



The cogwheel is often used to symbolize productivity. Interlocked with other geared components, the wheels interact to advance the mechanism.

At ABB, productivity is the result of a multitude of innovations made by its dedicated work force, advancing ABB's offerings to provide efficient customer solutions. This issue of *ABB Review* takes a closer look at some of these "Elements of productivity."



The quest for the optimum

Throughout the history of industry, there has been one factor that has spurred on progress more than any other. That factor is productivity. From the invention of the first pump to advanced computer-based optimization methods, the key to the success of new ideas was that they permitted more to be achieved with less. This meant that consumers could, over time and measured in real terms, afford to buy more with less money. Luxuries restricted to a tiny minority not much more than a generation ago are now available to almost everybody in developed countries, with many developing countries rapidly catching up.

With industry and consumers expecting the trend towards higher productivity to continue, engineering companies are faced with the challenge of identifying and realizing further optimization potential. The solution often lies in taking a step back and looking at the bigger picture. Rather than optimizing every step individually, many modern optimization techniques look at a process as a whole, and sometimes even beyond it. They can, for example, take into account factors such as the volatility of fuel quality and price, the performance of maintenance and service practices or even improved data tracking and handling. All this would not be possible without the advanced processing capability of modern computer and control systems, able to handle numerous variables over large domains, and so solve optimization problems that would otherwise remain intractable.

Whether through a stunning example of how to improve the rolling of metal, or in a more general overview of progress in optimization algorithms, this edition of *ABB Review* brings you closer to the challenges and successes of real-world computer-based optimization tasks. But it is not in optimization and solving alone that information technology is making a difference: Who would have thought 10 years ago, that a technician would today be able to diagnose

equipment and advise on maintenance without even visiting the factory? ABB's Remote Service makes this possible. In another article, *ABB Review* shows how the company is reducing paperwork while at the same time leveraging quality control through the computer-based tracking of production. And if you believed that so-called "Internet communities" were just about fun, you will be surprised to read how a spin-off of this idea is already leveraging production efficiency in real terms. Devices are able to form "social networks" and so facilitate maintenance.

This edition of *ABB Review* also features several stories of service and consulting successes, demonstrating how ABB's expertise has helped customers achieve higher levels of productivity. In a more fundamental look at the question of what reliability is really about, a thought-provoking analysis sets out to find the definition of that term that makes the greatest difference to overall production.

Robots have often been called "the extended arm of man." They are continuously advancing productivity by meeting ever-tightening demands on precision and efficiency. This edition of *ABB Review* dedicates two articles to robots.

Further technological breakthroughs discussed in this issue look at how ABB is keeping water clean or enabling gas to be shipped more efficiently.

The publication of this edition of *ABB Review* is timed to coincide with ABB Automation and Power World 2009, one of the company's greatest customer events. Readers visiting this event will doubtlessly recognize many technologies and products that have been covered in this and recent editions of the journal. Among the new products ABB is launching at the event is a caliper permitting the flatness of paper to be measured optically. We are proud to carry a report on this product on the very day of its launch.

Enjoy your reading.

Peter Terwiesch
Chief Technology Officer
ABB Ltd.