As the global leader in rail technology, Bombardier places environmental sustainability firmly at the top of the agenda. EBI* Drive 50 forms part of Bombardier’s ECO4* product range.

EcoActive Technologies

EBI Drive 50
Driver assistance system

The Climate is Right for Trains

Our products and services combine energy conserving technology with optimal safety, reliability and cost efficiency, which add value for our customers whilst protecting the environment for future generations.

ECO4 – energy, efficiency, economy and ecology

Addressing the growing challenges among operators to reduce Energy consumption, improve Efficiency, protect the Ecology while making sense Economically, ECO4 is the concrete validation of Bombardier’s declaration The Climate is Right for Trains*.

Rail Control Solutions
In today’s global environment, the need to conserve energy has never been greater. By reducing emissions, CO₂ footprint and resource usage, quality of life can be improved, both for worldwide populations today and for future generations.

Rising fuel prices, Europe-wide legislation and increased pro-environmental public awareness are all factors contributing to a drive for greater efficiencies in transportation systems.

Bombardier is at the forefront of initiatives to ensure that rail transportation – already an ecologically leading mode of transport – can further improve its performance.

Driving style influences energy consumption
The energy consumption of a train depends on three primary criteria: The train’s physical properties, its timetable and the track data. Yet measurements have shown that even for the same train, with the same timetable, on the same track, there can be a huge variation in energy consumption due to different styles adopted by drivers in running their trains.

Driver assistance – improving cost efficiency and punctuality
By introducing driver assistance systems, it is possible to make recommendations to the driver concerning velocity and acceleration, or deceleration, to minimise the energy needed to run a train according to its allotted timetable. The systems not only generate energy consumption savings, but also ensure that trains arrive on time. Furthermore, smoother operation of a train will result in reduced wear on brakes, wheel-sets, engines and tracks.

EBI Drive 50 assists drivers in optimising their driving style with a view to conserving energy. Based on calculations from track topography, timetable and train properties, combined with the knowledge of the train’s route, actual position and the current time, EBI Drive 50 can save up to 15% of the traction energy. Furthermore, due to increased energy prices, the return on investment is also greater.

EBI Drive 50 – driving the future of energy management

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EBI Drive 50

Saving energy, costs and reducing wear

- Traction energy saving up to 15%
- Reduced energy costs
- Quick return on investment
- Consistently punctual trains
- Reduced wear to:
  - Wheel sets
  - Engines
  - Brakes
  - Track
- Applicable to all types of engines
The EBI Drive 50 System

*EBI* Drive 50 consists of software operating onboard a train, a communication gateway to the wayside and central workstations to keep the required data up to date. The onboard software utilises Bombardier’s telematic units or is embedded into the Bombardier onboard Train Control and Management System. *EBI* Drive 50 is suitable for new trains and can also be retrofitted to existing vehicles.

The position and punctuality of the train is determined by GPS. Enhanced accuracy and continuity of the positional information is made possible by combining this with onboard sensor data from accelerometers, odometers or radars. The system calculates speed and traction force profiles, and the recommendations on the optimised target velocity and traction force are continuously updated to the actual position and time and are displayed in the driver’s cab.

Following the recommendations from *EBI* Drive 50, the energy consumption of electrical locomotives, diesel engines or any form of hybrid traction vehicles can be minimised. Multi-traction systems or different schemes for distributing locomotives within a train can be taken into account as part of its calculations.

**Flexible to suit individual operators’ requirements**

According to customer requirements, Bombardier can provide driver machine interfaces for driver assistance systems that are tailored to enhance the driver’s awareness of specific information. For example, by focusing on the difference between recommended and actual traction force as well as on recommended versus actual velocity, drivers can easily learn to improve their driving style.
Proven technology from an industry market leader

Bombardier has been testing the principles of driver assistance algorithms from as early as December 1999. Further trials of EBI Drive 50 in service took place in January 2000 with Swiss operator SBB on an ICN train on the route from Zurich to St Gallen. It was successfully proved that drivers adhere to timetables and use significantly less energy if they are following the recommendations of EBI Drive 50.

Energy saving projects

Bombardier is currently developing its EBI Drive 50 technology and is participating in two important European projects that address energy savings:

**RailEnergy** is a European Union funded project running from 2006 to 2010, bringing together railway operators and suppliers to decrease the specific energy consumption of the railway transport system.

**DemoOrt/DSM** is funded by the German government and supervised by the independent German Aerospace Institute (DLR). Following the development of prototypes from 2004 – 2006, energy savings due to driving style assistance are being demonstrated and evaluated with production equipment.

Using a PC-based train simulator, we can emulate actual scenarios and calculate the optimised energy consumption of the simulated train. We also offer studies or demonstrations on actual train operation.