Environmental factors are a major consideration for rail operators and their stakeholders. A key cornerstone of corporate responsibility is demonstrating responsible use of energy. Added to this, operating margins have come under increasing pressure from the escalating price of energy in recent years, so optimising and reducing energy consumption is crucial to ensuring continued business growth and profitability.

Knowledge and Expertise to Boost Profitability

Bombardier’s Energy Management Control System is designed to integrate energy awareness, efficiency and carbon control into an operator’s business where it may be applied to both new and existing fleets. The system provides customers with an accurate and affordable fleet energy management solution, using data gathered from the trains and flexible and intuitive visualisation tools based on methods proven in the BOMBARDIER® ORBITA® system. The objective is to provide useful information to train the operator’s management team for them to proactively manage their energy spend.
Intelligent Energy Management

The foundation of most best practice management systems is an ability to measure and analyse. Bombardier has taken this view with energy consumption and quickly realized that operators have often had to rely on rudimentary and often ineffectual methods of gauging energy usage.

Combining creative thinking with advanced technology and know-how, Bombardier’s clever metering system will be suitable for retrofit to existing vehicles, both diesel and electric. Combined with the power of Bombardier’s data collection and analytical tools, designed for reducing energy consumption, customers will be provided with easy-to-understand consumption information and advice. The ability to overlay this data with, for example, driver input and route characteristics, will give the operator a much clearer view of how and when their vehicles consume energy. This process can take place at every stage of the journey, whether standing at the depot or en route.

Crucially, expert data analysis provides advice to guide the action steps necessary to conserve energy with immediate impact on reducing consumption.

Operators cost breakdown
Research suggests that about 5% of the operational costs for a train operator are directly linked to energy. Reducing this cost quadrant instantly has a positive impact on a company’s profitability.

Integrated Fleet Energy Management

Bombardier’s Energy Management Control System aims to save energy and, at the same time, grant operators the peace of mind of knowing that their trains are ready and able for immediate service.

Drilling down on the summary data reveals further detailed graphical data. Bombardier’s ORBITA platform can be utilised to provide visual information from various data capture sources.

Bombardier’s end-to-end concept ensures an integrated approach: from data logging and file transmission, via data analysis and report construction to management information provision. Key performance data, such as fuel usage, is collected from selected vehicles and compared to the “Golden Run”, a term used to describe the most efficient possible train run from station to station. The
differences between the actual data and the “Golden Run” identify areas of potential energy savings.

The beauty of Bombardier’s Energy Control System is that it is modular in design and highly adaptable, in that it can be used for diesel or electric, Bombardier or legacy fleets. It also includes advanced mathematical methods that can estimate energy usage on trains not fitted with energy metering.

Committed to Sustainable Innovations

Expertise, creativity, market knowledge and vision are just some of the reasons why Bombardier is setting the industry pace in developing the most innovative and effective energy-saving solutions, tailor-made to operator needs. The Energy Management Control System has intelligence with a range of data including actual energy consumption, speed and position on the route. Examples of key areas where Bombardier’s knowledge and expertise can help to reduce energy consumption include smart stabling and driver style management.

Smart stabling
A huge potential for operators to avoid wasting energy is when the train is stationary between duty periods. While switching the power off might seem the obvious solution, it is not always practicable, as this introduces an operational risk that the train may need further attention before being ready for traffic again. Also, power is needed to enable maintenance and cleaning activities and to ensure optimum passenger traveling conditions, example temperature and safety systems. The suggested approach works, for example, by dimming lights and regulating heating while the vehicles are stabled, keeping the vehicles in a “warm standby” mode until full power is needed for operation.

Driver style management
Bombardier participated in a joint study by ATOC (UK Association of Train Operating Companies) and National Express, which identifies that one of the largest variable factors in energy management is driving technique.

The study demonstrated that there is up to 11% difference in energy used between flat-out drivers (those who use full brake and throttle) and drivers who are sympathetic to conditions. Another study undertaken by a major European operator indicated that enough energy can be saved in just one journey of approximately 750 km to heat an average four-bedroom house for a year through more sensitive driver technique.
Solutions for the Railways of Today and Tomorrow

Bombardier’s commitment to discovering new and better ways of saving energy means that we have a wide variety of inspirational ideas in the pipeline at any given time. Our strategy is one of continuous development with the aim of establishing solutions that have the most positive impact on energy efficiency, both now and in the future. We have a comprehensive range of ground-breaking new products and services coming to fruition in quick succession that can be applied to existing fleets. Equally, this knowledge and capability is also applied to new vehicles through our vehicle divisions.

Key benefits of Bombardier’s Energy Management Control System:
- Remote monitoring and metering of fleet energy consumption and operational data
- Combining energy consumption and operational data into effective management information
- Sophisticated analytical tools for comparative fleet analysis to guide