ABB in the railways
Energy-efficient solutions for a low carbon future

ABB is a world leading independent supplier of innovative and reliable technologies to train manufacturers and railway operators. With a comprehensive offering for rolling stock and infrastructure as well as FACTS, network management solutions and SCADA systems, ABB also provides lifetime service support, including maintenance and retrofit.

Business unit facts
Employees: Over 2'500 in 15 countries
2010 order received: More than US$ 1 billion
2010 revenues: US$ 900 million
Project presence: In over 30 countries

The mobility of people and goods is essential to today’s economy: Global trade is calling for the affordable and timely transportation of freight over long distances. Business and tourism depend on people travelling between cities. Growing urbanization means people are also commuting over longer distances within cities. At the same time, concerns over the environment, energy prices and congestion are calling for ways to minimize the economical, ecological and spatial footprint of transportation. These trends and the strong railway market has resulted in many projects for ABB in almost every country wherever rail transportation services are set in motion by means of electrical energy.

Market drivers
The rail industry is benefiting from:
- growing environmental concerns over CO₂ emissions, energy consumption, noise pollution
- rapid urbanization
- the need for greater and faster mobility of people and freight
- road congestion, spatial footprint and security are calling for cleaner, reliable and more efficient solutions.

Main Centers of Excellence
The Turgi plant in northern Switzerland is ABB’s Center of Excellence for traction converters. Just a few kilometers away are the Lenzburg power semi-conductor factory and our Dättwil global research and development facility. Together, the three sites form a “power electronics triangle” employing around 1,500 engineers. The factory plant in Geneva coordinates world-wide railway activities for the ABB Group and is the lead center of excellence in manufacturing traction transformers. Globally, ABB is number one in rail traction transformers with a market share of over 50 percent.

ABB’s offering to the railway industry
Covering everything from rolling stock to the construction and installation of complete power supply and control systems for rail networks, ABB enjoys a clear distinction in its market position as an independent supplier to most of the world’s transportation system integrators, vehicle manufacturers and network operators. ABB technologies serve in different types of rail application, ranging from freight through high-speed to suburban railways, metros and tramways.

In rolling stock, ABB is a market-leading manufacturer of traction transformers, traction motors and converters that supply the vehicle’s traction and auxiliary power. Our portfolio includes low- and medium-voltage products as well as semiconductors and surge arresters. For diesel trains, we are a leading supplier of generators and turbochargers.
In the traction power supply field, ABB's product portfolio includes traction substations that feed and distribute power to the lines; high- and medium-voltage switchgear, frequency converters and transformers that convert and supply power to the railway's catenaries (overhead power line supply); FACTS (Flexible AC Transmission System) which improves power quality to protect the network and the surrounding grid from voltage disturbance; network management and SCADA (supervisory control and data acquisition) systems that monitor and control rail and power distribution networks; and high-end expertise like system analysis and dynamic traction power supply simulations.

ABB also provides service, maintenance, refurbishment and retrofit solutions. Our broad range of services consists of spare parts, maintenance, upgrades and retrofit, on and off customer site. A customized bundle of services is available based on the customer's operating needs, on demand when needed or in multi-year service level agreements.

**Energy efficiency in transportation**

On board trains, the combination and design of traction components (generators, circuit breakers, transformers, traction converters and motors) are the main determinants of a train's efficiency.

ABB supplies individual components and is one of the very few independent suppliers of complete traction package to rolling stock manufacturers. This unique positioning and strong local presence in all major rail markets helps ABB to provide optimum solutions for vehicle manufacturers and train operators.

Key advantages and customer's benefits are:
- one single interface to the supplier
- total energy efficiency
- low life-cycle cost
- optimized dimensioning of components
- fast commissioning and homologation

**Case study: Deutsche Bahn, Germany**

ABB has developed a new traction converter to refurbish the first fleet of high-speed InterCityExpress trains operated by Deutsche Bahn, Germany’s national rail operator. This is the first project worldwide involving the exchange of high-speed train converters while leaving all other components of the traction chain and all interfaces unchanged. The converter, developed within just 13 months, has cut energy consumption by at least 12 percent and minimizes stress on the motors, considerably reducing operating and maintenance costs.