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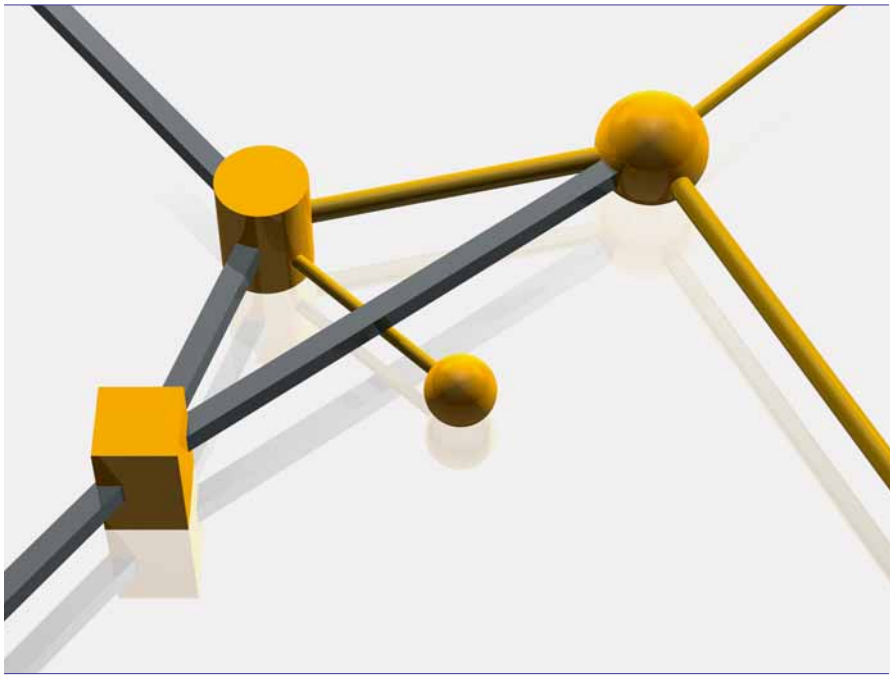

Smart grids

Typical power grids feature large power plants delivering power to consumers in their extended area. Power flows are predominantly one-way and supply is tailored to follow demand. The fundamentals of this model have remained basically unchanged since the early days of power transmission.

Changing conditions are calling for a rethink of this approach. One of the factors influencing this is the rise of renewable energy fueled both by environmental awareness and concerns over carbon dependency. A challenge of the large-scale integration of wind and solar energy into grids is that their supply is intermittent and difficult to predict. Furthermore, their generation is often in locations that are far from the major load centers and where the grid is traditionally weak.

A further factor affecting future transmission networks is liberalization, which is leading to increased power trading and consumers being able to choose the source of their power – placing additional pressure on transmission networks.

The grid of the future must be able to handle increased long-distance power flows safely and reliably. This calls for technologies that can enhance grid capacity and stability. There will be a move away from centralized power sourcing and one-way flows to more distributed generation and two-way flows. The increased complexity of controlling such a grid calls for advanced monitoring equipment along with the associated control strategies.

ABB has the technologies, products, services and strategies to respond to these demands. These will be the focus of issue 1/2010 of *ABB Review*.