in the telephony market, the companies providing the local connection (whether electric utilities or phone companies) provide the conduit through which households, commercial and industrial customers receive the real service of energy and communication. In the power sector, local utilities may still generate the energy but in many places their customers have a choice and can easily find other providers.

Such providers are often referred to as retail marketers even though much of their clientele may be institutional. They are often affiliated with independent power producers but may also operate without their own generation assets – basically buying wholesale power from other generators and marketing it to households, offices, and industries. In the latter case, their value is in the efficiency in which they buy and sell the bulk product.

As retail marketers have proliferated over the past few decades the energy markets have become much more transparent and competitive, driving down the advantage of those able to offer lower prices. At its simplest, energy marketing is truly a commoditized business that reflects improved efficiency of production, transportation, storage and – especially – transparency of pricing all of the above.

At the same time, energy marketers' ability to offer additional services has improved – primarily from better data availability. They can extract additional value from their client relationships by offering informational services in addition to the energy commodity. They can help commercial and industrial customers to improve efficiency of their operations – both in terms of physical consumption as well as pricing. But they aren't the only ones playing in this space.

**Data is key to everything**

Improvements in data availability are not unique to the power market. Nor are efficiency gains, which are evident in other energy markets – and in commodity markets in general. Consider transportation fuel markets, for example, where trucking fleets have gotten far more efficient in their fuel consumption and pricing just in the past decade by utilizing similar information technologies to sharpen their operations and their purchasing terms.

Nevertheless, power has the distinct advantage of higher frequency of market pricing and, thus, higher value of data collection and analysis. Trucking fleets are still subject to pricing on a daily-average basis – if not weekly or monthly. The same is true for natural gas where consumers typically face monthly index pricing. Industrial consumers may have higher-frequency data on their usage across various locations but if they are paying for their natural gas on a monthly-index basis then any change to their intra-month consumption matters less to their financial performance. They are simply reallocating across a constant pricing scheme.

Power consumers in much of the U.S., by contrast, have the opportunity to analyze consumption on hourly or sub-hourly basis. Companies have access, or can gain access, to huge reams of data to help them understand their intraday consumption patterns and pricing. A proliferation of devices and associated software for analyzing those patterns provide substantial value to those with the motivation to understand it and to use it to make smarter decisions.

The data alone are cheap, or free. Any facility that consumes power has metering capability to capture and store those flows firmwide. Across far-flung operations and within individual facilities there is the potential to utilize devices to further monitor consumption (and production from distributed sources) on a high-frequency basis. Smart metering is available to any enterprise that can benefit from it.

Analysis of the data is the greater challenge, with a wide array of alternatives for energy consumers. For those willing to make the investment in building an in-house capability, data science can provide useful insights to consumption patterns and suggest improvements in efficiency and reliability. The result is better decision-making in energy procurement so that energy suppliers line up mostly on the most transparent of criteria – commodity pricing.

Other firms may not have the budget for such analytical capability but still have an interest in utilizing the data they collect so that they, too, can improve efficiency of operations as well as in negotiating supply contracts. For these companies, external service providers can apply their own capability to analyzing the data and drawing conclusions on improvements to consumption and, perhaps, pricing. We outline below some broad classifications of providers and highlight where they tend to focus their expertise.

**Experience helps: utilities and IPPs**

For all of their reputation as sleepy, uncompetitive electricity providers utilities have a significant advantage in providing services to commercial and industrial customers: reams of historical data. Utilities have knowledge of their customers' past preferences not only for physical power delivery but

also for various pricing schemes (fixed vs. floating indexes). They can share their cache of historical data with customers to help them make more informed decisions about future power demand and pricing.

Except in fully regulated markets, utilities can offer their customers a range of pricing options. They also can do so outside of their home territory via unregulated subsidiaries. Similarly, independent power producers (IPPs) with retail marketing operations offer a similar range of power contracts to customers. These pricing services enable customers to fix a portion – or all – of their expected power cost.

In many cases, the extent of utilities' offerings is limited to pricing options. Others, however, may offer assistance in improved data collection, installing sensors and other devices across operations that are material to their customers' decision-making. Within this group, which tends to be the largest and most active in selling directly to end-users, some have established more significant capabilities in data analysis. Interestingly, it is the large European utilities (e.g. Enel, EDF, Engie) that offer the most advanced analytical services. A quick perusal of their websites provides comprehensive listings.

**Service as an outgrowth of equipment procurement**

Even before deregulation of the power industry in the 1990s, manufacturers of power-supply equipment had unique insight into the flows used by energy consumers. They installed the conduits to handle load and meters to read it continuously. The data they collected had enormous value as markets became deregulated and wholesale markets developed, allowing utilities and large consumers to benefit from more competitive pricing.

Equipment manufacturers understand the value of analyzing the data their systems produce and they have significant capabilities devoted to it. Moreover, while they have typically catered to power generators and distributors (utilities) they are increasingly focused on end-users and are thus competing directly with the most sophisticated products offered by utilities.

Today, those providers are among the largest firms devoted to the industry (e.g. Schneider Electric, GE, Siemens, Emerson, Eaton), spanning the globe with their dual hardware and software integrated services offerings. There are also plenty of new entrants that are focused on providing equipment to the new generation of renewable generators and storage providers, including distributed systems (e.g. SolarEdge). These equipment makers have developed intelligent software to analyze high-frequency flow data and could be material competitors to the more institutional market in time.

Other manufacturers have roots outside the power industry but increasingly see value in offering their products into this competitive arena. Lockheed Martin, for example, offers their engineering expertise to analyzing power consumption, operations, and efficiency, in part via a partnership with PGE. Other engineering firms may be gearing up to compete here as well.

**Data analysis focus**

There is yet another class of service provider that is distinct from the distributors/IPPs and equipment manufacturers described above. This class is more squarely focused on software and utilizing data systems more efficiently across operations. Ultimately, better data systems result in higher efficiencies.

IBM has long been involved in helping commercial and industrial customers improve their knowledge systems, including power usage. Others, including Bidgely for example, have more recently made significant strides. Cloud-based computing is at the heart of each of their efforts and the consequent ability for a wide array of users to pull relevant data and analyze it easily and in real time. This is especially valuable to enterprises' customers, who can improve their own purchasing decision-making with additional resources in hand. Indeed, the main focus of Bidgely is on utilities where the customer experience has been most lacking until now.

**Financial services or other providers?**

Typically, given our focus on commodity price risk management, we identify the banking industry as a provider of various services to the power sector. This includes contract pricing (physical and financial), derivatives trading, and even physical marketing. Banks have long been involved these aspects of the power business, although fewer of them do so today than during earlier phases of the market's development.

In the realm of services, however, banks are largely absent. They may have their own capabilities for managing assets and improving knowledge systems. But they generally do not offer such services to power generators, marketers, and consumers. The field is limited to the general classifications outlined above.

Going forward, there is good reason to expect the field to develop further as companies have additional resources at their disposal to analyze their load and make better decisions about buying it, using it, and, potentially, storing it. We might find additional providers entering from other, more tangential, industries, including more diversified software providers (e.g. Google). Transparency of energy usage will only improve as data generation and analysis proliferates and becomes even more price-competitive, like the commodity itself.