

# Railway system energy management

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Sféra, a.s. was founded in 1992, and since then the company has become established in sustainable development on the IT market, with a long-term focus on the sectors of power engineering, transport and industry.

Since its establishment, the company has been focusing on the research, development, supply and implementation of technically-oriented graphic information systems and on the digital processing of cartographic and map works. Its solutions cover the processes of asset management and maintenance management as well as the processes of the life cycle of large technological units owned by big industrial and energy companies. It also covers the processes of investment, construction, and the design of energy networks. Later,

this activity was supplemented with the design, supply and support of business information systems for the energy sector and as well as consulting, advice and analyses.

The company aims its research and development at perspective fields of data analysis, smart grids, artificial intelligence (AI) primarily for the sectors of energy, transport and maintenance.

## ENERGY EFFICIENCY ON RAILWAYS? LET'S GET DOWN TO IT!

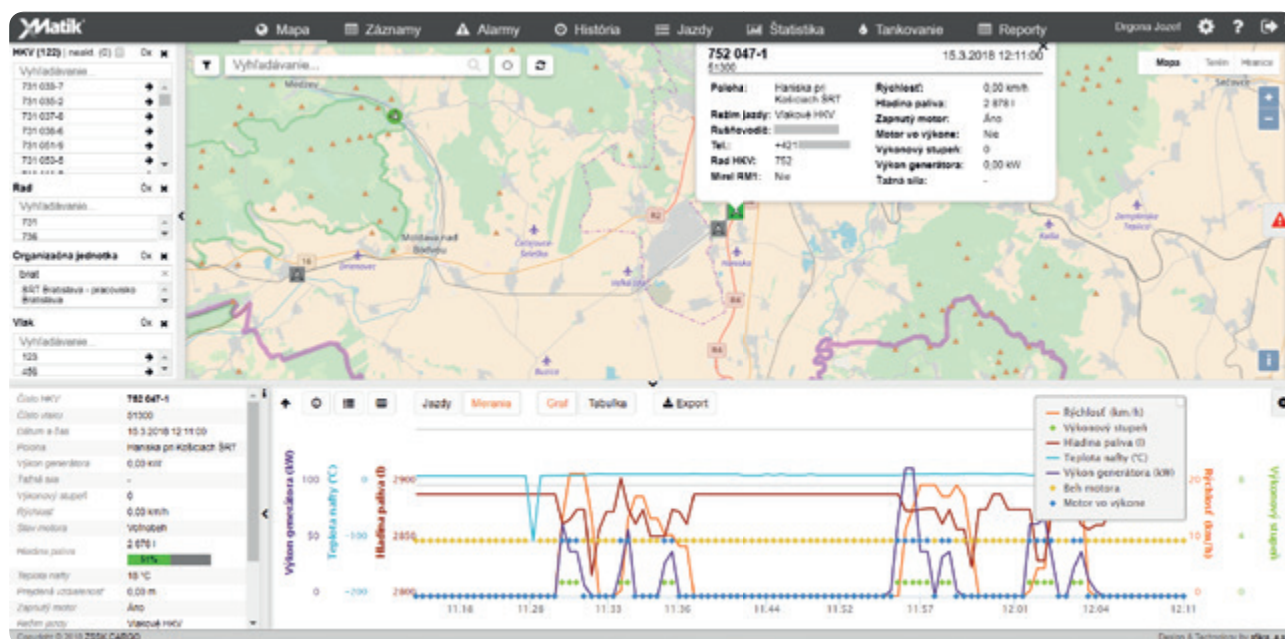
At present, the monitoring and optimisation of consumption of traction electricity and diesel have been an issue which almost every carrier wants to find. Carriers' costs of traction electricity and diesel range from hundreds of thousands to millions of euros a year, depending

on the carrier's size. Even a small percentage saving means a significant reduction of the carrier's costs.

sféra, a.s. has been dealing with cost optimisation since 2009. A team of experts has succeeded in developing unique products focused on the solution of cost optimisation and the preparation of data that is necessary to adopt strategic decisions.

Our knowledge comes from practice. At present, an energy control room system has been used by a SR infrastructure manager and the two biggest carriers in the Slovak Republic, Železničná spoločnosť Slovensko, a. s. and Železničná spoločnosť Cargo Slovakia, a. s..

The companies have profited from the system mainly in the following fields:



- Optimum use of a tractive rolling stock (TRS) within a selected traffic route.
- Indication and warning of negative conditions related to the TRS operation.
- Minimising the thefts of traction diesel.
- Detecting anomalies in consumption at the time a new or repaired TRS is put into operation.
- Providing a train driver with instructions for a better TRS operation.
- Providing information in order to compare a planned and an actual consumption diagram for electricity supplier.
- Preparing a diesel consumption plan.



An energy control room does not only deal with the monitoring of consumption, but also with factors that directly affect it, such as the position of a tractive rolling stock (TRS), a train driver's driving style or extraordinary stops. Thanks to advanced instruments, it is possible to evaluate specific journeys and the whole sets of rounds. For example, we can use the evaluation of train drivers' driving style, where a 20% difference in consumption has been achieved depending on the driving style.

All the above factors affect total costs and they also can be used for a more effective management of carriers' business activities. Thanks to the instruments that make it possible to evaluate train positioning data by means of GPS, a space for the predictions of TRS or whole trains

journeys has been created, resulting in a more efficient transport system.

In standard mode, the system offers the possibility of automatic reporting for groups of workers according to their profession, either for control room staff or for energy, maintenance, and company management staff. In order to inform employees in real time, the system includes an implemented system of alarms and an automatic control mechanism. The system makes it possible to define critical events and persons can be notified by means of e-mail, SMS or warnings within the system.

Forecast of energy commodities consumption as well as optimisation of energy efficiency are trends which European companies seek and sféra is able to support them. ●



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