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Rail's contribution to the European Climate Pact

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Summary

CER welcomes the opportunity to contribute to the development of the European Climate Pact, which is needed to fulfil the EU Green Deal's climate neutrality objective by 2050. All actors of the economy and society must take part in the pact, which could be a real game changer if it is driven by concrete climate-friendly actions and provides a forum to raise awareness of climate change. The COVID-19 pandemic is an unprecedented wake-up call to prioritise efforts in climate action. Railways have proved their vital strategic role to society during this period and expect a green recovery from the COVID-19 crisis to support sustainable mobility.

This paper presents rail's pledge and related actions to strengthen the pact. By 2030 railways aim for a 30% reduction in their total CO₂ emissions from railway operations compared to the 1990 baseline. This absolute CO₂ reduction target takes into account the expected overall growth in transport (modal shift goals of the 2011 Transport White Paper).

The pact should steer European transport on a path to full decarbonisation by 2050. A shift to a low- and increasingly zero-carbon transport mode like rail is a cost-effective way to achieve transport decarbonisation. CER therefore expects the pact to support modal shift initiatives to rail by increasing awareness of standardised carbon footprint reporting and the development of an eco-label for transport services.

Railways are ready to work with partners to detail these proposals and continue delivering sustainable solutions in the transition to a carbon-neutral economy.

1. Introduction

To achieve the climate neutrality objectives of the EU Green Deal (EGD), a 90% reduction in transport greenhouse gas (GHG) emissions is needed by 2050 and all transport modes will have to contribute to the reduction. Rail is already the most carbon-efficient motorised way to travel: rail accounts for less than 0.5% of GHG emissions from transport although it carries 17% of inland freight and 8% of passengers in Europe; rail is also very energy efficient, only 2% of the energy consumed in the entire European transport sector is needed to move freight and passengers by rail ([EU Transport in figures](#), 2019).

We need to significantly increase rail's share in transporting people and goods in order to overcome transport GHG emissions, the main obstacle in delivering the EGD commitments.

2. Rail's climate and energy targets

Rail is already the most sustainable mode of motorised transport and is fundamental in the path towards a more sustainable European mobility system and economy. Yet European railways commit to reduce their CO₂ footprint even further: according to the CER/UIC sustainable mobility targets, by 2030 railways want their total CO₂ emissions from railway operations to be 30% less than what they were in 1990 (and this notwithstanding the expected modal shift goals of the 2011 Transport White Paper).

The target of "absolute CO₂ reduction" will contribute to decarbonise transport in Europe and help protect the climate. This target is complemented by relative targets (expressed in passenger-km and tonne-km with a baseline 1990), summarised in the table below:

	2030	2050
Climate change targets	50% reduction of CO ₂	Carbon-free railway operations
Energy efficiency targets	30% reduction of energy consumption	50% reduction of energy consumption

Building on these European targets, in 2019 UIC – the International Railway Association – proposed to go one step further by aligning its 2050 CO₂ emissions global target to something that is becoming more and more widely shared as a consensual target to achieve the Paris Agreement: carbon neutrality by 2050 ([Railway Climate Responsibility Pledge](#)).

Railways also address air pollution based on a target of 40% reduction of total PM and NO_x emissions by 2030 compared to a 2005 baseline. By 2050 railways aim for zero-pollution operations.

3. Rail is taking action

European railways commit to improve their energy efficiency and thus contribute to climate goals based on the following actions.

▪ Rail is modernising its infrastructure

Rail infrastructure in Europe is already electrified: Switzerland's railway lines are 100% electrified, while Luxembourg (95%), Belgium (86%), the Netherlands, Sweden, Italy, Austria, Bulgaria, Spain, Poland and Portugal are all above 60%. The largest increases in recent years have taken place in the United Kingdom, Greece, and Poland.

- **Rail is modernising its fleet**

Railway undertakings are continuously investing in energy-efficient modern rolling stock. Due to electrification of the railway network, diesel vehicles are gradually being replaced with electric vehicles and deliver zero direct emissions in rail. Alternatives are also being experimented for the areas where electrification is not economically feasible. The two technologies with railway applications are battery trains (electric vehicles with an electric hybrid battery drive) and hydrogen trains, which draw their energy from fuel cells. These technologies are currently tested in Austria, the Netherlands, Germany and Italy.

At the same time, the existing fleet is being modernised through reconditioning of technical components. For example in Switzerland the state-of-the-art power electronics for the traction system are being used to extend the life of the existing locomotive fleet and at the same time reduce the specific energy consumption by 5%.

Fleet renewal also serves to meet passenger expectations, which continue to evolve. As a consequence, a growing quantity of energy-consuming equipment like air conditioning systems and IT equipment have resulted in a demand increase for non-traction energy, which will only grow further in the future. Regarding the traction energy – the largest part of the energy consumed by rolling stock – reductions could be achieved by eco-driving, which is limited however to guarantee the punctuality required by infrastructure managers and passengers. For the time being punctuality is a superior parameter to energy consumption. That trend could be reversed however by a growing eco-awareness of passengers (e.g. acceptance of a 15-min longer journey or lower indoor temperature in trains during winter in return for additional energy savings). Moreover, there is evidence that shows that eco-driving could lead to smoother speed profiles, also allowing time savings.

- **Rail is procuring green electricity**

CER members are committed to eliminating the use of fossil fuel energy before 2050 and therefore set individual deadlines. Railways are consequently promoting green electricity: for example, since 2018 electric traction is from renewable energies in Austria; in the Netherlands electric trains are already running 100% on wind energy, in Sweden 100% and in Switzerland 90% on hydropower. Renewable energy sources are carefully assessed by railways in various projects. While power purchase agreements are signed, railways also strive for own generation by installing wind power and photovoltaics on the roofs of buildings and stations.

- **Rail is investing in technology**

Railway undertakings often install on-board energy meters to monitor energy consumption and couple it with energy-efficient driver training programmes (see eco-driving above in rail fleet). The goal is to optimise operations and save additional energy. For example since 2014, trains in Switzerland are operated on “green wave” thanks to “adaptive steering”, an IT system to offer the locomotive crew the possibility to select a driving strategy that is adapted to the current operating situation. On-board driving assistance that is based on optimised braking and an automatic engine stop/restart system delivers fuel savings up to 10%. This is why all train drivers in France are currently being trained in this tool.

A recent technical innovation targets the heart of the drive technology: the transformer. Previously, transformers were oil-cooled, but now trains have a dry transformer that in the Swiss setting delivers annual energy savings of 7%.

Railways have put circularity at the heart of climate action. For example in Belgium and Poland, railway operators put into operation a year-round automatic railway cleaning wash, which uses rain and recycled water.

In order to reduce the energy consumption of the railway system and GHG emissions from the network, railways constantly strive for technological development by cooperating with scientific and research centres. Railway undertakings are initiating pilots of driver advisory systems, which allow increased punctuality and traction energy savings, and take steps towards automatic train operations. Finally, railways work on traction vehicles capable of energy recovery thanks to regenerative brakes, which will be very useful for the lines without a catenary.

4. Rail's expectations from the European Climate Pact

The European Climate Pact should steer European transport on a path to full decarbonisation by 2050. A shift to a low- and increasingly zero-carbon transport mode like rail is a cost-effective way to achieve transport decarbonisation.

Railways must be enabled to fully play their role as the backbone of a digitalised and seamless multimodal system in the forthcoming strategy for sustainable and smart mobility in 2020. Indeed the EGD (through the mobility strategy) should lead to actions to shift a substantial part of the 75% of inland freight carried today by road onto rail and inland waterways. The main part of the inland freight volumes should go by green freight. The Rail Freight Forward coalition of European rail freight operators are already working together to increase the EU market share from 17% today to 30% in 2030. Green travel initiatives are needed for long-distance (cross-border and city-to-city) travel up to 1000 km by rail. The Climate Pact should ideally bring all modes of transport and passengers together to further develop more user-friendly and attractive multimodal services. Railways will continue to contribute to the achievement of sustainable door-to-door mobility, including Mobility as a Service with a focus on accommodating green and innovative disruptive technologies.

The European Climate Pact should support these modal shift initiatives by increasing awareness of transport users through standardised carbon footprint reporting and development of eco-labelling for transport services. Moreover, users should be made aware of the lower negative externalities associated to railways compared to trucks and private cars (i.e. accidents, air and noise pollution). Traffic congestion further makes road transport more costly than users think.

- **Eco-label for transport services**

The European Climate Pact should lead to the development of an eco-label to equip travellers and shippers with a Europe-wide harmonised tool that can help them make a well-informed choice for low-carbon mobility. Quick gains in reducing transport GHG emissions could be achieved by triggering behaviour change.

- **Standard methodology on carbon footprint**

The Commission should help align existing carbon footprint approaches, so that a unified methodological framework can be established. EN 16258 is a step in the right direction, but a consistent cross-modal eco-label for transport remains to be developed.

Regarding the railways' pledge (Section 2), the sector has implemented a methodology ([UIC Environment Strategy Reporting System](#)) and collects data on a regular basis since 2007 (stored at <http://www.co2-data.org>).

- **Open dialogue with citizens**

Railway infrastructure managers in their business plans consider the two-way relationship between railway infrastructure and the environment. Their goal is to proceed with projects that preserve biodiversity to support better absorption of GHG emissions. Railway infrastructure projects (upgrading existing and constructing new rail infrastructure) are

essential to promote transport decarbonisation through modal shift to climate-friendly rail thus reducing end user's GHG emissions. The European Climate Pact should ideally facilitate a platform for railway infrastructure managers to clearly communicate the benefit of such projects for climate protection. It is important to accelerate approval for construction or renovation of railway infrastructure to accommodate capacity for modal shift. Users will demand fast, punctual and well-connected transport that requires railway infrastructure investments. As each moving train corresponds to several dozen cars and trucks, this will contribute to avoidance of GHG emissions.

5. Conclusions

Climate action is a collective effort. This is why railways take various actions such as those described in this paper. It has to be noted that railways are heavily dependent on services provided by other entities. Railways therefore support sustainable procurement and invite all partners to cooperate to effectively reduce GHG emissions.

It has to be noted that the EU Green Deal requires significant financial investment. Cost-friendliness of solutions is crucial since environmental awareness alone is not enough to convince potential customers to choose a train over more polluting modes. By redirecting funds (public and private) to help railways become even greener, the end-user costs could be decreased, thus encouraging a shift to rail as the most climate-friendly travel mode and enabling the much needed transport GHG reduction. While the EU and national budgets will be essential in governing this green transition, quick gains could be achieved if indirect subsidies (tax exemptions on kerosene and fuel) are avoided and robust carbon pricing is implemented.

Railways look forward to welcoming new passengers on board their trains and carrying more freight in 2021 to celebrate the European Year of Rail and make the European Climate Pact a driver of clean mobility.

About CER

The Community of European Railway and Infrastructure Companies (CER) brings together railway undertakings, their national associations as well as infrastructure managers and vehicle leasing companies. The membership is made up of long-established bodies, new entrants and both private and public enterprises, representing 71% of the rail network length, 76% of the rail freight business and about 92% of rail passenger operations in EU, EFTA and EU accession countries. CER represents the interests of its members towards EU policy makers and transport stakeholders, advocating rail as the backbone of a competitive and sustainable transport system in Europe. For more information, visit www.cer.be or follow [@CER_railways](https://twitter.com/CER_railways) on Twitter.

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