Eress
MAGAZINE

2025

Welcome

In this issue, we're proud to highlight our latest initiatives, including the 2025 ERA study commissioned by DG Move, and the recent status of energy metering installed on trains, data collection, settlement, and transparent invoicing across Europe. These developments are key to promoting greater efficiency, interoperability, and sustainability in railway energy management. We also take a closer look at Eress's latest Master Data project, aimed at streamlining cross-border energy data exchange and strengthening the foundation for a more integrated European rail network.

Agenda

Eress 10 partners

With 10 partner countries, Eress has strengthened its position as the leading European partnership for railway energy, ensuring efficiency, transparency, and sustainability in energy usage across national rail networks. With a collaborative approach, Eress facilitates seamless cross-border energy management by implementing standardised solutions for its partners. As more Infrastructure Managers join the partnership, the initiative continues to drive innovation and improve energy cost allocation.

By working closely with infrastructure managers and railway undertakings, Eress enables precise energy consumption tracking and fair billing, eliminating inefficiencies in the sector. With a focus on interoperability and sustainability, the partnership supports the European Union's vision for a greener and more efficient railway system, fostering the transition to a more electrified and environmentally friendly transportation network.

"We are proud to now have 10 partner countries working together to replace fragmented national approaches with standardised international solutions for the benefit of the European railway energy sector", says Eress Director, Dyre Martin Gulbrandsen

AI makes life easier for

Artificial intelligence (AI) and smart data analytics are transforming the railway energy sector by optimizing energy consumption, reducing costs, and improving efficiency for train operators. AI-powered predictive analytics enable companies to anticipate energy demand, adjust consumption dynamically, and minimize waste.

Additionally, machine learning algorithms help detect anomalies in energy usage, preventing inefficiencies and ensuring a smoother railway operation.
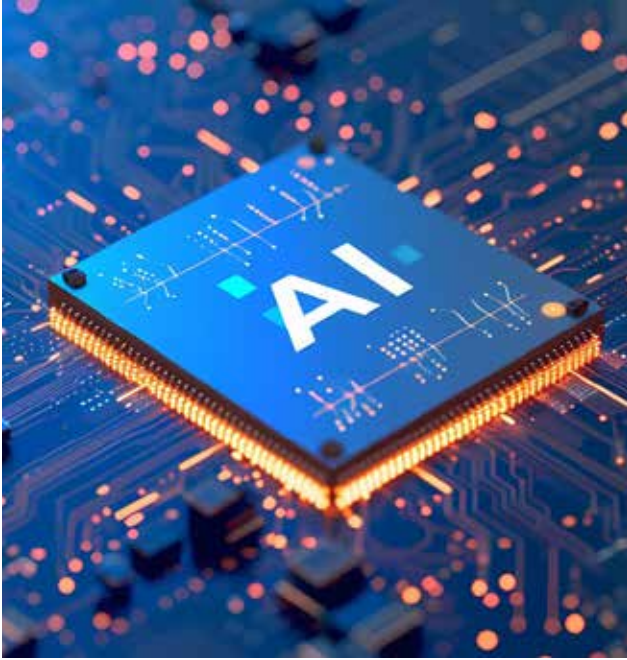
r Train Companies

By leveraging real-time data insights, railway companies can make smarter decisions regarding energy procurement and consumption. AI-driven automation enhances billing accuracy and streamlines settlement processes, reducing administrative burdens for railway operators.

As digital transformation accelerates in the railway sector, AI and big data continue to play a crucial role in making rail transportation more sustainable, cost-effective, and technologically advanced.

Author: Giacomo Potenza, Economic Evaluation Officer, EU Agency for Railways

ERAs' study on energy metering

The European Commission is actively monitoring the implementation of regulations governing energy metering, exchange, and settlement across the railway sector. The goal is to standardize processes and enhance transparency, ensuring that Infrastructure Managers across Europe comply with established protocols for energy efficiency.

By enforcing these regulations, the Commission aims to create a level playing field, preventing discrepancies in energy consumption reporting and billing. This regulatory oversight is crucial for the seamless operation of international rail services, as accurate metering and data exchange are essential for fair cost allocation and sustainability efforts.

By promoting adherence to these regulations, the European Commission is strengthening the integrity of railway energy management, reducing carbon footprints, and optimising the overall efficiency of the continents' railway networks.

Eress Master Data: A hub for all EU traction units

In train infrastructure management, master data includes crucial information for cross-border registration and sharing of data. This includes metered data, which facilitates settlement, by using real train operation data, reducing the manual steps by providing a central repository for essential information.

Today, each European country has its own way of handling master data. This makes the current landscape for master data fragmented, and in many cases leads to double work, inconsistencies, and inefficiencies.

Eress is currently establishing a Master Data HUB Service (MaDas) for Traction Units in Europe to address this need for a single, reliable data source for Infrastructure Managers, Train Operators, Vehicle Keepers, Maintenance Companies and other external collaborators. This initiative aims to enhance data quality, reduce costs, and foster cross-border collaboration by using one unified source for its data.

Collaboration among stakeholders is essential to create a European Master Data HUB Service. So far in the project, 10 European countries, the Eress partners, are currently involved in the development. Eress is also planning to test and involve external parties to make the service as useful as possible for other European Infrastructure Managers. With MaDas, Eress is paving the way for a more integrated and efficient rail network.

Development of Railway

For the past eight years, the Sustainable Development Foundation has conducted an annual survey on railway energy in Europe on behalf of Eress. The findings have been regularly presented at the Eress Forum and published in the Eress Magazine.

Since ERA is currently conducting a study about energy metering, we have focused on the development of the survey in Europe throughout the last years.

The primary aim of the survey is to provide a comprehensive overview of the state of the rail energy sector in Europe, capturing stakeholders' perspectives on a wide range of topics—from regulatory developments to technological progress. It also gathers opinions on critical issues such as interoperability, political engagement,
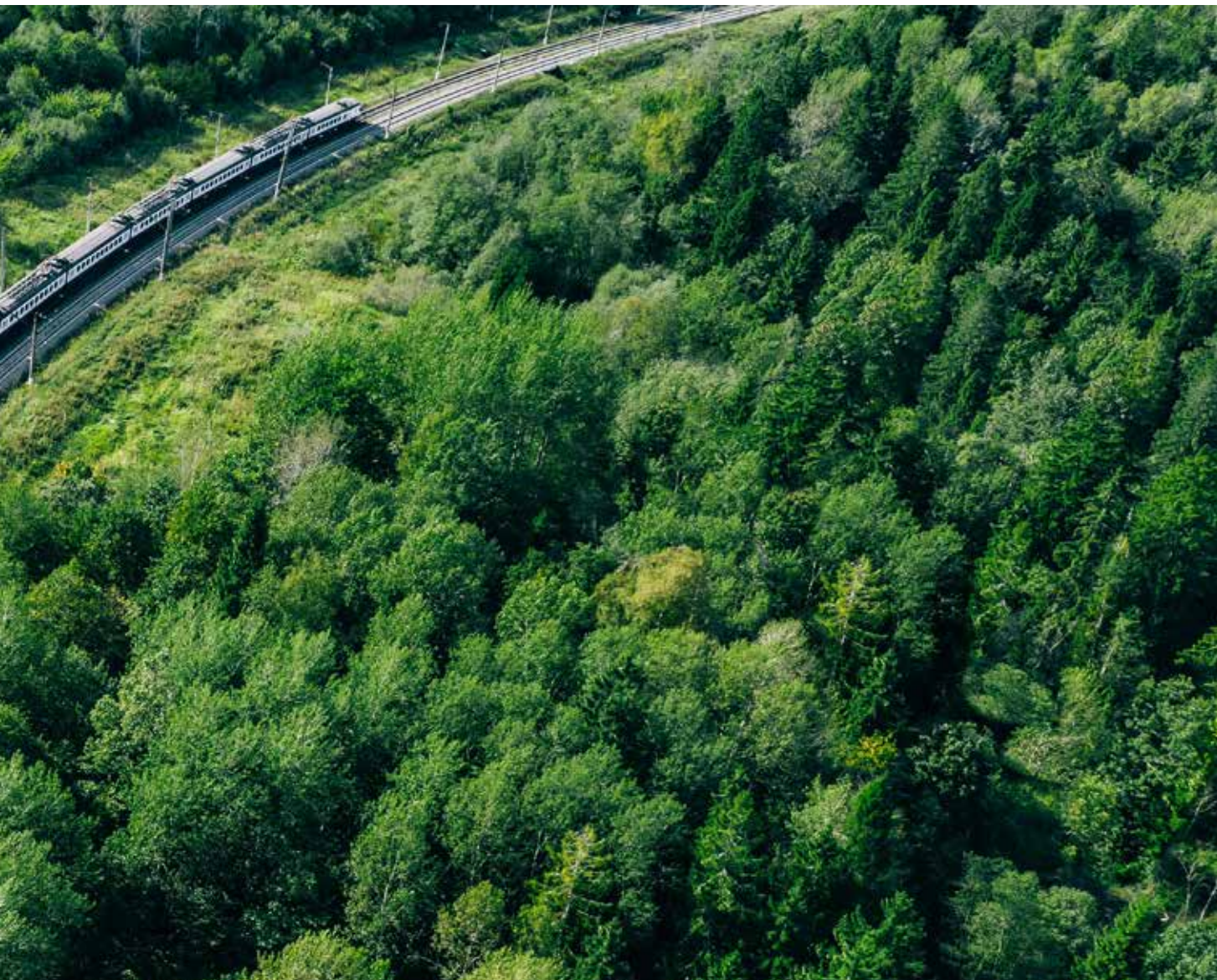
y Energy in Europe

and collaboration within the sector. Each year, the survey includes a special focus on timely or high-impact topics, such as the Covid-19 pandemic, rising energy costs, regulatory changes, and stakeholder cooperation. This year, for the first time, a summary of key indicators from the last eight editions were analysed to identify emerging trends over time. It's important to note that the survey was originally designed to provide a snapshot of the sector at a given point, not for long-term trend analysis. Consequently, some questions have varied slightly from year to year.

The number of respondents has also differed annually, ranging from 17 to 36 participants, and includes a broad mix of Train Operators, Infrastructure Managers, and other industry stakeholders.

Key Highlights and KPIs

In 2017, the first year of the survey, 20% of respondents said their country had no onboard energy meters. From 2020 onward, all respondents confirmed the presence of meters, and the question was no longer asked after 2023.

Another notable trend is the growing percentage of traction units equipped with meters. The number of respondents reporting 75–100% metering has steadily increased, with over half confirming high coverage. In 2024, 40% of respondents stated that all their traction units had energy meters.

The use of Data Collecting Systems has grown: in 2017, 62% of respondents said they had one or planned to adopt it, rising to 86% in 2024.
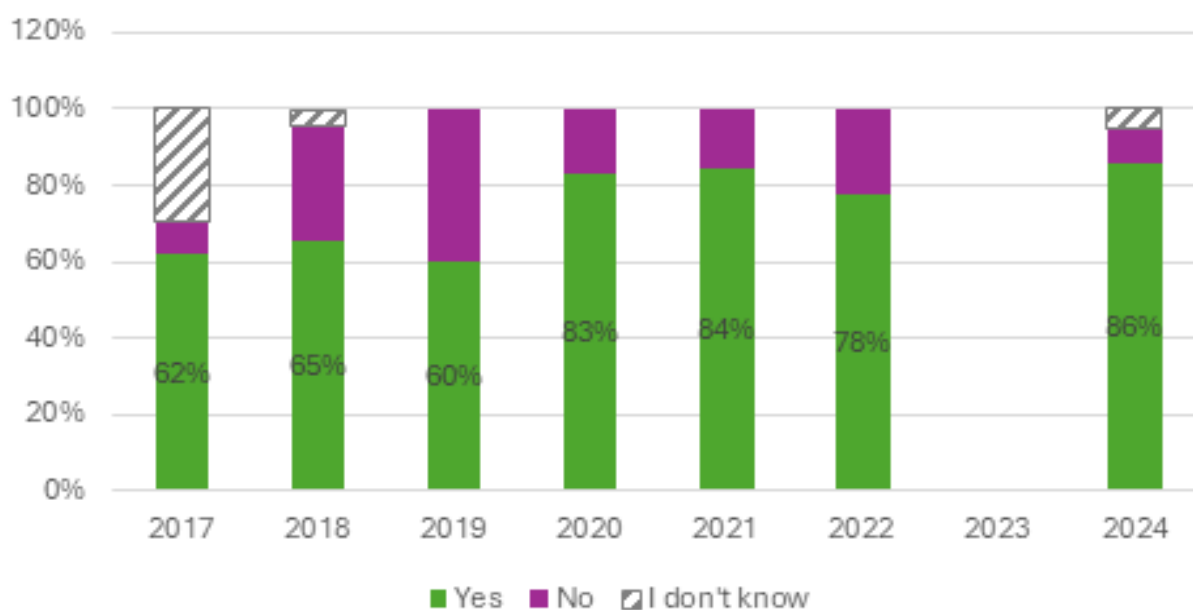
* Question not included in 2023

Eress & the Sustainable Foundation have followed the railway energy development in EU since 2017

A similar trend is seen with Energy Settlement Systems. Over the eight years, the percentage of positive responses has steadily increased, exceeding 90% in both 2023 and 2024.
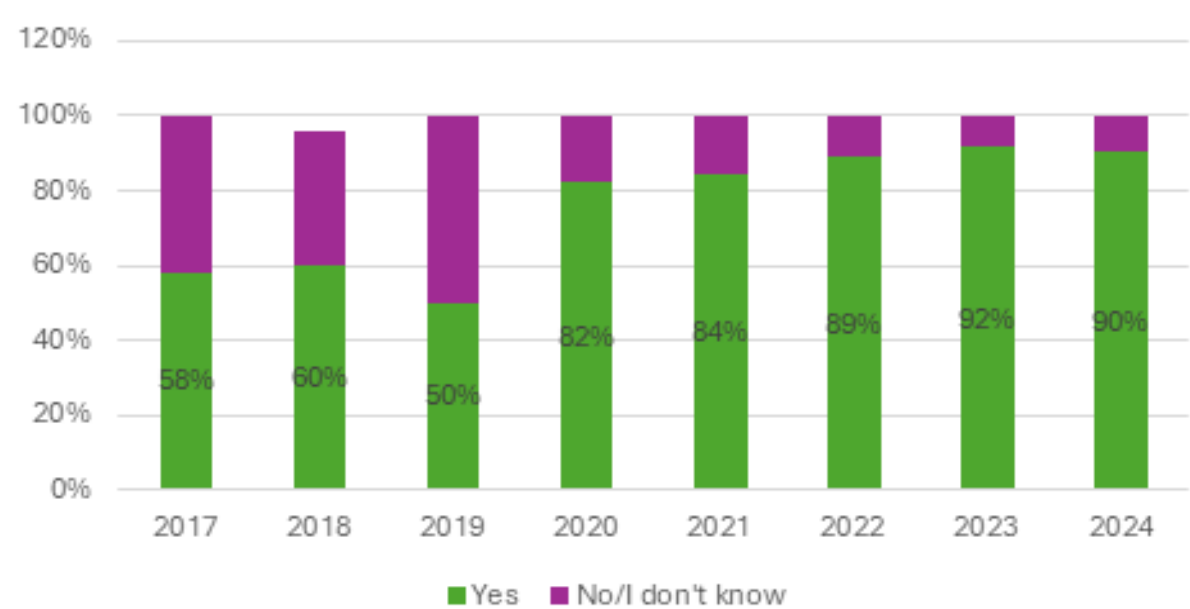
The survey looked into whether railway companies have adopted targets for reducing greenhouse gas emissions and improving climate performance. The survey was carried out for the first time in 2017, two years after the Paris Agreement.

From 2020, a more specific question about these targets was included, and in 2024, it was replaced with even more detailed ones. Over the four years where this question was asked, the number of positive responses remained stable, suggesting that the companies committed to these goals did so early on — showing the sector's strong commitment to environmental sustainability.

Although not originally designed for trend analysis, the survey data from the past eight years reveals clear progress in the European railway energy sector. There is a constant increase in the adoption of energy metering, data collection tools, and energy settlement systems, reflecting greater efficiency and a stronger focus on sustainability. The data also suggests a growing commitment to interoperability, supporting a more integrated and collaborative railway network across Europe. Although progress is encouraging, there is still work to be done to expand coverage and involve more countries. Nevertheless, the sector is moving on a solid and promising basis.

Early days: Eress Fo

Hereunder: Here you can see all the participants in this group picture in 2010 in Copenhagen
Right under: Bart Van der Spiegel speaking during Eress Forum in 2009 in Brussels
Right up: The conference was held again in Brussels in 2011. Here a view from the conference

2010

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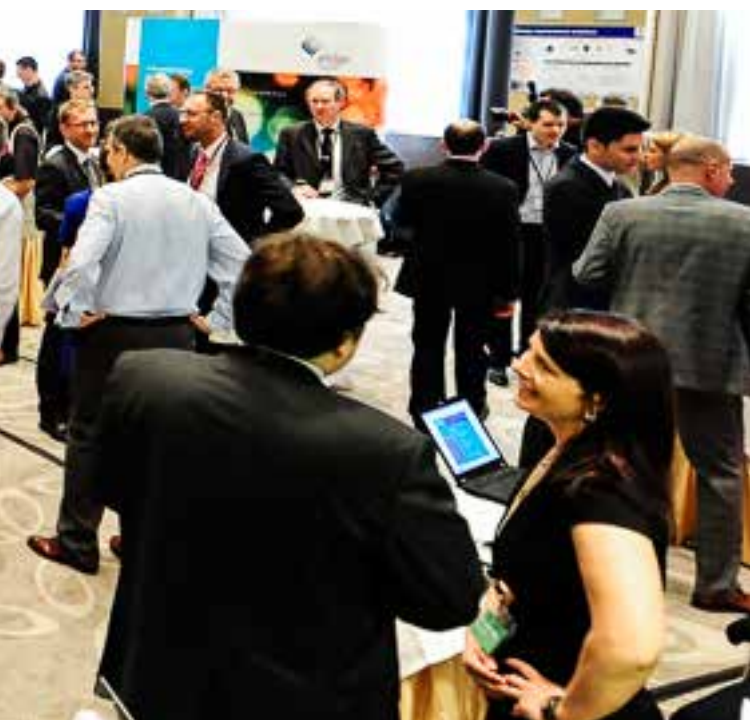2011

2009

Infrabel

Eress Forum

2009: Panel debate in Brussels
2012: Views from walking tour in Prague
2013: Sponsor exhibition hall at Eress Forum 2013 in Vienna

2013

2009

2012

2012

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Partners

Infrabel
Banedanmark
Vivens
CFL
Bane NOR
Trafikverket
Väylä
Adif
SBB
Infrastruturas de Portugal