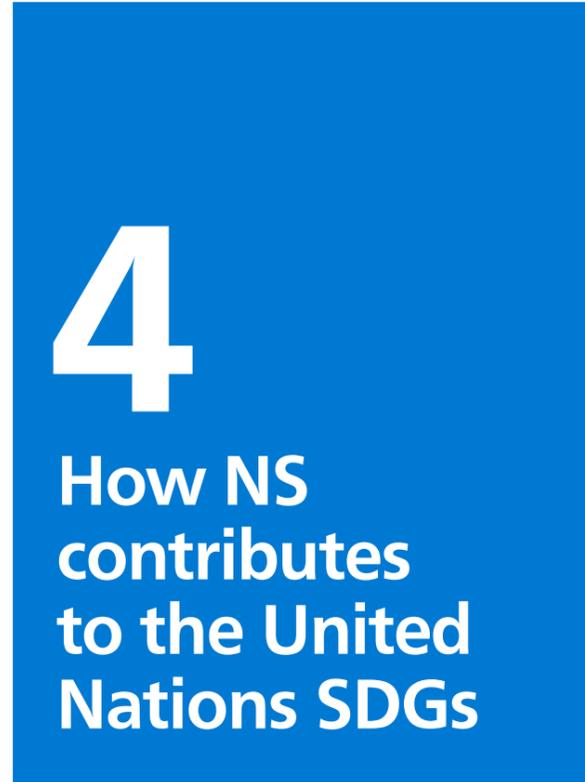


Sustainable future: rail can contribute



Table of content



- 3 A short history of SDGs

- 4 How NS contributes to the UN SDGs

- 5 Our ambition in a nutshell

- 6 Inspirational sustainable examples

- 7 Mobility sector is part of the issue, rail is part of the solution

- 8 The rail sector can achieve a lot when working jointly

- 9 Give wings to international train travel

- 11 Stimulating sustainable innovation

- 14 More information



A short history of Sustainable Development Goals

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development – adopted by world leaders in September 2015 at an historic UN Summit – officially came into force. Over coming years up to 2030, with these new Goals that universally apply to all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

The SDGs build on the success of the Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty. The new Goals are unique in that they call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

How NS contributes to the United Nations SDGs



How NS contributes to the United Nations SDGs

For NS the Sustainable Development Goals (SDGs) are the framework for sustainability initiatives. NS expects to be able to make the difference on seven SDGs in 2030. These seven SDGs are relating to climate neutral, circular and inclusive business management whilst working in partnership. We have chosen these seven goals as these are the areas which fit naturally to the NS way of working, the position NS has in Dutch society and are valuable in our business contacts with partners.



Our ambition in a nutshell

Together we keep the Netherlands accessible

Together

- We work closely with our infrastructure provider, stakeholders, partners and other public transport companies.
- Excellent cooperation internally and within the sector ensures that we operate as one NS.

The Netherlands

We take the social responsibility to contribute to the economic and spatial development of the Netherlands. We are there for the whole of the Netherlands: in the cities, in the region and in connection with other countries. We also want to play a role in the first and last mile of our passengers' journey. NS is a strong Dutch company and we would like to keep it that way.

Accessible

- Mobility: National and regional accessibility, in urban areas and in more rural regions; Not only train but for all modes of transport used by our passengers.
- Accessibility: both physically and digitally. Transparent and barrier-free.
- Affordability: we offer mobility that is affordable for everyone.
- For everyone: We are there for all our passengers (young, old, poor, rich, cities and region) and give them the freedom to use their (travel) time as they see fit. We also do this for the next generation. That is why we work sustainably.

To keep the Netherlands accessible in the future, we focus on broad mobility: exceeding train and also involving (the connection with) other transport modalities. The ever changing wishes of our various passengers are leading. It is our ambition to be the best in the world. We take the lead in development and implementation of mobility solutions in an integrated network. Naturally, we work together with other public transport partners. Important pillars for our success are:

Always nearby:

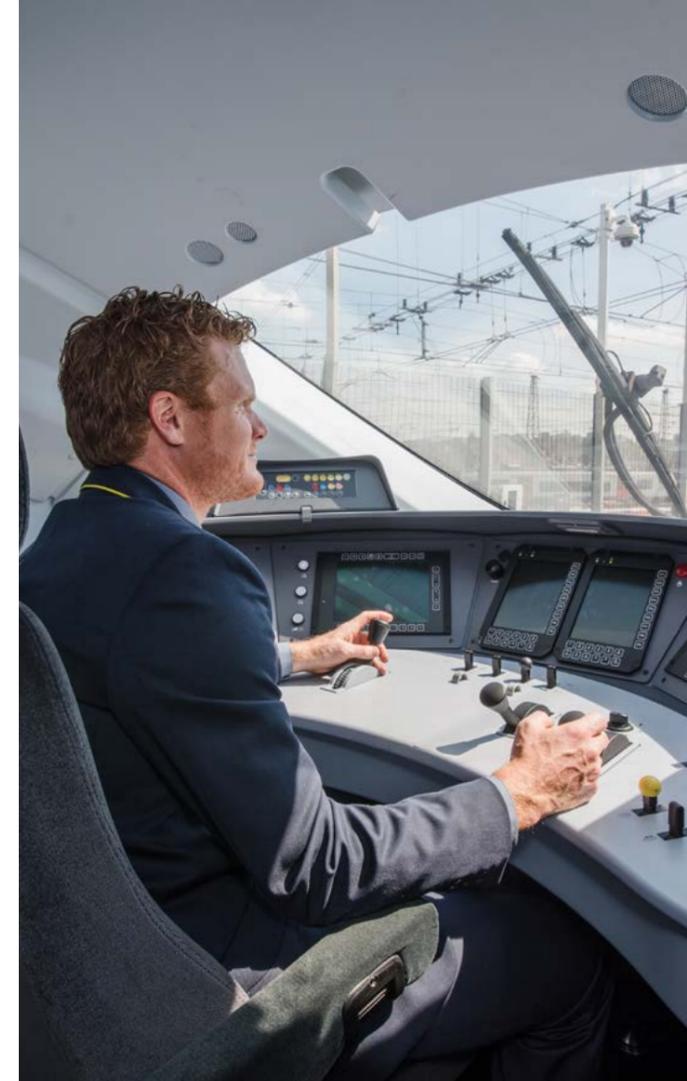
The fastest and smoothest connections throughout the Netherlands, demand-driven and flexible, for everyone with our stations as the beating heart. Both (inter) national and regional. We also focus on the first and last mile of our passengers' journey. An all-in-one offer thanks to the best mobility app in the Netherlands, which always takes care of you personally.

Always affordable

The right price through efficient management.

Always sustainable

We are a significant force of urban- and economical developments because of our rail network and stations. We are the leader in sustainable mobility and take the responsibility upon us to realise and facilitate sustainable mobility with our partners.



How we do this?

[See our inspirational examples](#) >



Inspirational sustainable examples

NS implemented various initiatives contributing positive to environment and society

NS contributes to the entire domain of corporate social responsibility and thus limiting negative impact on the environment and society. Spread over four themes, the coming pages describe various examples implemented by NS Dutch Railways. Interested in our way of working? Please contact us.



Mobility sector is part of the issue, rail is part of the solution

Internationalisation, European unification, our freedom of movement across Europe: the world around us is changing at high speed. We Europeans are now more mobile than ever before. More and more across Europe, borders are seemingly fading, seamless travel across Europe and across the globe is a reality for millions of passengers a year. This increased mobility comes with a price as mobility will always have an impact on environment.

What is the impact?

What you see in Fig 1 is the share of CO₂ emission by transport sector. The vast majority of CO₂ emission is caused by road transport and secondly aviation (table 3). Stimulating train travel will help to reach the goal to

reduce CO₂ emission. Therefore it is worthwhile to persuade both the car user and the airline passenger to switch to train travel. The train should be the first choice of travel for short international journeys. It protects our environment and it stimulates our economy.

If the train is to become a serious competitor to air travel for trips up to 700 kilometres, we have our work cut out for us. It requires a combination of higher frequencies, more destinations, more capacity, shorter travel times, competitive prices and a positive stimulus on sustainable innovation in the rail sector on a whole. To achieve this and thus enhance train travel, far-reaching cooperation between railway companies, infrastructure managers and governments is required.

Fig 1: Share of CO₂ emissions from fuel combustion by sector in Europe

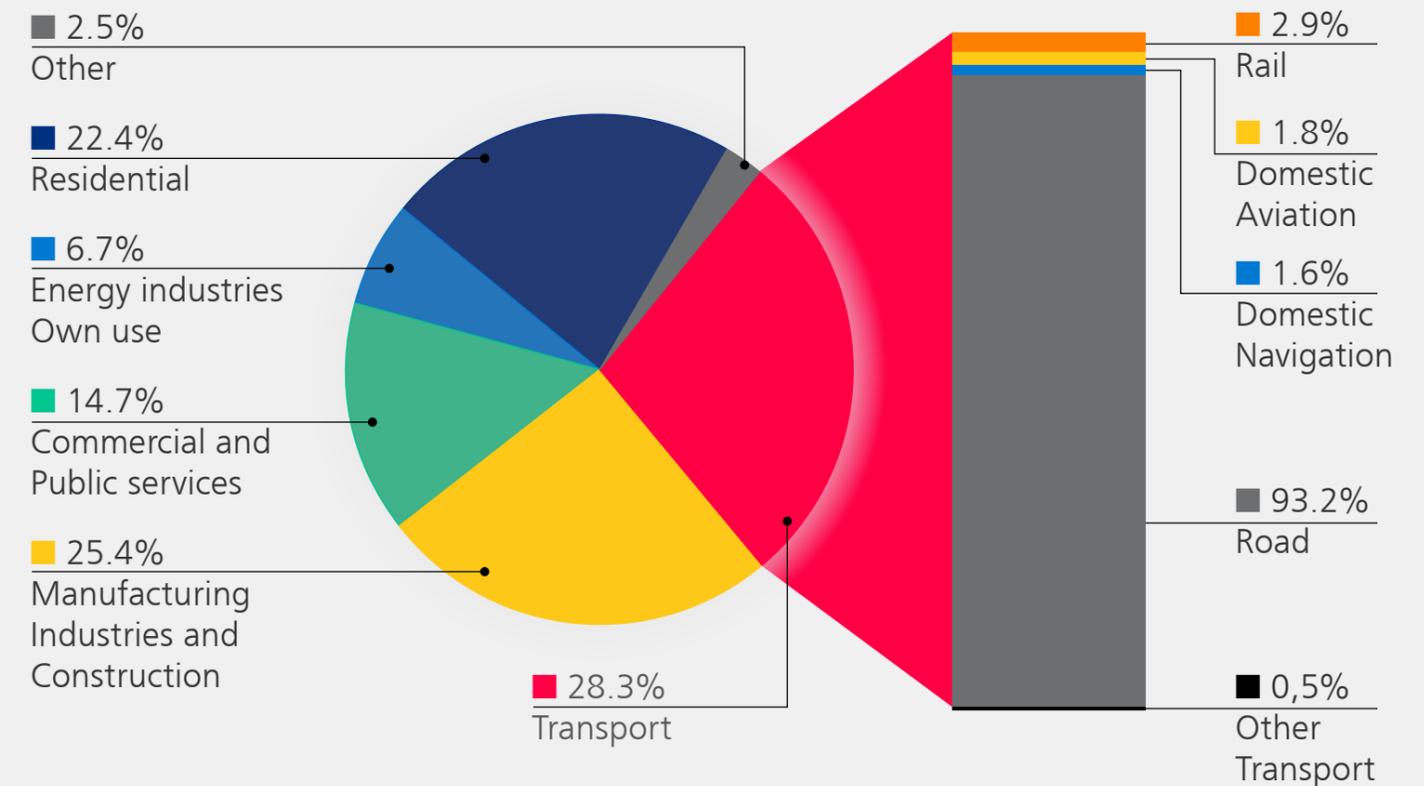


Fig 2: Rail is **9x less CO₂ intensive** than road for air travel passengers



The rail sector can achieve a lot when working jointly

And the EU can facilitate

We identify four specific topics which contribute to a more sustainable future and help directly to achieve the seven SDGs.



Give wings to international train travel



1. Create level playing field
2. Investment in infrastructure



Stimulate sustainable innovation



3. Stimulating energy efficiency
4. Stimulating circular economy



Give wings to international train travel

1: Level playing field

Strengthen level playing field between train and air travel

If the train is to become a serious competitor to air travel for journeys up to 700 kilometres, a level playing field between these modes of transport is required. EU can help create this level playing field. Train travel in the Netherlands is currently taxed at 9% VAT and we pay infrastructure levies to the infrastructure managers. Flight tickets on the other hand, enjoy a 0% VAT charge and kerosene remains untaxed.

Stimulating sustainable innovation

To make international travel by train more appealing within Europe action is needed. The Netherlands, as a country with ambitions for sustainability and accessibility, can play a leading role in these ambitions, by co-investing in cross border infrastructures and pushing for technical standardization and stimulate sustainable innovation.

What can we do as European rail sector?

As a sector, we need to move towards international standards, for example sales and ticketing systems. Railway operators are inclined to use their own system which is often difficult for distributors to access and to integrate. Same applies for ticketing conditions which vary from company to company. As a sector, we should make this easier for the benefit of our passenger.

Would you like to learn more about our Capital to Capital vision? [Download here our magazine.](#)

This is how Europe taxes train travel VAT on international train tickets

● Exempt

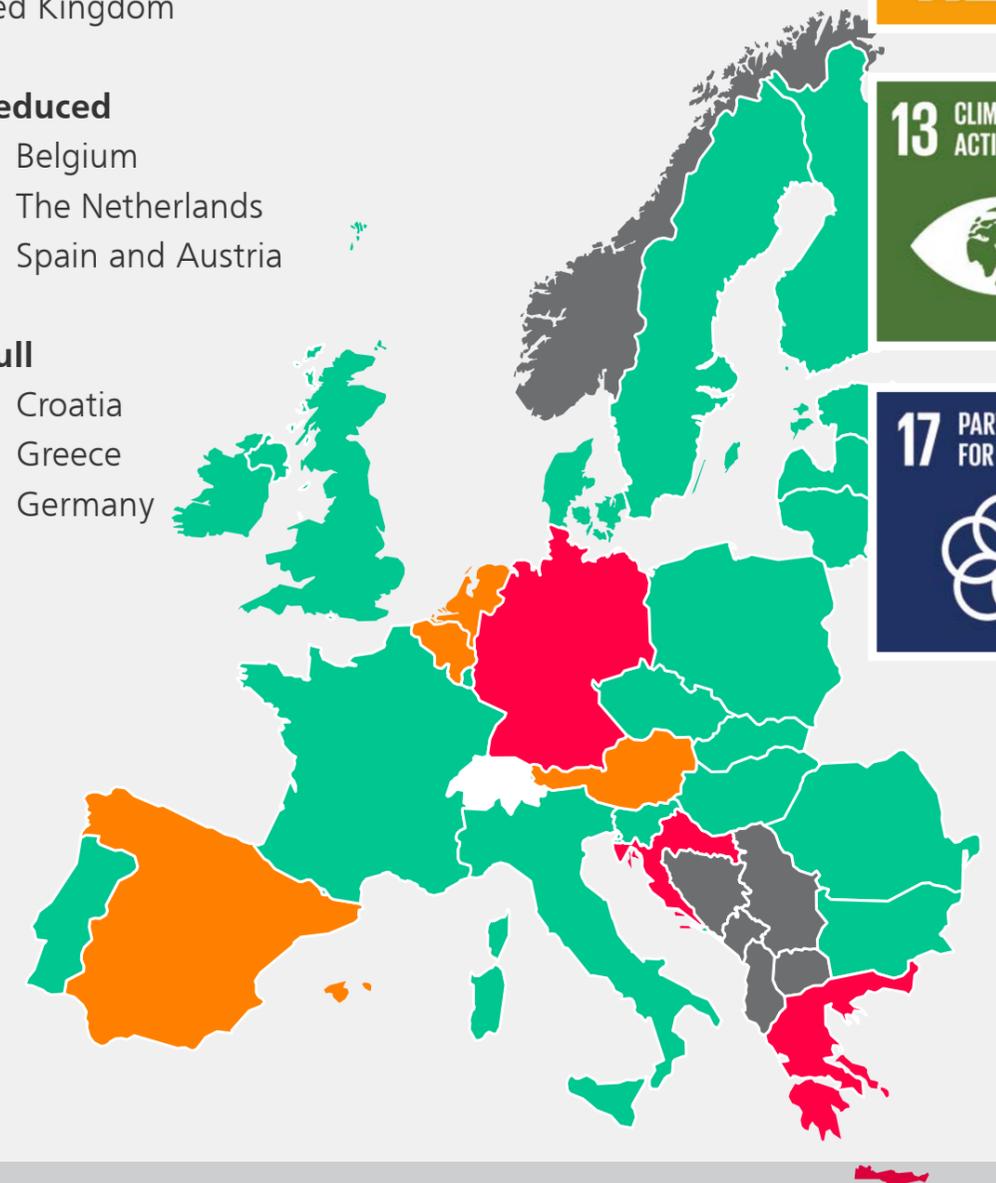
Bulgaria, Denmark, Estonia, Finland, France, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Sweden, Slovakia, Slovenia, Czech Republic, Hungary, United Kingdom

● Reduced

6% Belgium
9% The Netherlands
10% Spain and Austria

● Full

25% Croatia
24% Greece
19% Germany



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS



The rail sector can achieve a lot when working jointly



2: Investment in infrastructure



Give wings to international train travel

2: Investment in infrastructure

How can Brussels contribute?

Action list:

- Enhancements in infrastructure to solve bottlenecks
- Technical standardisation is needed, a.o. for safety systems and electrification
- In Europe, VAT and infra levies for train travel needs to lower

This requires intensive cooperation of train operating companies, infrastructure managers and national – and European Governments together with a strong, dedicated focus on international rail network.

The European Commission is looking to speed up the expansion of high-speed train network in Europe, a great step we fully cheer. In doing so, European Commissioner Violeta Bulc aims to reduce air pollution, relieve traffic in sky and on roads, and align the unfair competition between rail and air traffic. Brussels is currently drawing up plans to this end, which includes investigating the tax benefits that air traffic currently enjoys. Conclusions and recommendations are expected in 2019. We eagerly await the results of these studies.

Investing in trains cuts CO₂ emission in half

Today the plane still takes the number one spot for travel to most European destination, including relatively short trips. With faster connections and better service, consultancy Royal Haskoning DHV has calculated that the modal share of train between 31 European destinations can increase from 27% to upwards 63% on average. The potential environmental benefit is immense: 998 million kg less CO₂ emissions, a substantial portion of the total objective to reduce transport emission and reason in itself enough to commit to making it reality.

Sustained investment, implementation of international standards and unified international cooperation on all fronts will reduce CO₂ emission caused by transport on the studied routes by more than half. The amount of particulate matter NO_x released into the air is also dramatically reduced: by 13% if major barriers are eliminated and by 37% with a European high-speed network.

[Back to 1: Level playing field](#)



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS



Stimulating sustainable innovation

If we are serious about simulating sustainable innovation in the rail sector, we should enhance current legislations and regulations. In concessions and tenders, price is often a decisive factor. Parties, inspired by the United Nations SDG's, actively working to reduce their negative impact, risk losing a contract because they end up to be more expensive than parties who do not innovate nor take any initiative in that area. In addition and on top, current standards are not mandatory for the sector.

The EU in its role as regulator can force a break through:

- Set minimum requirements for concession providers or manufacturers. For example, by requiring a number of sustainable aspects as a minimum requirement for bidders of a concession or tender.
- Ensure that parties that compete can earn points if they perform better than the minimum requirement. Sustainable innovation is rewarded in this way.
- Ensure that offers from tenderers can be objectively compared with each other via standards.

The tender for climate-neutral rail replacement bus transport that NS has completed this year in the Netherlands shows that in this way the tenderers are encouraged to become more sustainable.

This approach is applicable for various topics, like:

- stimulating energy efficiency
- stimulating circular economy

Topic 1: stimulating energy efficiency



Topic 2: stimulating circular economy



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS



Stimulating sustainable innovation

1: Stimulating energy efficiency

The EU can make sure that all concession providers stimulate energy efficiency. An existing standard that describes the maximum energy consumption per passenger kilometer can be included as a minimum requirement in a concession. This can be achieved by anchoring this standard, UIC code 330, in existing standards for trains, Technical Specification for Interoperability (TSI).

If tenderers are more energy efficient than the minimum standard, they earn points. This could be a requirement for concession providers. It is already possible to compare offers of tenderers objectively to energy efficiency. This is possible with the EN 50591 standard.

Another or additional possibility is to request tenderers to report the total energy consumption during the

entire lifecycle of their trains. The scope of which can later be extended to take the building process and demolition into account as well. Namely on the total energy consumption during the entire life cycle of equipment. 'Energy consumption as a result of construction and demolition' could be added over time.

The EU could stimulate even further by setting higher targets for energy efficiency over time. The EU could also indicate when the existing standard that describes a maximum energy consumption per passenger kilometer (UIC code 330) is being adjusted or replaced. This will show how the standard will be increased step by step, taking into account the pace of innovations.

[Back to Stimulating sustainable innovation](#)



[Topic 2: stimulating circular economy](#)



7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



17 PARTNERSHIPS FOR THE GOALS



Stimulating sustainable innovation

2: Stimulating circular economy

The introduction of a raw materials passport for manufacturers facilitates maintenance companies to reuse train components. Such a passport makes it clear which materials are used for which component in order to facilitate reuse. The EU can standardize what needs to be included in the passport and link it to the existing standardization of the components.

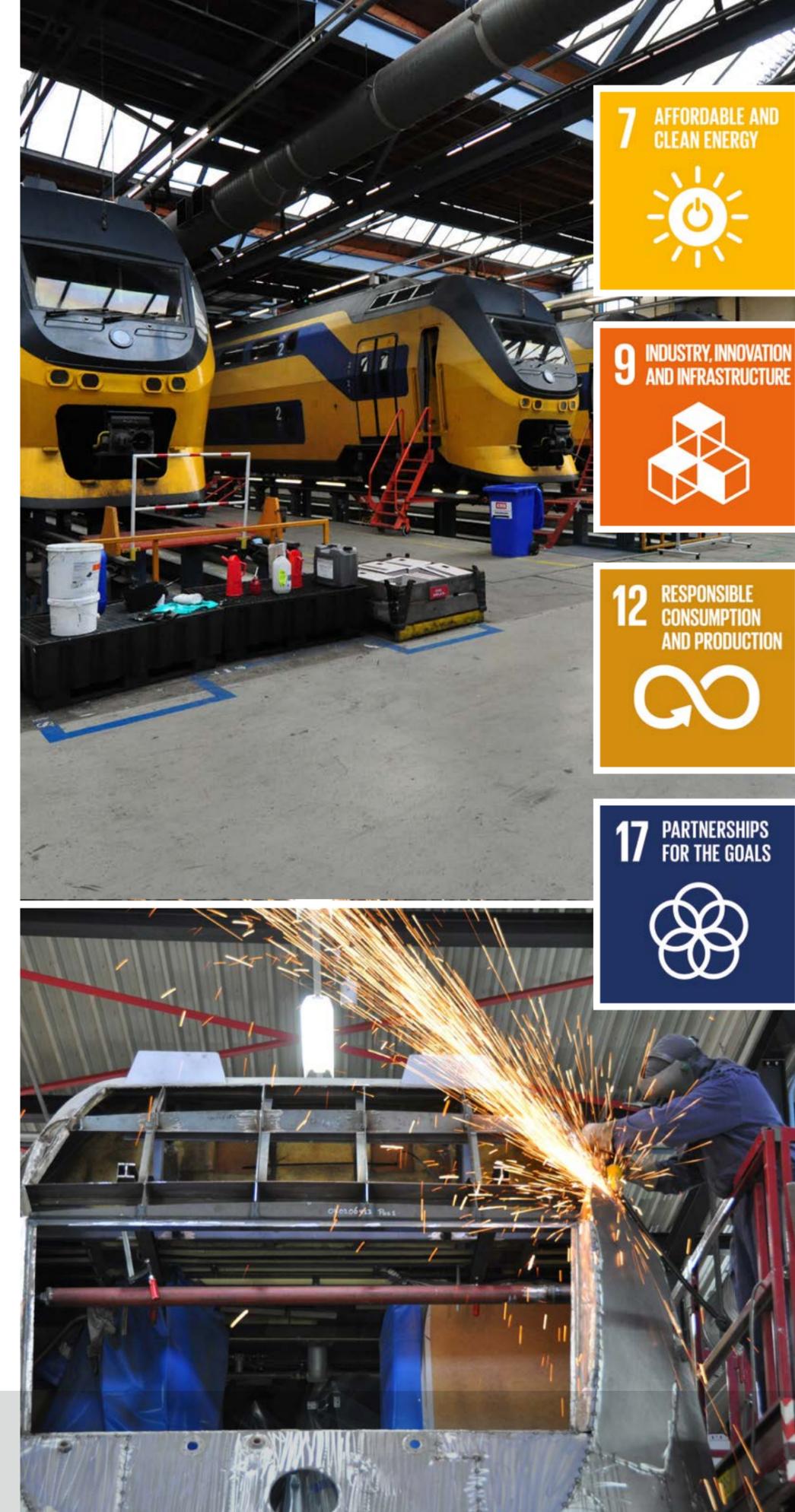
The EU can then decide over time what the minimum recycling percentage should be. When it becomes clear what the required growth path is, manufacturers know which challenges come to them at what time.

After all, an objective measurement of recycling by suppliers enables a fair comparison. The EU can determine how the recycling rate should be objectively determined. For example, based on weight or on the basis of number of components.

[Back to Stimulating sustainable innovation](#)



[Topic 1: stimulating energy efficiency](#)



7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



17 PARTNERSHIPS FOR THE GOALS



More information

We hope this white paper has informed you on our vision, strategy, implemented examples and ideas for a sustainable future in which rail plays a crucial role.

Would you like to know more about our way of working, please contact

Carola de Jonge

European Affairs Manager

Carola.dejonge@ns.nl



Climate neutral

Energy efficient driving by our train operating staff

Our train drivers and train managers play a crucial role when it comes to efficient usage of energy. To stimulate energy efficient driving, NS introduced a program a couple of years ago. Depart on time, smooth acceleration, and prolonging the roll out leads to a significant saving of energy. When trains are parked, they are completely switched off. To realise this we call upon the craftsmanship of our employees. In recent years the energy consumption per passenger kilometer has improved by more than 25% compared to 2005.

Climate neutral rail replacement buses

As of 2019, the buses operated by NS for rail replacement will run on Hydrotreated Vegetable Oil (HVO) generated from waste and industrial fatties like frying fat. This type of HVO is considered climate neutral. We see usage of the HVO fuel as an important step towards completely emission free bus transport.

100% wind energy, 0% emission

NS is one of the largest energy consumers in the Netherlands. Travelling with NS trains causes zero CO₂ emission, since 2017. The electricity needed for trains is generated from new sources: newly built wind farms in the Netherlands, Belgium and Scandinavia. NS no longer operates trains fueled by diesel.

Watch the video



Back to our examples



7 AFFORDABLE AND CLEAN ENERGY



13 CLIMATE ACTION



Working in partnership

Coalition 'Anders Reizen'

As for mobility it is clear that employers have a direct and indirect influence on more than 56% of kilometres travelled by road. Each with their own specific mobility policy for business travel and commuter traffic, employers have a direct influence on travel behaviour of their employees. A large group of employers have initiated the Coalition Anders Reizen.

The 45 participating organizations, varying from ABN AMRO to VodafoneZiggo and from Royal Schiphol Group to Shell, have committed themselves to half their joint CO₂ emission for business travel and commuter traffic by 2030. Jointly they represent 300,000 employees in the Netherlands.

Coalition Anders Reizen

10 most successful implementations

- Implement restrictive parking policy
- Promote environmentally friendly leased cars
- Implement personal mobility budget with a bonus malus system
- A public transport travel card for all employees with leased cars
- Offices near public transport junctions

- Offer free public transport travel for business travel and private travel to all employees with a privately owned car
- Offer new employees only a public transport travel card for their first 3 months of employment
- Choose train over airplane for distances <700km
- Promote working from home and office sharing
- Initiate a behavioural campaign/game

Over 4 Megaton CO₂ can be reduced by scaling-up these policies to the remainder of the employers in the Netherlands. This can be achieved partly through working together and stimulate others through illustrating positive examples and results. Joint action helps, accelerates and reinforces, but results can be achieved even quicker when the above policies are safeguarded through fiscal incentives or to make them integral part of government policies. By up-scaling we reduce social costs, enhance the climate, air quality (NO_x and particulate matter), noise pollution in cities, the overall health of employees and last but not least we keep the country connected.

[Back to our examples](#)



Circular economy

Waste reduction

NS promotes waste reduction in many different ways. As an example, we ask our passengers to deposit their newspaper in the designated area after reading. As a result less newspapers need to be printed because one paper is now read by more than one passenger. Another example is the discount of 25 eurocents when passenger bring their own tea- or coffee cup, which saves cups. Also, NS is in the process of installing 200 water tap points at stations for passengers to (re)fill their water bottle. Installing 200 water tap points will ensure that 90% of our passengers in the Netherlands will come across a tap point on its journey. Refilling your own bottle reduces plastic production. It is our objective for 2020 to recycle 80% of the generated waste.

Double decker trains' second life

For the past 20 years, the NS Dutch railways' double decker trains were their work horses, 416 carriages, each weighing 60,000 kilos. Now it is time to replace them, but what to do with this fleet? Recycle the parts and use them to modernise the remainder of the NS fleet.

416 carriages create a wealth of raw materials for NS to use to modernise other trains. 96% is being reused. Thus making it possible to extend the lifecycle of these trains by 20 years at a lower cost, whilst at the same time being sustainable and without requiring any subsidies.

[Back to our examples](#)



[More details](#)



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Circular economy

Second life, recycle and upcycle

NS gives a second life to its double-deck trains through modernization. In total 96% is being reused. Some parts like doors, screens and dashboards can be reused in other double decker trains. Other parts – like the electrics – can be used in any model of train. In total this amounts to 86%. Not all materials can be reused for trains. Ten percent of every train is recycled in other products. For example, the rubber around train windows is recycled for reuse as rubber tiles for playgrounds. The NS also supplies its used raw materials for upcycling into household products – such as bags made from seat upholstery.

By the end of its modernisation project, almost 24 million kilos of materials will have been salvaged from scrap and reused, kept as valuable materials in the cycle. Besides the double decker trains, there are many other train models ready to be phased out and reused. Ultimately, it is our objective to recycle 100% of its parts.

It is not just train parts that can be reused, recycled or upcycled. These techniques can also be applied to other transport vehicles – like busses, airplanes and metros. The whole transport sector could help to expand the circular economy concept across the world.

[Back to circular economy](#)



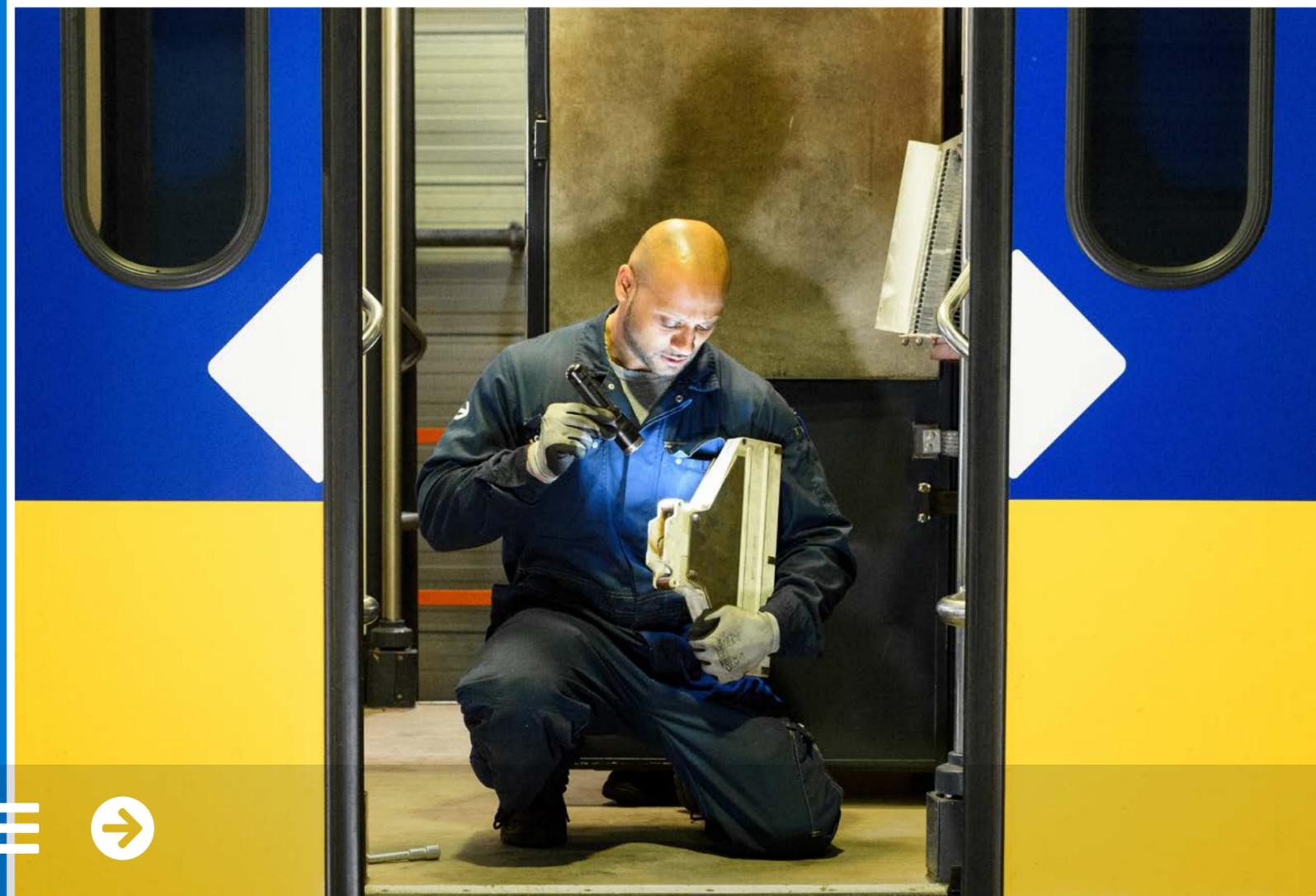
[Watch the video](#)



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Diversity & social inclusion

Accessibility of trains for everyone

NS offers services and facilities which support the train journey and the time spent at stations. A journey with no physical and emotional barriers is the wish of all our passengers, with or without disability. It is the ambition of NS to offer equal, comparable travel options for our passengers, autonomous where possible and with assistance when needed. Almost all enhancements are brought forward by the target audience

Accessibility is a fixed part of our design processes. This requires integral attention: from travel information to ticketing, from train to station. It is essential to involve the target audience in early stages of enhancements and new developments. Accessibility is not implemented overnight. That is why it is crucial that simple issues are solved at once. These bottlenecks are identified during fruitful dialogue session with interest groups. This leads to measurable achievements leading to a more accessible train journey.

[Back to other examples](#)



[Watch the video](#)



8 DECENT WORK AND ECONOMIC GROWTH

