

# VAN Use Case for Process Automation

by Dr.-Ing. Axel Klostermeyer  
Siemens A&D SC IC P

For several decades now fossil sources have been helping us to enjoy a comfortable situation that could not always be taken for granted during the history of man and which even nowadays cannot be assumed to be a common good in all countries all over the world.

In the future the situation will change; due to their CO<sub>2</sub> production, fossil energy sources are understood to increase global warming and, as a result, seem to change our climate dramatically. Moreover, black coal, brown coal, turf, oil and gas will be more and more expensive in the future as more and more people expect to cover their demand.

Against this background, renewable energy sources come to the fore and tend to be used more and more commonly: photo-voltaic systems, biomass power and fuel generation, small wind power plants, as well as wind parks nowadays significantly support the power production. In this context, not only the source of energy changes, but the character of the corresponding power plants is also quite different. Many renewable energy generators are much smaller generation units than modern fossil power plants and they are often widely distributed all over the country, e.g. a 1GW power plant must be replaced by 100.000 10kW photo-voltaic systems on top of a house.

But how to control the huge amount of small power generation units and care for load balancing issues?

Big power plants and their power transmission lines have dedicated control and communication mechanisms, but small units cannot afford such an effort. Monitoring, control, automation, and protection within a park of distributed power generators and consumers, using an appropriate and flexible communication infrastructure, is one of the future challenges in this picture. Since a short time ago the term "smart power grid" is being used to describe a corresponding set up. A smart power grid may best be defined as using communications and modern computing to upgrade the current electric power grid, so that it can operate more efficiently, reliably and safely. Such an upgrade is equivalent to bringing the power of the Internet to the transmission, distribution and use of electricity - it will save consumers money and reduce CO<sub>2</sub> emissions.

Against this background VAN is developing a universal networking solution able to link worldwide components in process and factory automation from the single sensor in one factory plant to remote machinery in de-centralized enterprises/sites. VAN's interoperable communication can be realized via fieldbuses, office networks and even the public communication infrastructure - wired or wireless.

The integration of VAN with the power grid in order to create an electricity-communications superhighway capable of monitoring its own health at all times, alerting officials immediately when problems arise and automatically taking corrective actions enable the grid to fail gracefully and prevent a local failure from cascading out of control.