



The light bulb is a symbol, if not the archetype of innovation. Artificial light has given mankind unprecedented flexibility in the scheduling of activities, and hence permitted huge breakthroughs ranging from personal freedom to industrial productivity. Electric light is possibly even the most visible man-made artifact when the Earth is viewed from Space.

Not all innovations must change the world in such a profound manner, but they do advance the cutting edge of technology in their own specific areas. This issue of *ABB Review*, Fruits of innovation, celebrates the brightest of the breakthroughs of 2008.



A silent evolution

Global society is rallying together to try to mitigate a number of major challenges currently facing mankind. The most prominent of these challenges are the rapid decline of fresh water resources, shortages of primary energy reserves and the negative consequences of global warming.

The media highlights these challenges, arguing that a dramatic change in people's attitude is required and new technology breakthroughs must be made immediately to solve the problems. A revolutionary change in technology, however, is not always necessary. Frequently, the most effective solutions are made by adapting existing technologies so that they evolve to solve new problems. Since these technologies already exist, they are rarely recognized by the media as groundbreaking, yet they can be very effective. Innovations in industry have been evolving quietly, receiving very little media attention, yet the technology to help mitigate the challenges we face today are to a large extent already available. By taking existing technology and applying it to solve new problems, huge time-consuming leaps in technology development are not required. Small innovative steps frequently lead to the rapid development of solutions without attracting media attention.

Take, for example, the huge potential for energy savings that could be made in buildings, private houses, office suites and factories. By taking existing technologies and applying them to new problems and making small innovative breakthroughs, ABB has developed a user-friendly control system, called "Living Space," to manage the energy used to operate a building efficiently.

ABB can now connect huge wind farms far out to sea to onshore grids through subsea DC cables at high voltage, and can connect hydropower plants to grids across inter-

national boundaries, such as from Norway to the Netherlands. These innovations have made it possible to exploit remote renewable energy resources that would otherwise have been out of reach.

Feeding the energy-hungry mega-cities of China's east coast with power generated thousands of kilometers away in the west has required a step up to ultra-high voltages above 1 MV. This step was required to significantly reduce the transmission losses that would be incurred using conventional approaches. New challenges in switchgear technology, well proven in millions of lower-voltage level installations, was made to cope with these new ultra-high voltage levels. ABB is proud to have made this evolutionary step and demonstrate the world's first 1,100 kV gas-insulated switchgear in China.

The capabilities of robots are also evolving: The ABB Flex-Picker, the robot that was already able to sort small pieces in a production line at high speed, can now, in its second generation, perform 130 operations per minute, moving loads in the kilogram range to new locations with a precision of less than a millimeter at acceleration speeds of more than 10G.

These are only a few examples of the silent evolutionary changes that ABB has promoted. ABB will continue to improve technologies and develop new applications, providing a foundation for solutions to the challenges that lie ahead.

In this issue of *ABB Review*, we want to share with you some of our evolving technologies. The fruits of our annual investment of more than \$1 billion in research and development are harvested by our customers, adding up to a rich table of improvements for society at large.

Enjoy your reading.

Peter Terwiesch
Chief Technology Officer
ABB Ltd.