



If ABB were to be given a “genetic fingerprint”, it would consist of a DNA molecule where the two strands are represented by productivity, and grid reliability and flexibility. The cross bars linking these strands would then represent energy efficient products and services.

This symbolism suggests that innovation is necessary to propel the ABB group forward as long as it is focused on the strategic principles that result in enhanced customer benefits.



Innovation – the DNA of business

Economic growth and rising standards of living in many parts of the world are contributing to the continuous surge in demand for electricity around the globe. In particular, in fast-developing countries with comparatively weak electrical networks, increasing private and industrial consumption can rapidly decrease reserve margins, thereby threatening grid reliability. To try and prevent this from happening, countries such as China, India, Brazil and South Africa are all planning long-distance electrical bulk transmission.

At the same time however, many mature markets with an aging infrastructure often lack incentives for investment. This not only leads to continuing deterioration, but also to shrinking reserve margins in networks that are operating close to their capacity limits. Under such conditions, otherwise harmless disturbances can trigger wide-area rolling black-outs. To cope with these problems, major investments are necessary. In fact, an International Energy Agency (IEA) forecast for electricity generation, transmission and distribution between 2001 and 2030 puts the figure at \$9.5 trillion!

On the power generation side, most forecasters expect demand to be satisfied predominantly from primary resources, subject to growing cost and environmental concern. To face the world's energy challenges, the most modern and energy-efficient products and solutions, compatible with environmental and regulatory legislation, must be used on both the demand and supply sides, and in the grids that connect them. On the demand side, improvements in productivity and energy efficiency are high on the industrial agenda. The Kyoto protocol – and the trading schemes associated with it – create incentives for change. Much of the technology needed to considerably improve energy efficiency in industry is already available, even though not fully utilized.

In the more mature markets, renewable and distributed generation is increasingly becoming the focus of new investments. However, grids that are built and fed from a few large and steady central bulk generators are not always appropriate for handling distributed and fluctuating supplies. Substantial improvements will be needed to adapt today's infrastructure to tomorrow's requirements.

These market developments are an essential input and driving force behind much of ABB's research and development, where we aim at improving energy efficiency and productivity for our industrial and utility customers.

This issue of ABB Review strongly reflects this ambition, describing what we consider are ABB's best technical innovations during 2005, and exemplifying a choice of innovative customer solutions.

A selection of these innovations, spanning a range of application areas in the chain from electricity generation, AC and DC bulk transmission, distribution, and utilization is reviewed in greater detail. Grid flexibility and grid reliability are addressed and exemplified by underground HVDC Light® transmission and the newest generation of Flexible AC Transmission systems (FACTS) and phase shifters for load flow control. Even in environmentally sensitive or otherwise constrained areas, where conventional extensions to existing infrastructure is not possible or appropriate, these new solutions provide options for integration into the existing infrastructure. In addition, we look at the technology for a recently introduced new family of medium-voltage breakers.

Articles on the demand side cover productivity and energy efficiency, main drivers of our industrial strategy. Productivity improvements are featured in a copper industry application. Capital productivity is increased by gradually integrating older control systems and migrating them towards ABB's extended automation system. Automatic and advanced loop tuning eliminate a long-standing issue of deteriorating system performance over time.

With regard to energy efficiency, we shine a spotlight on low-voltage switchgear. A galvanizing line application describes an innovative stabilizer technology that enhances product quality and indirectly reduces energy requirements.

We conclude this issue with the second part of our innovative wireless technologies story and the third and final article on security in automation systems.

Just like DNA is at the root of all cellular forms of life, innovation is the basis for sustained success in business.

Enjoy your reading.

Peter Terwiesch
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ABB Ltd.