

# Innovating for customers around the world

President's Letter, ABB Technology Report

**A**mong the hardest – and therefore most stimulating – challenges for business is devising the right responses to fundamental shifts in the business environment – not only what to change in the company's strategy, business portfolio or organizational model, but also how to implement the change.

Our new, customer-oriented organization, is a response to what we call the silent revolution. In a nutshell, the silent revolution is the combined impact of globalization, deregulation, privatization, industry consolidation, new information technologies – and more. In other words, more and faster change.

We asked ourselves how we should change to help our customers become more competitive. Let me structure the answer in three parts – what we offer customers, how new technologies invigorate our offerings, and how we organize ourselves to become easier to do business with.

ABB is a business-to-business supplier, in more than 100 countries around the world. We have world-class products, systems and services that boost efficiency and productivity while minimizing energy consumption, raw material usage and environmental impacts. And we have deep insights into the market conditions, business dynamics and competitive success factors of our customers.

As to innovation, technology is key in our industry. Our own research naturally focuses on providing the next generation of products and services, responding to as well as anticipating customer needs.



But in addition to that, we are embarking on a mission to create one single Industrial IT architecture for our entire range of technologies and products. This, briefly, means that we aim to seamlessly integrate ABB's offerings wherever they are used. 'Plug and produce' is the catch phrase – giving customers the power to manage complexity in real time, all the time.

A great enabler here is the Internet, and new Web-based technologies that allow the forming of dedicated online communities along the whole value chain – linking suppliers, manufacturers and customers in real-time collaboration. That is one additional advantage of an integrated Industrial IT architecture.

So what could we do to become easier to do business with, and better enable our customers to capitalize on technological advances and the developments in their markets?

To build on the power of being close to customers, we're organizing into six customer divisions. Four of them focus on customers who are end-users, wrapping all ABB products and services into their portfolios – Utilities, Process Industries, Manufacturing and Consumer

Industries, and Oil, Gas and Petrochemicals – while the other two serve external channel partners like wholesalers, distributors, original equipment manufacturers and systems integrators – Power Technology Products and Automation Technology Products. In addition, we have created a business area called New Ventures to incubate opportunities even faster.

We are making these changes to our organization alongside the drive toward a single Industrial IT architecture to fulfill our vision of ABB as *The Value Creator*, where customers have easier access to ABB's entire range of technologies through one common interface.

In this special issue of *ABB Review*, we will share with you how our technologies support this vision. How Brain Power is put to work, and how ABB builds knowledge for tomorrow's world.

A handwritten signature in black ink that reads "Jörgen Centerman". The signature is written in a cursive, flowing style.

Jörgen Centerman  
President and  
Chief Executive Officer

## Creating value through technology



In this issue, *ABB Review* deviates from its practice of reporting in detail on select items from the ABB technology portfolio to devote all of its pages to a much wider selection of the newest ABB ideas and products.

The traditional image of a researcher or developer often invokes the idea of seclusion and anonymity – the lab-coat-wearing, persistent and bespectacled professor toiling away with gadgets and computers, test tubes and microscopes.

It is an image that isn't entirely incorrect. We *do* work hard and we *do* work long into the night to develop breakthrough technologies that change the way the world works and the way industry does business. And, often, we are fanatical in the way we strive to improve our rates of innovation and maintain our scientific integrity.

What needs to come through more clearly in these days of rapid globalization and feverish competition is *value*. Delivering value to customers, shareholders and ourselves is a simple concept – but it is often poorly executed. What we've learned inside ABB is to pursue research and development that provides solid returns for the customers who buy our products and systems. At the same time, we must continue pushing the limits of convention.

In the pages that follow, you will see only a snapshot of what we do here inside the laboratories of ABB. But, I think this simple snapshot reveals a portrait's worth of information. This may be grouped around four main platforms

of development: Industrial IT and its applications; Electrical systems technology; Oil, gas and petrochemical technology; Sustainability and alternative energy technology

This platform approach allows our finest minds to concentrate on research that has tangible values across all our businesses – to meet customer demand for everything from windfarms and robots to power electronics and Industrial IT enabled systems for asset management.

In the *Industrial IT* section, you will see the concept as a vision, an architecture, a business model, and an integrated technology strategy. This issue of *ABB Review* outlines the technology behind Industrial IT and describes how it works in technology applications. In the future, every single ABB technology will be Industrial IT enabled.

*Electrical systems technology* covers the study and development of power electronics (devices and components), power products and systems, high-voltage electromagnetic systems, micro-electromechanical systems (MEMS) and sensors and actuators.

*Oil, gas and petrochemical technology* includes, but isn't limited to, upstream separation and control, on the seabed as well as on platforms and downstream; catalysis and chemical processes, mechatronics – using advanced materials and smart controls; and nanotechnology, which I will come back to later.

The last platform deals with ABB's *sustainability and alternative energy technology*. This platform covers



### Industrial IT and its applications



### Electrical systems technology



### Oil, gas and petrochemical technology



### Sustainability and alternative energy technology



Four main platforms of development

innovative distributed power solutions – from wind power to fuel cells, micro-turbines and combined heat and power – right through to new solutions for online engineering systems and specialized meters for energy management.

Just some of the highlights of this issue are:

- ABB's most recently developed Industrial IT software products.
- Hydrocracking technology, developed with a joint venture partner, to produce cleaner fuels.
- The Motorformer™ cuts energy losses in motors, reduces the need for potentially hazardous oil insulation and saves space. This invention builds on other products that make use of the same technology platform, like Powerformer™ and Windformer™.
- Armada<sup>CMS</sup> software – for condition-based predictive maintenance in plants and utilities.

- ABB's advanced silencer cuts out noise in heating, ventilation and air-conditioning systems.

- Software for even better plant productivity.

- Just a few of the ways in which ABB is exploiting the Internet.

Looking ahead, some areas of emerging technology fit in with the way that ABB approaches the development of innovative new systems and products. They are software, nanotechnology, micro-electromechanical systems and wireless communication.

*Software* – both related to our products and as an enabler to our processes – is the technology that will make us tick as we go forward. We will continue to pursue promising areas of software development, like component, middleware and integration technology, data mining, agent technology, Internet applications and software engineering.

*Nanotechnology* is about creating and understanding materials and structures on a much smaller scale. Once we understand materials on a molecular level, it becomes possible to re-engineer them so that they are easier to control. We can enhance certain properties, like electrical conductivity or heat resistance, to tailor the materials to new applications.

Catalysis is a prime example of nanotechnology in action, and one in which ABB is already finding ways to optimize the production of petrochemicals. But it applies equally to electrically conducting or insulating materials, or to components for fuel cells or solar cells – advances that will be crucial in the development of more efficient and environmentally friendly energy production.

Nanotechnology is also critical in the development of sensors and control systems, particularly in building

measuring systems that operate faster, more efficiently and reliably in different production environments. This microscopic understanding holds the promise of making systems that can be shrunk so that they are easier to integrate.

On the next level up are *micro-electromechanical systems* (MEMS). MEMS is the technology which integrates intelligence – computer and communication – with mechanical structures at the microscopic level. Since chip technology is the driver for MEMS, we can expect enormous cost-savings, as the number of components that can be fitted on a chip roughly doubles every 18 months. Other benefits are equally obvious: increased functionality, greater energy efficiency, less use of consumables, higher reliability, etc.

*ABB Review* will turn to the topic of MEMS in some detail during 2001.

*Wireless* promises to be the technology to watch over the coming year. We are on the brink of a revolution in wireless technology which will for the first time – whether in short-range radio systems like Bluetooth™ or wireless local area networks (LAN) or in longer range mobile systems – allow for efficient connectivity, all of the time. We are getting closer to realizing the vision of the fully linked enterprise. One need look no further than our Industrial IT platform to see the potential of empowering our engineers with wireless monitoring and testing devices.

The mobility and responsiveness that this will bring to a whole range of industrial applications – from remote system operation and data transmission, to supporting sales, maintenance and servicing – are only now becoming apparent. Combined with broadband and

collaborative technologies, wireless will enable us to further develop a range of customer-oriented solutions.

The next edition of *ABB Review* will feature an in-depth look at the Bluetooth short-range radio system.

The speed of innovation, both inside companies like ABB and in the world of

on the competition. We aim to stay ahead.

Investments like these, coupled with what we consider to be an outstanding, multicultural team of scientists and engineers, are helping to pave the way for increased customer and shareholder value.



R&D inside ABB delivers results that make customers faster, more efficient and more profitable.

academic research, means that any technology company worth its salt must be serious about stimulating inventiveness. And it must be earnest about getting its scientific experts and engineers to work quickly to realize the value of their work and register their inventions. ABB dedicates huge amounts of energy to make sure that process works effectively.

Increasingly, we are inventing the information technologies needed to track the value of research and development and to speed up the processes of the customers we serve. This clear strategy, marked by our strong and early move into advanced industrial software development and into the provision of value-added services, has given us a lead

To wind down from this hectic race through the technology of today, we conclude this edition with a light-hearted look at how such technology could affect the way we live in 2015 and at what the *ABB Review* reader in that year might be reading.

So, for the moment, please fasten your seat belts, sit back, and enjoy this express trip through the ABB Technology landscape!

A handwritten signature in black ink, appearing to read 'H. Markus Bayegan'. The signature is fluid and cursive, with a prominent 'H' and 'B'.

H. Markus Bayegan  
Chief Technology Officer,  
ABB Group R&D and Technology