Leading the Way to Smarter Grids: 4G WiMAX for smart grid communications

By Ashish Sharma, Alvarion Ltd.

Imagine having the ability to unify all the communications needs for the smart grid via a single communication – be it distribution automation, concentrators, video surveillance, smart metering, mobile workforce, etc. – through a future-proof 4G technology. Bringing such capability for a grid that is relying on outdated technologies will empower the utilities with the communication networks they need now and in the future.

Though initially targeted for operators and WISPs, 4G WiMAX has emerged as a leading alternative for vertical market applications especially smart grid. The fundamental technological advantages of WiMAX – superior radio technology, built in QoS and security, and an open IP-based access network infrastructure – are making it the technology of choice for real time smart grid applications.

WIMAX is Here, Now

The technology has already enabled more than 550 networks around the world in over 130 countries. With a vibrant ecosystem, WiMAX is poised to play a major role in the future broadband market. For utilities, 4G WiMAX provides a flexible network architecture as it operates on multiple frequency bands and Alvarion is the only vendor that provides an integrated WiMAX 16e system that can work with multiple licensed and licensed-exempt frequencies. Such capabilities give the utilities the options they need to deploy a successful smart grid communications network.

An all-IP end-to-end network built using WiMAX can allow the utilities to enable multiple types of services such as renewable generation management and control, substation automation, field operations communications, distribution network monitoring and control, residential broadband and smart metering. Most importantly, it will allow them the capability to scale the network as they expand their services.

Adoption of WiMAX for smart grid networks The adoption of WiMAX infrastructure for smart grid use is gaining traction.

In the U.S., separate WiMAX spectrum has not been allocated to utilities yet and therefore the main WiMAX deployments and pilots are in 3.65 GHz, a quasi-licensed spectrum that can be acquired at a very low cost but presents exclusion zones, or areas within the utility service territory where 3.65 GHz cannot be used due to earth stations.

Another option can be the utilization of Alvarion's WiMAX 802.16e product in the 5 GHz licensed-exempt frequency bands, allowing utility companies to deploy a full WiMAX solution using 3.65 GHz across their service territory and 5 GHz within the exclusion zones.

Due to the dedicated allocation of the 1.8 GHz spectrum to utilities, it is anticipated that Canada will fully adopt WiMAX for smart grid networks. WiMAX adoption is increasing as a solution for smart grid connectivity with some utilities in Europe at the 3.5 GHz frequency band.

WiMAX is Already Creating a Smarter Grid

Companies like Israel Electric Corp (IEC) and others in the U.S. have deployed products such as Alvarion's BreezeMAX® and BreezeMAX Extreme to create a smarter grid. IEC's vast fiber network covers a large part of the Israeli electric grid and was looking to cover remote locations, which required a huge investment. They needed a solution that would enable connectivity to all remote sites including last mile connections from the fiber network end point and a large coverage area. IEC sought a standard, off-the-shelf, long term solution that would meet current and future needs.

The utility's communication team chose BreezeMAX to deliver the wireless broadband connectivity needed for this project. The proof-of-concept tested pre-defined communicatinos, security and emergency scenarios enabling remote data and video transmission, analog and VoIP calls over the wireless network and mobile connectivity to demonstrate enablement of a mobile work force and proof of cellular coverage.

WiMAX as the answer for tomorrow's smart grid As the first 4G technology commercially available in the market, WiMAX provides the smart broadband infrastructure that smart grids need to prepare for tomorrow's demand. Utilities see WiMAX as the solution for parts of their network where there is a demand for applications such as collecting large amounts of data on voltage, current, frequency and two-way communications in real time.

The future of the smart grid network rests in today's planning; WiMAX guarantees a future-proof infrastructure that grows with the demand. Utility usage is only expected to grow exponentially year by year and utility companies need to be sure

they can provide a reliable service. Coverage and capacity is key while ensuring QoS – and WiMAX's rapid ROI and expansive infrastructure provides a good fit.

A future proof choice, WiMAX ensures communications for the smart grid of today and tomorrow.

Ashish Sharma is VP of Marketing for Alvarion Ltd. Ashish is very active within the WiMAX industry, playing a prominent role within the WiMAX Forum Marketing Working Group. He was instrumental in the development of the WiMAX industry during its infancy, and has continued to contribute to its growth by leading key activities with Alvarion and the WiMAX Forum.

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