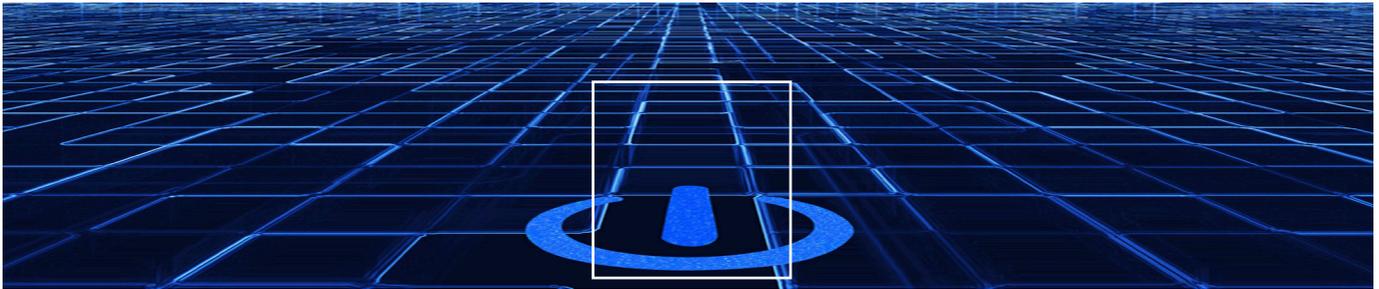


Smart Grid opportunities for telcos

New business models in the electricity market of the future for telcos



Existing electricity grids are not capable of satisfying the increasing demand for a reliable electricity supply in the long run. The growing proportion of decentralized electricity generation based on renewables is making electricity transport and distribution significantly more complex, yet the existing electricity network, which in many cases originates from the middle of the last century, is reaching its capacity and capability limits. A “Smart Grid” – one that links innovative information and communication technologies with traditional electricity components – will deliver intelligent and highly automated grid maintenance and management. New business models and emerging players will change the rules of the game!

Risks and challenges in the electricity network

Existing electricity supply is based on the principle that a large central power producer supplies electricity to the end consumer via a uni-directional power flow. But the rules of the game are changing. Consumers are becoming “prosumers”; not only consuming electricity but also producing electricity on a decentralized basis, in the form of solar power, for example. Thus, the flow of electricity has become bi-directional.

Overall, the electricity market is following a trend from centralized power generation towards decentralized power generation based on renewables, which creates a high level of volatility in the electricity supply. The increasing volatility created by decentralized power generation presents a difficult challenge for the current electricity grid infrastructure and pushes it to its capacity and capability limits. These changes highlight the requirement for an intelligent Smart Grid and gives new players such as telecoms operators the opportunity to enter this highly dynamic environment.

Smart Grid – the answer to increasing risks and growing challenges

To meet the expectations of consumers and overcome the challenges of delivering a modern electricity supply, it is necessary to link the electricity network grid with state-of-the-art information and communication technologies and applications.

Combining the two will create a grid capable of balancing demand and supply effectively – a Smart Grid.

Characteristics of a Smart Grid

In order to meet future requirements, an intelligent network grid needs to have the following capabilities: :

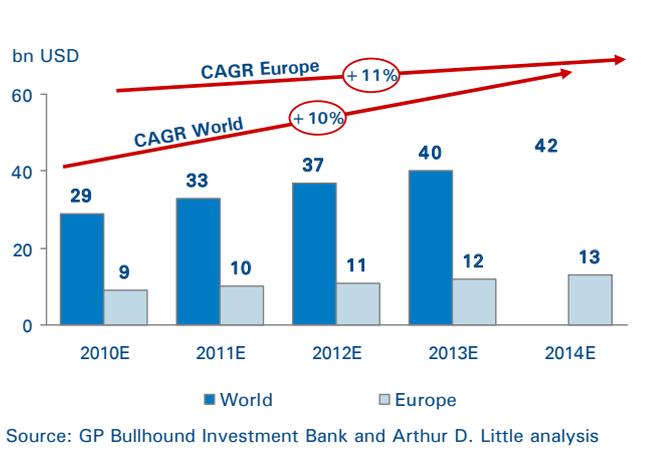
- Integration of growing renewables and decentralized generation
- Forecasting and balancing volatility of production and demand
- Fostering energy efficiency through transparency
- Integration of decentralized electricity storage (e.g. e-Cars)
- Optimization and automation of network management
- Leveraging technologies such as smart metering, virtual power plants etc.

Anticipated Smart Grid market development

The process of transforming the traditional grid into a Smart Grid will be cost intensive. Major investment in the electricity grid infrastructure will be needed if it is to have the capabilities outlined above.

It is predicted that the market for Smart Grid electricity will account for 42 billion USD worldwide and 13 billion USD in Europe in 2014 (see figure 1).

Figure 1: Predicted market for Smart Grid electricity



Telcos have been through significant market changes in recent decades and have learnt to adapt. In a saturated market, they are now starting to move from mass-market products to more sophisticated and vertically integrated solutions as a means of addressing declining revenues in the residential telecoms market. However, their existing core competencies seem almost predestined for expansion into certain areas of Smart Grid, allowing them to gain a foothold in the electricity market.

The existing automated meter reading business has not tempted telcos, since the low level of data traffic on SIM-enabled meters makes average revenue per user (ARPU) unattractive. To address this, the fundamental business model for automated meter reading needs to be broadened to include billing and management services for the energy market and the end-customer.

Moving from a connectivity-oriented business, which represents only 10–15% of the value generated in this field, to a service provision model would allow operators to extend their share in the value chain up to 60–70%.

As telecoms operators are currently developing their skill sets and platforms, it seems it will be only a matter of time before they move en masse into this highly attractive area.

Selected business opportunities for telcos

Arthur D. Little has analyzed a range of business models in the context of Smart Grid and evaluated their attractiveness and feasibility for telcos.

Figure 2 shows a small selection of the business models analyzed while two business models are explored in detail below:

1) Next Generation Billing

The overall electricity billing market is about to change in several ways, with new regulations acting as a catalyst and accelerating change. Generally, the billing market will develop in three key dimensions:

- Billing data quantity will increase substantially as it approaches real-time data frequency
- Billing will become more sophisticated due to new tariff systems e.g. load-based tariffs
- Billing will grow in complexity due to electricity mobility which will trigger electricity roaming

Until recently, the billing market for household electricity was characterized by annual, manual metering of electricity consumption. With the new generation of online Smart Meters measuring consumption minute by minute, the quantity of pure data will increase 500.000-fold.

In addition to the increase in data, the market anticipates a sophistication of the billing process, with tariff structures moving from flat towards time- and load-based tariffs (also known as individualized tariffs). As a result, the billing process needs to become intelligent enough to differentiate electricity consumption in accordance with diverse tariff structures, including tariff structures that change in real time.

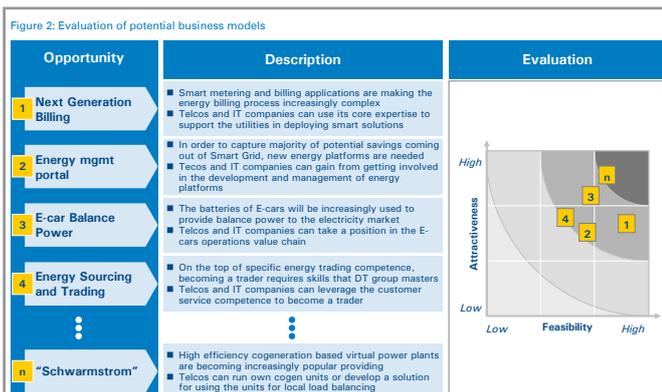
The process of sophistication is linked to increased complexity in the billing process, however electricity mobility, which will inevitably lead to some sort of electricity roaming, is also expected to be one of the key drivers of complexity.

These trends and the changes they will bring about form an ideal opportunity for telcos to move into the electricity billing market. Importantly, telcoms enterprises possess expertise in complex billing as well as the infrastructure to deliver this, while utilities do not yet have the infrastructure nor the business processes to meet the changing requirements for billing and metering. Telcos are in a position to present themselves as service providers or could even start to compete with utilities and metering service providers.

Market attractiveness

The electricity billing market is expected to grow due to the greater sophistication of billing services. Moreover, from

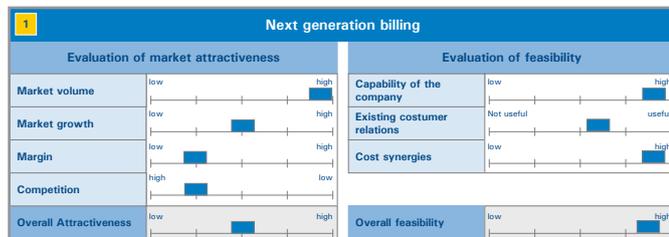
Figure 2: Evaluation of potential business models



January 1, 2010 all new buildings in Germany need to be equipped with smart meters. However, high competition among telcos, which all have the capabilities required to deliver metering services, is expected to produce relatively low margins in this market.

Feasibility

In CRM and billing, there are many similarities between telcos and utilities, particularly when smart meters and flexible tariffs are taken into account. Moreover, existing customer relations can be exploited as a sales channel, and bundling electricity metering with other telco products would be feasible (e.g. home or office automation, remote-management-over-mobile devices etc.). However, telcos would need to develop competencies in grid connection, utilities tariffs etc.



2) Energy management portal

The anticipated modernization of transmission and distribution grids means consumers will be much more involved in their energy consumption decisions and consequently have more control over their final energy bills. Generally, this will be enabled through three major drivers:

- Deployment of real-time pricing offering various energy price levels based on the particular base load
- Implementation of new technologies enabling online remote control of consumers' entire appliance portfolio
- Availability of consumer behaviour analysis enabling adjustment of future consumption

Before the Smart Grid concept was born, consumers who wanted to save on energy bills had no options other than to limit use of their in-home devices. Thanks to the recent implementation of smart technologies, consumers will have other options for decreasing their energy budget and for contributing to more stability in the grid. Among these options are:

- Demand response to various price signals whether to produce or consume energy at any given time
- Home Area Network connecting various smart devices that consume energy according to their default set-up or particular instruction by the end-user

To become smarter energy consumers, customers will need constant access to information about the situation at any given

moment. Currently, this is available through a number of energy portals built by both top-tier and boutique telecommunication or IT companies. Tools such as Google's PowerMeter and Microsoft's Hohm and dozens of other portals are undergoing constant development in order to fulfil customers' needs.

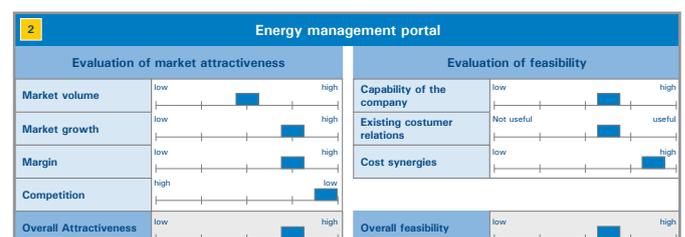
Energy management portals as they are today are not only demand-side management tools; they also contain integrated features such as targeted search, social integration and many others. Their ambition goes further: today's portals are offering a growing range of tools and services for their users and seem to have both the aspiration and the potential to become a new generation of platforms.

Just as Facebook, Twitter, LinkedIn and other social networks form an integral part of people's daily routine, future energy platforms could become a connecting point for a great number of other services. Currently, telcos have not found a significant inroad into the social network arena – they merely serve as a connectivity provider for social networking applications. With Smart Grid services, telcos would have the chance to address this market much more efficiently, generating revenues from both application providers (e.g. provisioning of data) and customers (e.g. allowing a certain quality of service) in a single business.

Market attractiveness

Recently, energy management portals have caught the eye of many investors and have made it onto the hot list of businesses being watched by the M&A sector. What makes the energy management portals particularly interesting to investors is that the operators will gain a detailed insight into how consumers behave, which will create huge potential for marketing products and services of all kinds. There are roughly 200 million households in the EU alone.

Telcos face an interesting business opportunity: they will become one of the few players able to gain access to a share of the entire energy management market. Their ability to utilize their existing network infrastructure and enabling capabilities to manage critical applications much more effectively will be a strong point of differentiation compared to application providers without their own network infrastructure.



Feasibility

Operating an energy management portal would not present a particularly complex challenge for telcos in terms of the infrastructure required and data handled. Existing telecommunications customer portals could even be developed and expanded to include energy management functions.

Telcos should prepare carefully

The increasing interconnection of the traditional grid infrastructure and information and communication technologies is generating significant market changes and triggering the development of new business models. This translates into a great opportunity for established as well as emerging players to develop new business models and thus expand their business beyond its current horizon.

However, while the changes present opportunities, traditional electricity market players also face the risk of losing market share to new and emerging players, particularly if Smart Grid becomes a key market for telcos in future.

For telcos, Smart Grid is an opportunity to expand their business into the power market and become an established player in the electricity value chain. Telcos should analyze the whole set of potential business models (from limited connectivity services to full electricity management services) to identify the most promising options for generating margins on a long-term basis.

The greatest challenge for telcos is to formulate a robust strategy and appropriate processes that allow them to act quickly and flexibly in response to the changing economic, technological and regulatory environment. This challenge is particularly difficult since the structure of the Smart Grid market is much more complex than that of telcos' current core market. Telcos need to prepare carefully since their strategy will have to support the ultimate objective of identifying business models that are sustainable/profitable and deliver a competitive advantage.

Arthur D. Little's "Future Grid Strategy Kit" encompasses the two dimensions that will inform strategy decisions: competitive advantage and market attractiveness. The kit allows telcos to make a systematic analysis of both the potential profitability of a business model and the feasibility and competitive advantage of the underlying company. Thus, the Future Grid Strategy Kit coupled with Arthur D. Little's energy and ICT expertise is the foundation for sound and successful preparation for an entry into the electricity market of the future.

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