

SMART ENERGY FOCUS: CUSTOMER, MARKET AND UTILITY

The electric power industry is shifting from centralised generation toward a more decentralised grid. New technology and business models are being developed to support this fundamental shift, opening the window for a new era of 'energy cloud' and 'energy as a service' solutions. This is happening due to the realisation of smart energy in customers' energy portfolios by applying new products and technology solutions. The great use of technologies by utilities has been responsible for breakthrough and transformation of the classical energy sector into the smart energy sector: smart

grid, smart metering, demand response, home automation, home area networks, distributed renewable resources, plug-in (hybrid) electric vehicles, along with advanced distribution information systems, have been made possible in this transformation. However, the evolution of the technologies in the utility requires alignment with the market and the customer to become smart – taking into consideration that the Utility, the Market and the Customer are essential components of the Smart City.

Smartness within three key components of the city can make this alignment possible:

smart customers, smart markets and smart utilities.

Smart energy is envisioned through the above three components and the role that smart utilities should play in promoting smart markets and smart customers.

Smart customer:

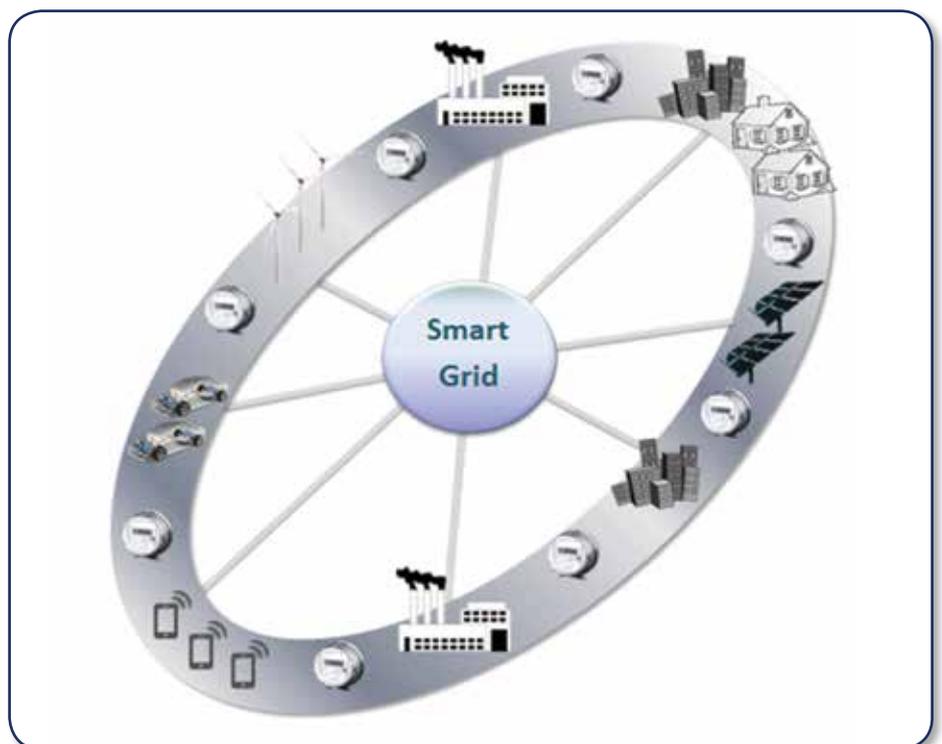
A 'smart customer' is an empowered customer, able to make decisions about its energy usage, maximising energy value. A smart customer looks for the implementation of energy efficiency measures to optimize energy use, lower cost, and decrease their carbon footprint. Unfortunately, customers implementing energy efficiency are driven by market offerings which are product oriented. Different market players focus on specific areas of energy use that satisfy their product offerings. This results in a non-rational investment without reaching the smart customer goal of optimal energy use.

To support the customers in their evolution towards smartness, utilities should provide the proper technology foundation by the implementation of smart grid components.

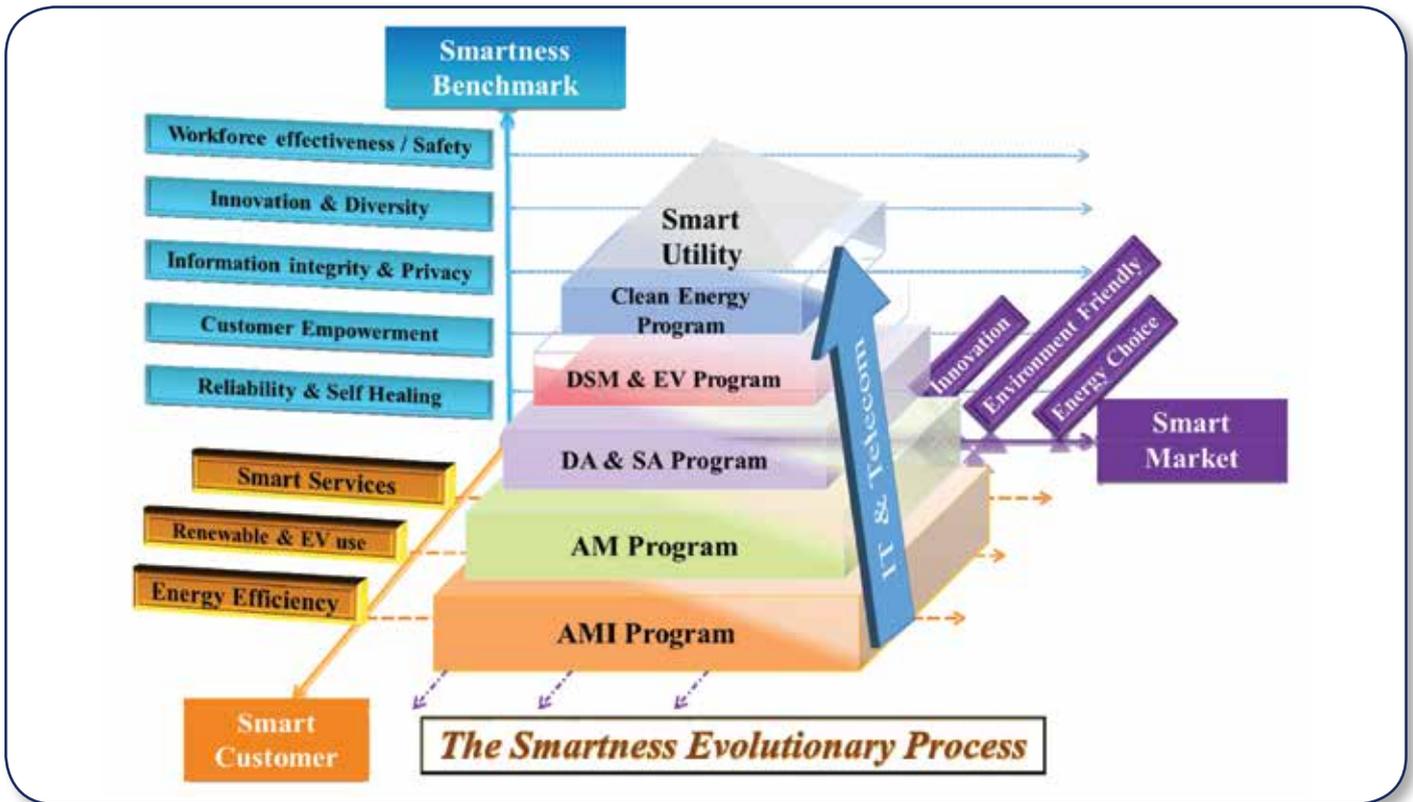
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These energy products and technologies will empower customers to rationalise their use

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Smart grid: foundation of future smart utilities



of energy and use it smartly in their journey towards smart energy realisation.

Smart market

Today's markets are focused on selling products to increase the sales margin with minimal attention to smart customer needs. However, in the increasing implementation of energy efficiency and smart grids, the existing markets will change, answering smart customer needs to maximize the value of their energy. Accordingly, markets for energy efficiency and renewable energy will grow without imposing adverse impacts on customers, providing the equipment and the technology that will support the customer to benefit from energy advancements.

A 'smart market' will emerge to enhance customer service and to provide customers with greater energy service choices, control and convenience, under the vision of an innovative, connected and sustainable energy future. The smart market will be flexible to allow customers to choose alternative energy management and information services.

Smart utility

Utility transition towards smartness relies on several aspects: its strategy, customer and market.

Utility strategy depends on critical programme developments which are interlinked and sometimes inherited. These are an 'innovation programme' and a 'smart

grid programme'. The development of an 'innovation programme' should describe the overall approach to embrace and develop new techniques for the benefit of the stakeholders; the 'smart grid programme' implements the new technologies to develop smart energy. The consideration of implementing advanced tools is necessary to create a self-healing and resilient system, through the use of real-time information to more efficiently utilise the utility distribution and transmission assets, and communication and remotely controllable field devices.

The two other smartness aspects affecting the smart utility are the customer and the market.

From one side, the utility should create the foundation for an innovative, connected, secured and sustainable energy future to push its customers to increasingly adopt the components of smart energy, use automated energy management systems, install distributed energy resources and utilise renewable and storage energy capabilities.

On the other side, it should promote smart markets by enabling, facilitating, and creating

reliable transparent information services that are valued by customers and market participants.

It will enable standard, consistent protocols across markets to provide secure transactions and protect customer information.

'Energy smartness' transforms cities to become sustainable and innovative, relying strongly on achieving smartness in the components of smart cities. This vision will result in the flexibility to accommodate future expansions, the connection of renewable energy resources to the grid and the introduction of new techniques, in a secure environment. However, this should be controlled by introducing a set of smartness indicators (SI) that will be centered on the smart city vision and respectively, the smart energy deployment plan. It is time to rationalise the traditional KPIs to encourage intelligence, accelerate technology adoption into the new model of smart energy. As a result, it will be possible, in the future, to identify, quantify, and monetise associated cost and benefit estimates for all of the components of smartness. ■



ABOUT THE AUTHOR

Khalil Tarhini is general manager for NEEDS SA. He holds an ME degree in EPE from AUB and has 22 years of regional experience in power systems operation, planning, development and implementation of advanced technologies.

He is involved in managing projects with a total portfolio of \$3 billion and is an active consultant in energy conservation, power systems analysis, DMS, distribution automation, AMI, DSM, and smart grid.

Tarhini is the co-author of several publications in power systems and of the *International White Book of Grid Integration*.