A photograph of an industrial factory floor. In the foreground, a large orange robotic arm is in motion, blurred to suggest speed. In the background, another similar robotic arm is visible, working on a production line. The environment is filled with industrial equipment, metal structures, and safety railings.

Practicing what we preach

ABB promotes the use of robots in manufacturing and uses them to manufacture ABB products

Åsa Rylander, David Marshall

Robots have made a major impact on the productivity and safety of manufacturing industries. They are primarily used for material handling, moving products around the factory safely, but also offer reliability, tirelessly carrying out highly repetitive tasks, sometimes in hazardous environments, increasing safety in the work place.

ABB is a leading manufacturer of industrial robots and has played a significant role in promoting their use in industry. In fact ABB not only recommends their use to customers, but also use them to improve the efficiency of ABB's production lines.

Producing efficient products using highly efficient production methods remains a strong focus for ABB. ABB's Low Voltage (LV) Motors factory in Västerås, Sweden has not only optimized its production through the use of ABB robots, but has also recently developed and launched, in 2008, a new generation of highly efficient motors.

Sustainability and energy

ABB has been producing LV motors at Västerås, Sweden since 1947. Large black and white photos, taken over 50 years ago, line the walls of a corridor at the factory showing dozens of busy men and women hand assembling motors. Today, 19 robots keep the ABB LV Motors factory competitive despite the emergence of rival companies in low-cost countries. The factory employs 210 personnel and produces 100,000 LV motors per year. A two-pronged strategy was adopted by ABB to remain competitive. ABB not only focused on product development, launching new innovative generations of highly efficient motors, but also focused on the efficient manufacture of its product.

Improved cycle times of as little as 80 seconds for the assembly of small motors have contributed to the success of ABB's Västerås motors factory.

By automating the production process fewer people were required, reducing production costs and associated expenses that result from fluctuations in demand. ABB has many years of experience in the automation business and is particularly well equipped to automate production processes. The application of ABB robots to the production of motors ranging from units weighing 500 kg down to units weighing just 30 kg, has reduced production cycle times. The cycle time for the assembly of small motors, for example, is now only 80 seconds. Improved cycle times and reductions in personnel have contributed to the success of the Västerås motors factory. Six robots on the assembly line, for example, allowed 30 percent savings in personnel.

The first ABB robot was an IRB 6, installed in the foundry of the factory in 1974, and since then a wide range of robots have been installed¹⁾. For the most part these robots have been employed to transport materials, but have also been used to automate most of the production processes, including welding, casting, pressing, winding,

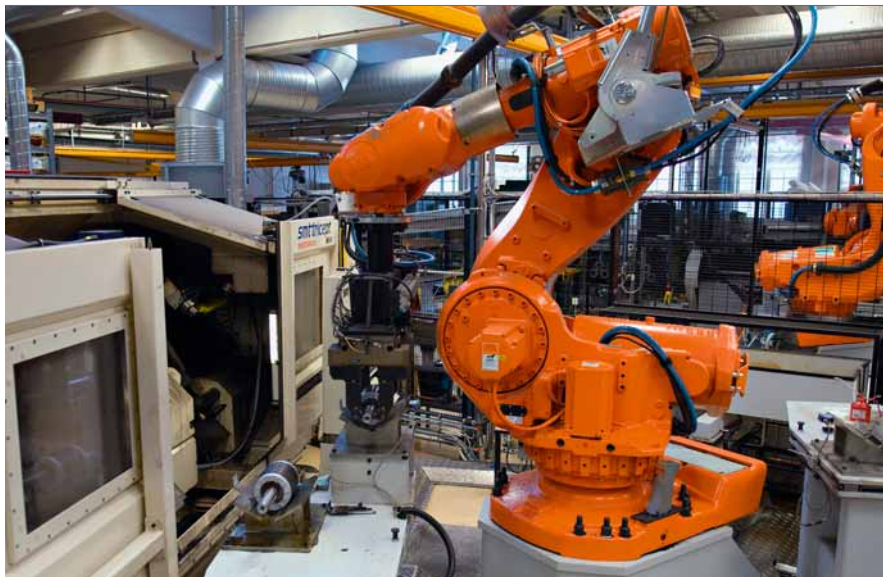
assembling and packaging^{1 2}. Since their introduction, much of the heavy lifting, previously carried out either manually or by cranes, is now done by robots, helping to reduce the risks of injury to workers on the production line³. The ABB LV Motors factory in Västerås is now one of the most modern ABB motor manufacturing facilities.

Of course automation is not the only important focus of attention required for a LV motors factory to remain competitive. The products must remain innovative and competitive. Motors are used in just about every

industry, for example to power pumps, compressors, fans, cranes, paper mills and many other machines. About 65 percent of electricity is consumed by electric motors in industry, so huge savings in carbon emissions and wasted power could be made by relatively small improvements in the efficiency of motors. Efficiency is a measure of how well a motor converts electrical energy to useful work.

While the ABB Motors product catalogue rates the efficiency of different motors at about 95 percent, this still means that 5 percent of the electricity gets wasted in terms of dissipated

1 Winding by an IRB 7600



2 Packaging by an IRB 6400



Sustainability and energy



heat. To address this problem ABB LV Motors have developed a new motor generation. For the new M3BP motor type, the losses have been reduced by about 5 percent compared to those of the older generation motor series ⁴.

If the production of the new series of motors replaces the older generation motors in terms of the volume produced at the factory, the yearly carbon dioxide emissions reduction would be equivalent to the emissions from 90,000 cars.

Nineteen orange robots keep the ABB LV Motors factory competitive despite the emergence of rival companies in low-cost countries.

The new product portfolio also includes a premium range, M4BP-type motor, with 10 percent lower energy losses than the M3BP-type motors. If this range is adopted by industry, further reductions in forecast carbon emissions can be expected. Although carbon emissions do have an economic impact on industry the most attractive incentive to use this new generation of motors will be to reduce energy costs.

³ Heavy lifting by an IRB 6600



⁴ M3BP type motors



Åsa Rylander

ABB Automation Products
Västerås, Sweden
asa.rylander@se.abb.com

David Marshall

ABB Robotics
Milton Keynes, UK
david.marshall@gb.abb.com

Footnote

¹⁾ Three ABB IRB 4400 robots, 10 IRB 6400 robots, three IRB 7600 robots, one IRB 6000 robot, one IRB 60 robot and most recently in 2008, one IRB 6600 robot have been installed at the LV Motors factory in Västerås.