

SMART MONITORING – SMART PLANNING – SMART CONTROL
ACTIVE GRIDS TO INTEGRATE PERIPHERAL SUPPLIERS

■ As renewable sources of energy are tapped more widely, electricity generation becomes increasingly decentralized – and this imposes entirely new demands on grids. Building on preliminary scientific work and on the rollout of smart meters, the long-term aim is to develop innovative ways of integrating peripheral generating facilities such as photovoltaic systems or wind farms, in both medium-voltage and low-voltage grids. With conventional technology in place, coping with distributed generation on a large scale involves a great deal of expenditure. Innovative planning strategies, appropriate technologies and stable business models for smart planning, smart monitoring and smart control make solutions with much better cost/benefit ratios possible.

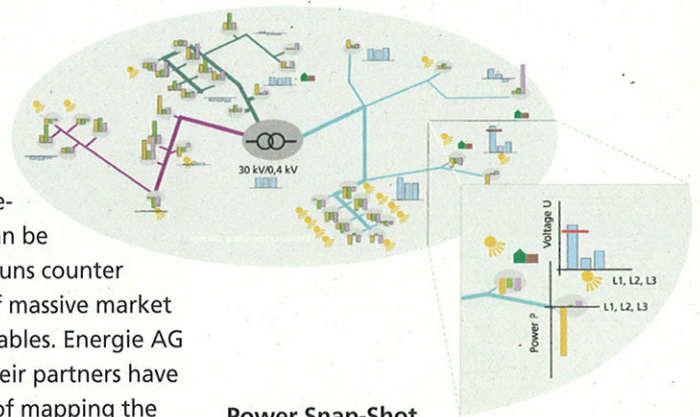
Eyes in the grid –

ISOLVES: PSSA-M (Power Snap-Shot Analysis by Meters)

The existing low-voltage grid is not designed to accommodate feeding in significant amounts of electricity from peripheral generating facilities such as photovoltaic systems. As things stand, the operative decisions this requires still have to be based on individual calculations and on estimating load peaks in individual segments of the grid. To ensure that the voltage stays within defined limits, ample safety

margins are added – severely restricting the number of additional distributed generating facilities that can be accommodated, which runs counter to the political goal of massive market penetration by renewables. Energie AG Oberösterreich and their partners have developed a method of mapping the actual voltages and demand levels in

low-voltage grids in town and country: “Power Snap-Shot Analysis by Meters”. Smart meters provide the necessary data. Data gathered in roughly 100 representative local grids are used to characterize the state of the grid and construct appropriate grid models; this makes it possible to improve grid planning and grid operation significantly, and to develop support tools for operation.



Power Snap-Shot by Meters

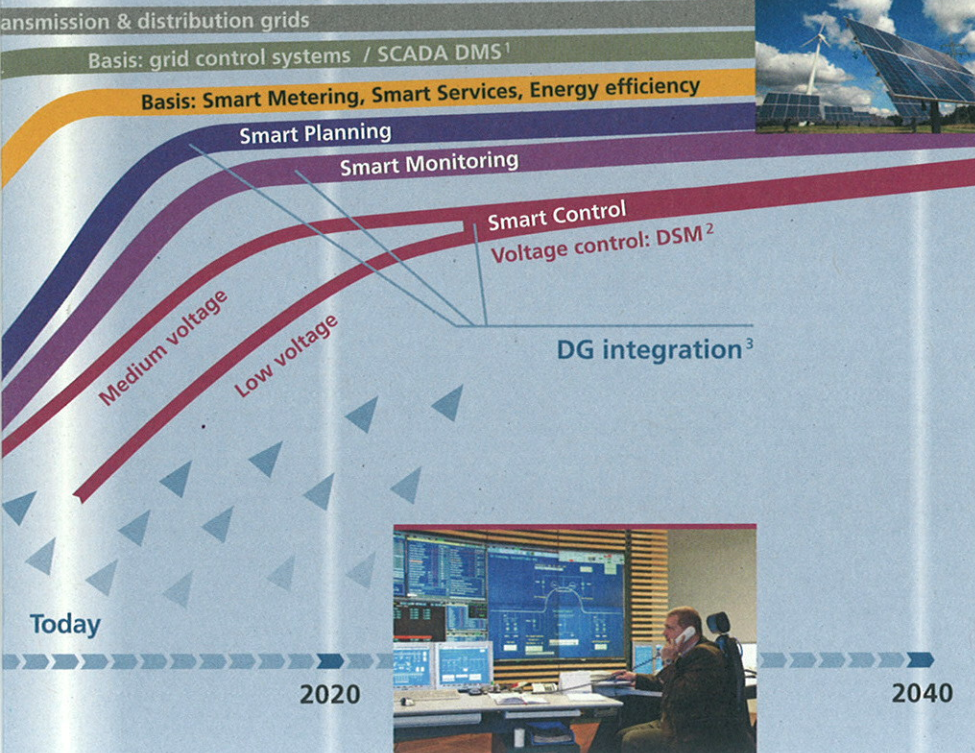


- 1 SCADA DMS: Supervisory Control And Data Acquisition Distribution Management System
- 2 DSM: Demand Side Management
- 3 DG: Distributed Generation



Information flows in electrical energy system – IRON Concept

To date there is little or no communication with consumers or small suppliers in the power grid. Project IRON (LINZ AG and partners) explored market-oriented ways of utilizing efficiency-boosting potential that has not yet been tapped. The focus was largely on load management, in which the main concern is with rescheduling loads over time. Both consumers and suppliers can be influenced only if a communications infrastructure based on smart metering is in place. The technical models looked into will be evaluated in follow-up projects, mainly in terms of their economic aspects.



Source: Energie AG Oberösterreich