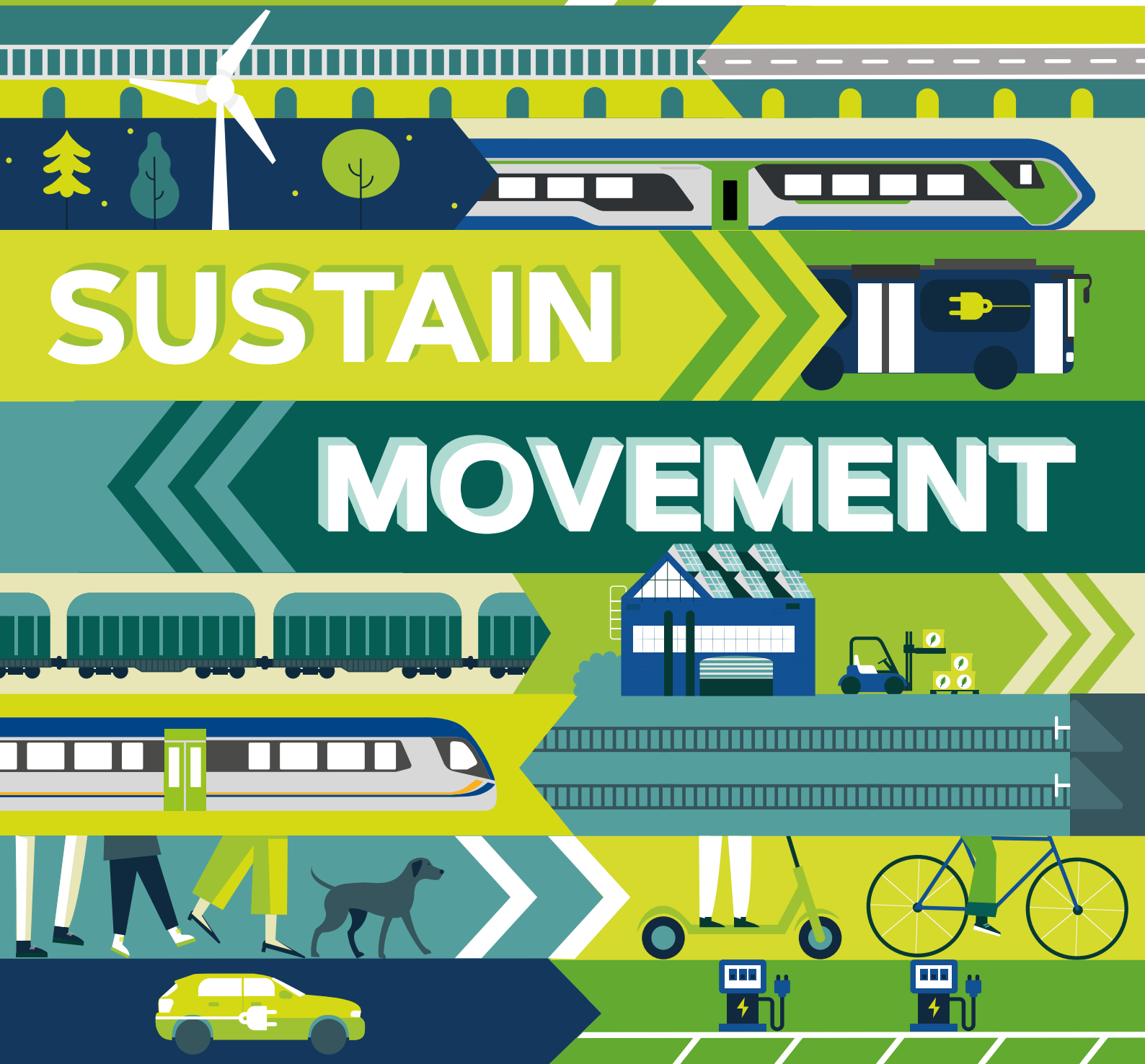
# GHG REPORT 2021

FERROVIE DELLO STATO ITALIANE



# SUSTAIN MOVEMENT

## GHG REPORT 2021

GREENHOUSE GASSES EMISSIONS REPORT

# SUSTAIN MOVEMENT

**THE GHG REPORT IS AN IN-DEPTH STUDY OF THE MANAGEMENT BY THE FS GROUP OF MATTERS RELATED TO ENERGY AND GREENHOUSE GAS EMISSIONS. THIS DOCUMENT SHOWS THE APPROACH, STRATEGIES, CURRENT AND FUTURE PROJECTS AND PERFORMANCES THAT HAVE CHARACTERISED THE OPERATIONS IN 2021.**

Information that is hereby presented is the result of a reporting process which flows into the annual Sustainability Report, and is developed starting from the Climate Change Carbon Disclosure Project (CDP). With the GHG report we want to show our commitment to facilitate decarbonisation and to mitigate risks caused by climate change.



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**GHG REPORT 2021**

PROJECTS

PERFORMANCE

# OUR METHODOLOGICAL APPROACH

## EVERY YEAR WE CARRY OUT A CAREFUL ANALYSIS OF GREENHOUSE GASSES (GHG) IN CONCORDANCE WITH THE MAIN POINTS OF REFERENCE IN THE SECTOR

Emissions reporting is carried out in accordance with GHG Protocol guidelines defined by the World Resource Institute (WRI) and with the World Business Council for Sustainable Development (WBCSD) and involves the creation of a list of greenhouse gasses, which is updated every year. Moreover, reporting takes into account recommendations of the Climate Related Financial Disclosure Task Force (TCFD) and of the European Commission on climate reporting.
For what concerns environmental data, we define our organizational scope according to the line-by-line consolidation method (2021 Annual Report). Such scope is updated every year, in addition to the Parent company, it also includes other consolidated companies on which we have direct control (excluding businesses that carry out financial activities or that perform audits in the railway transport sector, the impact of which is immaterial) and the consolidated companies that the Parent controls indirectly through its subsidiaries, that have more than 100 employees.

This report has been written in compliance with the Global Reporting Initiative (GRI) and we present the results every year in the Sustainability Report and in the Non-financial Statement.
Referring in particular to our inventory of greenhouse gasses, we measure Scope 1 direct emissions, Scope 2 and Scope 3 indirect emissions in accordance with international guidelines of the GHG Protocol. The conversion factors used refer to year "n-2" of the report, referring to the most recent data available in literature.
For what concerns Scope 1 emissions, the report does not include those related to HFC losses and SF6 (insulating electric oil), because they are estimated not to have a significant impact in terms of energy consumption emissions.
For what concerns Scope 2, the report presents emissions both according to the location-based approach and the market-based approach.

The application of the market-based method cannot ignore the fact that, currently, on the Italian Railway Network managed by Rete Ferroviaria Italiana, the regulatory mechanism determines that the network manager is not allowed to purchase guarantee of origin certificates, with the consequence that GHG emissions related to railway electric traction on the infrastructure operated by RFI are always estimated using the National Production Coefficient.
For what concerns Scope 3 emissions, we carried out an analysis of the emissions accounting for the rest of the value chain. This analysis identified four significant categories of emissions related to the supply chain (purchased goods and services, and capital and consumption goods), emissions related to third-party railway operators that travel on the RFI network and to upstream processes of energy procurement.
Such emissions account approximately for 99% of the total estimated emissions in Group 3.

*For further information on location-based and market-based approaches see Green Focus p. 37*

## 2021 REPORTING SCOPE

FERROVIE DELLO STATO ITALIANE

### TRANSPORTATION

TRENITALIA – GRUPPO FERROVIE DELLO STATO ITALIANE
- TrainOSE SA
- Netinera group
- Trenitalia c2c Limited
- Trenitalia France

BUSITALIA – GRUPPO FERROVIE DELLO STATO ITALIANE
- Busitalia - Veneto
- Busitalia - Campania
- Ataf Gestioni
- Qbuzz

FERROVIE DEL SUD EST – GRUPPO FERROVIE DELLO STATO ITALIANE

MERCITALIA LOGISTICS – GRUPPO FERROVIE DELLO STATO ITALIANE
- Mercitalia Rail Srl
- Mercitalia Shunting & Terminal Srl
- TX Logistik AG

### INFRASTRUCTURE

RFI RETE FERROVIARIA ITALIANA – GRUPPO FERROVIE DELLO STATO ITALIANE
- Terminali Italia Srl
- Bluferries Srl
- Blu Jet Srl
- Grandi Stazioni Rail Spa

anas – GRUPPO FS ITALIANE

### REAL ESTATE SERVICES

SISTEMI URBANI – GRUPPO FERROVIE DELLO STATO ITALIANE

### OTHER SERVICES

FERSERVIZI – GRUPPO FERROVIE DELLO STATO ITALIANE

ITALFERR – GRUPPO FERROVIE DELLO STATO ITALIANE

*Scope of the environmental data: environmental data refer to the Parent, the consolidated companies that the Parent controls directly (excluding companies that carry out financial activities or that perform audits in the railway transport sector, the impact of which is immaterial) and the consolidated companies that the Parent controls indirectly through its subsidiaries which have more than 100 employees. (See 2021 GRI content index Sustainability Report)*

### Sources of energy and emissions conversion factors

| SCOPE | DESCRIPTION | SOURCES |
|---|---|---|
| Scope 1 | Emissions directly generated by the operations of the organization | - IPCC guidelines for national greenhouse gasses inventories, 2006<br>- Energy Statistics Manual (IEA, 2005)<br>- National Inventory Report - Italian Greenhouse Gas Inventory 1990-2019 (ISPRA 2021)<br>- DEFRA UK - Conversion factors 2019-2018-2017, UNI 16258 (2013) |
| Scope 2 | Emissions indirectly generated by the company running | - IPCC guidelines for national greenhouse gasses inventories, 2006<br>- Fiche 330 (UIC, 2008)<br>a) *Location-based*: SINAnet (ISPRA, 2019)<br>b) *Market-based*: European Residual Mixes (AIB, 2017-2018-2019) |
| Scope 3 | Emissions indirectly generated by stakeholders related to company's operations | - Emission factors used for Scope 1 and 2 emission report<br>- UNI 16258<br>- MIMS. Railway works: guidelines to evaluate investments according to sustainability criteria (2021)<br>- JEC Well-To-Wheels report v5 |

# OUR GOALS

WE AIM AT REACHING CARBON NEUTRALITY BY 2040, THANKS TO THE LAUNCH OF OUR 2022 2031 INDUSTRIAL PLAN, A LIST OF CONCRETE, FEASIBLE INITIATIVES, FOR A STEADY AND QUICK DECARBONISATION.

For this reason, we have defined a mid-term goal: reducing $CO_2$ emissions by 50% by the end of 2030. Goal that we can reach through a series of initiatives designed to speed up this process, such as building solar panel plants all over Italy, replacing the fleets, electrifying the network, using renewable energy, phasing out fossil fuels.

**Incentivising goal**

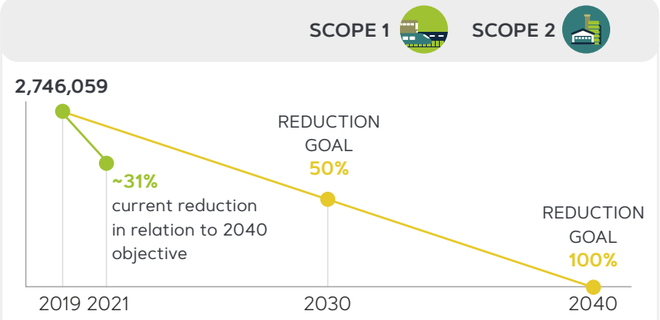
**+ 4% on 2020**

Ratio between the economic value that is generated / $CO_2$ that is emitted.

**+ 13.7%**

Target achieved

SCOPE 1 SCOPE 2




* Location-based approach

**Modal shift objective**

**+ 15% by2050**

Passenger traffic

**Modal shift objective**

**50% – 50% by 2050**

Freight traffic distribution between railway and road, for journeys longer than 300 km

## > WE SIGNED THE EUROPEAN RAILWAY AGREEMENT

On the 22nd of February 2022, signing the European Railway Pact together with 33 European companies, we committed to transforming the railway infrastructure into a benchmark for sustainable transport, in all of its aspects, from attention to the environment to energy transition.

According to the Railway Pact, the objective of neutralising GHG emissions by 2050 will be reached through:

* A more energy-efficient use of our assets (eco-driving, onboard electricity meters, energy consumption reduction during commercial stops or in standstill, investment in even more sustainable rolling stock, Digital Capacity Management, Digital Automatic Coupling);
* Further greening of our electricity mix;
* Complete decarbonisation of railway operations by completing further electrification or with investments in alternative propulsion technologies such as battery, hybrid, hydrogen or biofuel trains when electrification is too costly.

## >> MODAL SHIFT SOLUTIONS FOR A NEW MOBILITY

One of our main goals is the promotion of politics and modal shift solutions in a sustainable way, for transportation of both people and goods, paying particular attention to collective mobility solutions. These are actions that can contribute to a great reduction of $CO_2$ emissions in the sector.

Therefore, we have started activities for the mitigation of climate change, such as:

- Extending the high-speed railway network, building 1,084 km of new lines, aiming at shortening distances for the most suburban areas in Italy;
- Developing connections between the railway network and different transport hubs, such as 14 airports, 12 ports and 11 freight terminals integrated with the railway network;
- The Integrated Stations Plan for the transformation of passengers terminals into intermodal, appealing hubs, includes 483 redevelopment works aimed at improving accessibility and intermodality and 21 redevelopment works on hubs of underground lines;
- Conversion of approximately 800 kilometres of railway lines into tourist use;
- Development of a digital platform for freight rail transport: building an European digital ecosystem, that can facilitate data exchange between different European freight rail transport operators;
- Introduction of new vehicles to the fleet of trains, buses and ships that guarantee an overall improvement in terms of comfort, technological innovation, onboard connectivity and sustainability;
- The Gigabitrail project, to connect the National railway infrastructure to the mobile network;
- The development of road-railway plans, to promote modal integration solutions (including digital solutions in views of the MaaS - mobility as a service for Italy).

# OUR GOVERNANCE

WE BUILT A NEW GOVERNANCE MODEL THAT TAKES INTO ACCOUNT NEW COMPANY NEEDS, INTEGRATED WITH PRINCIPLES OF ENVIRONMENTAL, SOCIAL AND FINANCIAL SUSTAINABILITY

The Sustainability Governance Model, responsibility of the Board of Director, defines governance and draws up managements processes, in order to ensure that sustainable development procedures are carried out with integrity within our company.

The environmental component, especially in relation to climate change, represents a relevant element in the sustainability impact of our Group, taking on a significant role in the evaluation of business choices.

## >> CLIMATE CHANGES ACCORDING TO THE SUSTAINABILITY GOVERNANCE MODEL

### Board of directors
Determines the strategic direction of the Group and supervises the fulfilment of the business vision. In 2021 the Board of directors approved the annual policy of Management by Objectives (MBO), which entails the evaluation of the performance by analysing the ratio between the economic value that is generated and the $CO_2$ that is produced.

### Strategy & Sustainability
It ensures the definition of the strategies of the FS Group and their planning, monitoring and strategic control processes. It is the role that defines the sustainability strategy through consolidation and monitoring of each objective and goal, it defines criteria and ways to develop internal and external factors analysis, and the Stakeholder Engagement process, it presents a proposal for a Group Sustainability Policy to the Sustainability Committee, and aggregates data provided by relevant parties and companies to draft the Sustainability Report.

### CEO
Has the duty to evaluate proposals of improvement to the Sustainability Governance Model (SGM) that can be submitted to the Board of Directors. Moreover, as President of the Sustainability Committee, the CEO approves all the aspects related to the sustainability of the FS Group, from political vision and gap analysis results to goals, sustainability achievements, and data reporting of the Group.

### Sustainability Committee
Is a consultation body established in 2016, that guarantees integration of social aspects and financial and environmental strategies of the Group, and promotes principles and values of sustainable development, in order to generate value for all the stakeholders.

OTHER ACTORS

### *Green Bond Committee*
Puts into practice, upgrades and updates, whenever needed, the Green Bond Framework, identifying and evaluating admissible green projects, developing relative reporting and management projects for any profits generated by bonds.

### *Program Team for adaptation initiatives to face risks caused by climate change.*
It monitors and evaluates solutions, and reports on the financial impact caused by climate risks that might affect the FS Group.

**Board of Directors** → **Control, Risk and Sustainability Committee**

**CEO Chief executive officer**

**Chief Strategy, Sustainability** → **Sustainability Committee**

- RFI
- Trenitalia
- Mercitalia Logistics
- Busitalia - Sita Nord
- Anas
- Italferr
- Ferservizi
- FS Chief Officer


# TRANSITIONING PLAN FOR THE PROTECTION OF THE PLANET

WE ACCEPTED THE CHALLENGE OF DRASTICALLY REDUCING THE $CO_2$ EMISSIONS IN THE TRANSPORTS SECTOR, TO CONTRIBUTE TO THE FIGHT AGAINST GLOBAL WARMING.

## >> TRANSITION SCENARIOS

Our commitment to lead the company towards a new energy era, that aims at the neutralization of greenhouse gas emissions, goes through the achievement of mid-term objectives and ambitious but feasible strategies:

- in 2015 the l'Union Internationale des Chemins de Fer (UIC), asked the transportation sector - including our group - to commit to the Low Carbon Rail Transport Challenge, aiming at reducing GHG emissions and improving energy efficiency of transportation methods;
- meeting the goals set by the International Energy Agency (IEA) we aim at becoming a benchmark for other companies in terms of the 2 Degrees Scenario Mission, a commitment to raise the temperature of no more than 2 degrees over the pre-industrial era for the global temperature by the year 2100. We take on the challenge, by setting two long-term goals: to speed up our path towards carbon neutrality and to incentivise the use of sustainable mobility for both passengers and freight;
- FS Business plan presented in 2022 intends to bring forward the goal - which was initially set to 2050 - of making our company free from $CO_2$ emissions by 2040. The plan wants to create new synergy amongst the parties that populate the entire FS Group, towards a vision of virtuous integration of railway and road transport, both in terms of infrastructures and services. We aim at extending electrified railway lines of over 2,000 kilometres in the next ten years and, whenever it isn't possible, using hybrid, new-generation trains that combine electric power, batteries and diesel. We are studying a transition path towards the exclusive use of electricity generated by renewable sources and new hydrogen mobility solutions. With these innovative solutions we aim at reducing Scope 1 and Scope 2 emissions by 50% and Scope 3 emission by 30% before 2030;
- through risk management, we have developed seamless synergistic methods transversal to the different businesses in the Group. We constantly monitor climate changes with an analysis based on the Representative Concentration Pathway (RCP).



## >> CLIMATE CHANGE AND THE FINANCIAL TOOLS

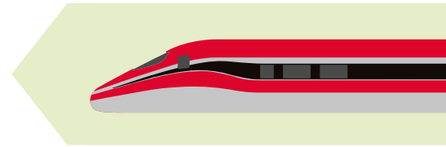
We strongly believe in public transport and railway mobility as concrete foundation to fight climate change, considering the lower intensity of carbon dioxide emitted by these modes of transport.

Therefore, we have developed an investment plan to renew the fleet of trains for freights and passengers, both for high speed and regional journeys.

To fund these projects we resorted to Green Bonds in order to distribute resources to solutions with a high social and environmental profile. From 2017 to 2021 three green bonds were issued for a total value of 2.3 billion Euro.

The fourth Green Bond that was issued at the end of 2021 with the value of 350 million Euro, is aimed at funding the purchase of Trenitalia coaches for High Speed journeys in Italy and Spain, to strengthen the European network with highly innovative vehicles.

40 electric locomotives and 140 freight train coaches



New E494 locomotives, planned to reduce noise and energy consumption

25 new ETR 1000 trains for High Speed transport of passengers


ETR 1000 trains with 94% recyclability rate

198 new electric trains for the regional transport of passengers (Pop and Rock)

Low-emission regional trains

Brand new air conditioning systems

Braking systems with kinetic energy recovery

Light alloys to reduce consumption

**Thanks to all this, we are the first company that was certified by the Climate Bonds initiative in 2019.**

GREEN FOCUS

### GREEN BONDS

Green Bonds, or Climate Bonds, are bonds issued by governments and companies to fund projects in relation to the climate or the environment.

Green Bonds were created thanks to the global institutions' growing attention to the topic of environmental sustainability. The issue of these bonds is related to projects that have a positive impact on the environment, such as energy efficiency and energy production from renewable sources or sustainable mobility. Whoever issues the bonds must guarantee maximum transparency in the communication of how the profits are managed. Finally, companies must produce reports to update investors on the progress of the projects that they have funded.

# RISKS AND OPPORTUNITIES: OUR APPROACH

WE CONSTANTLY MONITOR RISKS AND OPPORTUNITIES RELATED TO CLIMATE CHANGE, BOTH SHORT AND LONG TERM

We carefully follow guidelines provided by the European Commission, the recommendations of the TCFD (Task Force on Climate-Related Financial Disclosure) and the main standards used to monitor and manage risks and opportunities related to climate change, and their financial implications.
For this reason, we have created an interoperable work group, that works strategically to identify the impacts and to find prompt solutions to all the different issues.

## >> RISK MANAGEMENT

Only through an accurate study of the main business goals, and the identification of the risks that could compromise their results, it is possible to act and limit or minimise any possible damage.

We developed a risk management process that is structured in three areas:

- Strategic plan: development of a planning process to measure risks within our group and the companies that are under our control, paying particular attention to climate issues;
- Strategic plans and initiatives for an effective ecological transaction;
- Operational activities: risk identification and analysis managing daily operations.

We have adopted the Risk & Control Self-Assessment (RCSA) and risk management method, which entails an active participation of all the actors in the business processes and operations.

## THE PROCESS TO MANAGE PHYSICAL RISKS INCLUDES

1 - Paving the way for adaptation, by developing a framework to manage climate risks, impacts and strategy

2 - identifying risks

3 - evaluating risks, through a prototype of "Climate risk Assessment" with scenario analysis

4 - identifying adaptation options, among a list based on analysis and evaluation of hypothetical scenarios.



## >> TYPES OF RISK

According to the type of climate-related risk we operate to seize the most significant opportunities for the FS Group, from a strategic and financial point of view.

### CURRENT REGULATIONS

Monitored by the Compliance department of the Group and implemented by people designated by the different management systems.

### EMERGING REGULATIONS

The regulatory framework, subject to periodical changes is always part of the Group's business risks field. To mitigate these types of risks, the Group actively monitors regulatory developments, meets competent authorities to share its technical knowledge during consultations and, if deemed necessary, brings legal proceedings to protect the interest of the Group and of the community.

### TECHNOLOGY

Technological development has an important role, both in terms of opportunities, i.e. to improve energy efficiency and to reduce trains emissions, and in terms of transitory risk, such as automated vehicles that are now emerging on the streets, built by the automotive industry. In this sense Innovation is fundamental, it was created to improve and enable new technologies and models, according to research projects and European sustainability programs.

### LEGAL

The work of the the FS Group is subject to a wide range of environmental laws and regulations, in particular when it operates as contractor to build infrastructures, or for freight transportation that could entail risks to the environment.

### MARKET

Climate-related risks to the market, such as high speed competitors and other entities that develop services with low or zero emissions, are regularly evaluated and monitored, for what concerns strategies that the competition implements over time and that could reflect on the offer and on the presence on the reference market.

### REPUTATION

Climate-related risks to our reputation are monitored over the whole year because non-governmental organizations and associations pay close attention to the performance of the transportation sector in relation to climate.

### ACUTE PHYSICAL RISK

The Group commits to constantly monitor extreme meteorological events that could cause interruption to our work, significant disruption to infrastructures, damage and consequential reparations to customers.

### CHRONIC PHYSICAL RISK

The Group mitigates, through planning, construction and maintenance of infrastructures, chronic risks related to climate change, such as meteorological long-term variations.

# OUR RESPONSE TO CLIMATE CHANGE RISKS

THE MEDITERRANEAN REGIONS ARE ALREADY EXPOSED TO NEGATIVE IMPACTS OF CLIMATE CHANGE. AND THEY WILL BE MORE AND MORE EXPOSED IN THE UPCOMING DECADES

We, in the FS Group, want to play a defining role in terms of mitigation and adaptation to climate phenomena when developing transport infrastructures, both in case of railways and roads. We aim at intensifying our contribution to the process of mitigation and adaptation to the new climate scenario, by identifying a new program that defines the approach to climate risks and devises an organic plan of projects.

Furthermore, with the participation of sector-led teams, promoted by UIC and PIARC- World Road association, we monitor and analyse climate transition dynamics using an approach based on the Representative Concentration Pathway (RCP), defined by the Intergovernmental Panel on Climate Change (IPCC).
This activity has the goal of defining a list of adaptation measures to physical risks to develop a systematic management of climate-related issues.
We must respond, with short and mid-term concrete actions, to the upcoming consequences of climate change, with a resilience program based on the scientific analysis of climate impact to monitor infrastructures, and with dedicated structural interventions.

## >> MANAGING THE INCREMENT OF COSTS OF ENERGY AND OF RAW MATERIALS

In Italy, the price of energy has significantly increased due to variability of the price of fossil fuels, which the global political crisis could intensify, affecting transportation and much more.

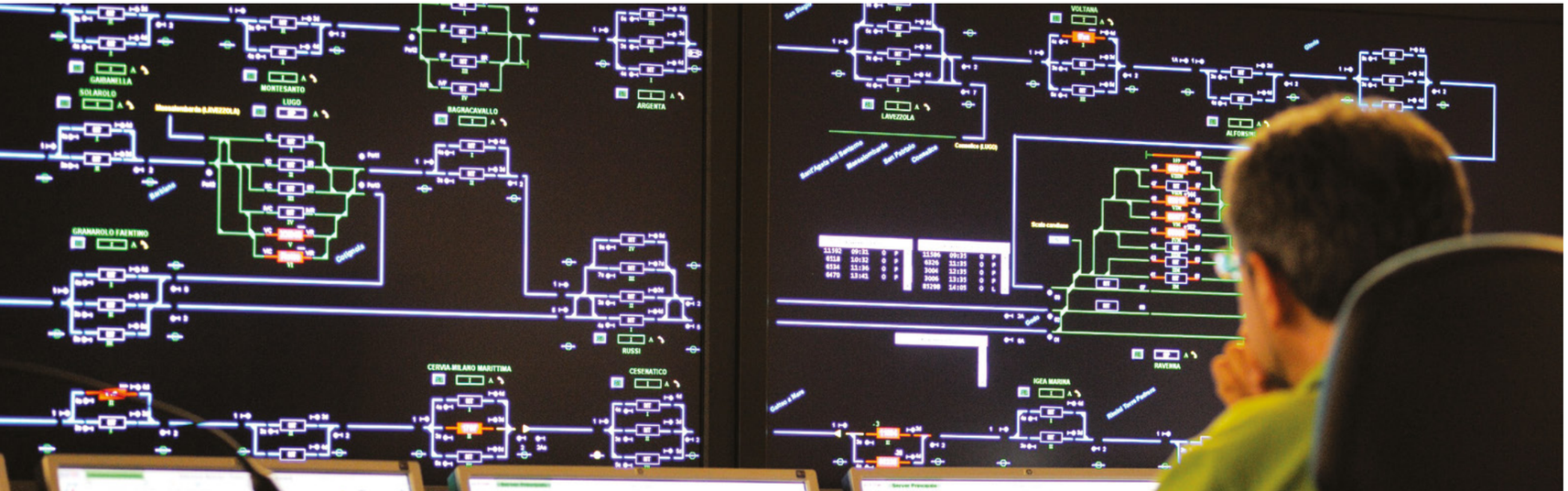
In 2022 we registered an increase of expenses of 75 million Euro, taking into consideration the average price of energy.

We constantly monitor the variation of energy prices and of raw materials.

Furthermore, we are starting a series of initiatives and investments to upgrade the fleet with vehicles that have a better energy consumption performance, and to install solar panels, with an investment of over 1.6 billion Euro, for a substantial increase of renewable, self-produced electricity.

**1.6 € billion**

Investments for self-production of renewable energy




## >> TAKING ACTION ON INFRASTRUCTURES

Italy's orographic conformation is more complex than other European countries, which causes the greatest presence of railway galleries in the continent, and a high density of bridges in relation to the total length of the train lines. The number of actions that should be taken against natural disasters (meteorological impacts, wild fires, avalanches, other environmental events) has doubled over the past five years, and the need to invest has become more and more urgent.

In light of the monitoring measures and actions taken on the railway infrastructure, we have defined a 10-years plan of modular initiatives, for an investment of 180 million Euro each year, that entails:

- Creating a data collection centre, models and algorithms for environmental research and simulations;
- Developing a digital platform to monitor climate phenomena in relation to the impact on infrastructures;
- An adaptation plan of specific interventions on infrastructures and on the national area.

With this plan, we want to achieve a better knowledge of climate impact over the course of the next decades and a better ability to monitor and prevent environmental damage.

# TURNING RISKS IN OPPORTUNITIES

WE BELIEVE THAT FROM RISKS WE CAN SEIZE PRECIOUS OPPORTUNITIES: BY DEVELOPING INITIATIVES TO REDUCE GREENHOUSE GAS EMISSIONS WE ARE PUSHED TOWARDS INNOVATION AND THINKING ABOUT THE WELL-BEING OF OUR COUNTRY.

## >> NRRP: AN ECONOMICAL RESOURCE THAT CAN BRING VALUE TO EVERYBODY

Italy presented a National Recovery and Resilience Plan (NRRP), in order to receive a part of the investments issued by the European Union, for a total amount of 750 billion Euro.

We greatly contributed to the design of Mission 3 of the NRRP, that deals with infrastructures for sustainable mobility, with the objective to create a modern, digital and sustainable system that is capable of responding to the challenge of decarbonisation.

The NRRP assigned 24.3 billion Euro - of which 23.86 to RFI- to the development of main railway lines, modernization of the entire network and upgrade of the railway transportation of freight and passengers.

**NRRP MISSION 3 FIELDS OF INVESTMENT - INFRASTRUCTURES FOR SUSTAINABLE MOBILITY**


In Europe, the transportation sector contributes with the 26% of direct $CO_2$ emissions. Railway transportation is accountable only for 0.4% of this.

It means that the highest performing investments in a recovery project, such as the NRRP, are the those made in the railway sector.

The projects that we want to implement comply with the principle of the Do No Significant Harm, as requested by the European Union, by adopting best practices during design and construction stages of the infrastructures, in order to create shared value in all the areas and to all the stakeholders involved.

Funds received from the NRRP will be decisive for High Speed connection in Southern Italy, to contribute to the reduction of GHG emissions: soon, crucial routes such as Salerno-Reggio Calabria, Palermo-Catania and Naples-Bari will become key in the path to mitigate climate change.

We calculated that for the Naples-Bari route alone, for 250 km of railway line, it will cause the reduction of three million $CO_2$ Tonnes by 2047.

**2 GWp by 2031**
Solar panels
in all the sites

## >> A NEW PROSPECTIVE FOR ENERGY PRODUCTION

We want to ensure public transport service using more and more renewable sources and reducing energy dependency from other sources.

For this reason, we decided to seize a legislative opportunity that makes it possible for us to create new photovoltaic plants in a short time-frame.

Therefore we are paving a new way towards self-production and consumption of clean and renewable energy.

The initiative entails the installation of a total of approximately 2 GWp of photovoltaic plant, to produce autonomously approximately 2.6 TWh every year.

**2.6 TWh by 2031**
Self-produced
electric power

GREEN FOCUS

### DO NO SIGNIFICANT HARM

According to the principle of Do No Significant Harm, works that are funded by the NRRP shall no cause any significant damage to the environment: such principle is fundamental to get access to Recovery and Resilience Facility Funding (RRF). Furthermore, a minimum of 37% of the expenses for investments and changes funded by the NRRP shall be allocated to support action toward Climate Goals. The DNSH principle is based on what explained in the "EU Taxonomy for sustainable finance", adopted to promote private sector investments in green and sustainable projects and to contribute to reach the Green Deal goals.

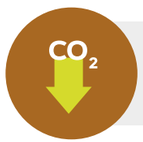
# SUSTAINABLE INVESTMENTS ARE OUR PRIORITY

EUROPEAN TAXONOMY - THE RANKING OF INVESTMENTS THAT ARE CONSIDERED SUSTAINABLE ON AN ENVIRONMENTAL POINT OF VIEW - IS A GREAT STEP FORWARD FOR OUR CONTINENT'S GREEN DEAL. WE ARE READY TO PROMOTE PROJECTS THAT ARE COMPATIBLE WITH CRITERIA DEFINED BY THE EUROPEAN UNION, FOR A FINANCE THAT EMBRACES SUSTAINABILITY.

We committed to carefully follow norms and criteria stated in the EU regulation no 852/2020, in order to provide, in our financial and non-financial reports, precious information about how and to what extent the work of the company is connected to economic activities that are considered sustainable, in particular stating the turnover generated by products or services connected to eco-friendly economic activities, the amount of their operative expenses (OpEx) and the amount of capital account expenses (CapEx).

The regulation stipulates that works and activities can be defined as sustainable if they contribute in a substantial way to achieving one or more of the six environmental goals (mitigation of climate change, adaptation to climate change, sustainable use and protection of water and maritime resources, transition towards a circular economy, prevention and reduction of pollution, protection and restoration of biodiversity and eco-systems), they do not generate significant harm to reach environmental goals and are carried out in respect of minimum safeguard guarantees.

Pollution prevention and control




Mitigation of climate change

Sustainable use of water

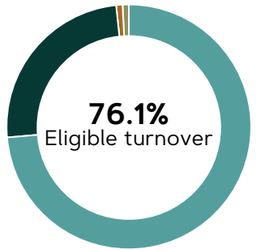
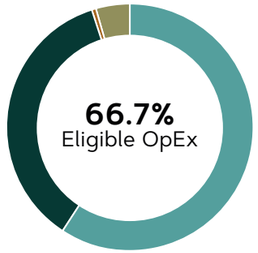
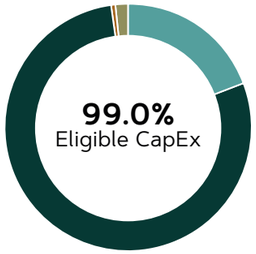
Adaptation to climate change

Transition to a circular economy

Protection of biodiversity

We focused on mitigation of climate change, which requires all the economic activities to be reshaped in order to contribute to the reduction of Greenhouse Gasses in the atmosphere, and on the Adaptation to climate change, which aims at reducing negative effects or negative risks in the current climate, or the risks of future climate changes on carrying out economical activities on people and nature.

The graphs below summarise the KPIs of the Group and its four operating segments (Transport, Infrastructure, Real Estate Services and Other Services) in relation to their respective turnovers, Operative Expenses (OpEx) and Capital Expenses (CapEx).

| TURNOVER FROM ELIGIBLE ACTIVITIES | OPEX FROM ELIGIBLE ACTIVITIES | CAPEX FROM ELIGIBLE ACTIVITIES |
|---|---|---|
|  |  |  |
| **76.1%** Eligible turnover | **66.7%** Eligible OpEx | **99.0%** Eligible CapEx |
| 56.8% - Transport | 39.8% - Transport | 19.1% - Transport |
| 19.1% - Infrastructure | 24% - Infrastructure | 78.3% - Infrastructure |
| 0.1% - Real estate | 0.1% - Real estate | 0.1% - Real estate |
| 0.1% - Other services | 2.8% - Other services | 1.5% - Other services |
| **23.9%** Non-eligible turnover | **33.3%** Non-eligible OpEx | **1.0%** Non-eligible CapEx |

**In the following chapters we will show projects that are operational or that are being developed which have a positive impact towards reaching our objectives in relation to climate change.**

PROJECTS

# BLUES, THE HYBRID REGIONAL TRAIN

WE WILL ADD TO OUR FLEET OVER A HUNDRED BLUES TRAINS. THE NEW TRAINS WITH HYBRID TECHNOLOGY, A CONCRETE STEP FORWARD TOWARDS CARBON NEUTRALITY.

The Blues regional train, created thanks to the collaboration between FS Group and Hitachi Rail, is an important evolution of our current diesel trains. Equipped with electric traction, batteries and a diesel engine, can go through non-electrified routes sensibly reducing greenhouse gasses emissions.

## Blues regional Train

>100 new trains

-50% of fuel consumption

95% recyclability



GREEN FOCUS

## HYBRID TECHNOLOGY

Since 2017 the FS Group and Hitachi Blues have been working together to develop a highly efficient train with a hybrid technology. This type of engine makes it possible for the Blues trains to travel with the use of diesel engines on non-electrified lines, with electric traction on electrified lines, and with batteries to travel the first and the last mile on non-electrified lines or when the trains are stopped at the stations, reducing emissions and noise. Batteries, that are recharged with the use of kinetic energy, also make it possible to generate higher power than normal performances, and the automated engine switch off system while approaching a station, halting at a station and departing, ensures a 50% reduction of the fuel consumption, in addition to significantly lower $CO_2$ emissions than current diesel trains, ensuring the highest level of silence while the train has stopped.

PROJECTS

# HYDROGEN BASED EVOLUTION BY QBUZZ

IN OUR PROGRESS TOWARDS A MORE SUSTAINABLE PLANET, A DECISIVE ROLE IS PLAYED BY RESEARCH INTO TECHNOLOGICAL SOLUTIONS THAT CAN REDUCE EMISSIONS IN THE TRANSPORT SECTOR.

Qbuzz, a company that is part of the FS Group operating in the Netherlands, has complied with the Dutch Government's need to be on the forefront of an ecological transition in the transportation sector. We developed a fleet that was initially made of electric buses, to then add hydrogen buses, placing, all over the Netherlands, more than 250 zero emissions public transport vehicles.
In June 2021, Qbuzz lunched a new hydrogen charging station in Groningen. A hydrogen bus recharges in less than 10 minutes and can travel for approximately 400 kilometres. Twenty new hydrogen vehicles were presented during the launch.

Hydrogen buses make it possible to reduce 1,375 $tCO_2$ every year, making Qbuzz a leading company in the path towards decarbonisation.

© Qbuzz archive

## Hydrogen Fuel Cell Buses

Green Hydrogen

-1,375 $tCO_2$ annual reduction

Charging time: < 10 minutes





### HYDROGEN TECHNOLOGY

Renewable hydrogen, generated with wind and solar energy, is considered one of the most performing low-emission fuels for the public and private transportation.

The choice of renewable hydrogen, that takes advantage of the European industry being leader in the production of electrolytic cells, is the occasion to favour economic growth in the EU and to support an integrated and efficient energy system in terms of costs. From now until 2050, as technology improves and costs of production decrease, renewable hydrogen should find application on a larger and larger scale, while introducing new methods to generate electricity from renewable sources. Hydrogen charging stations can be easily powered by local or regional electric cells, and we hope it is possible to continue to encourage the use of hydrogen electric cells for heavy goods vehicles, including buses, special purpose vehicles and those used for freight transport on long distances.

PROJECTS

# CONCRETE ACTIONS TO REDUCE EMISSIONS

EVOLUTION TO A CIRCULAR ZERO IMPACT ECONOMY GOES THROUGH TANGIBLE SOLUTIONS, THAT CAN BE IMPLEMENTED ALL OVER THE COUNTRY.

## >> WE PURCHASE ELECTRICITY GENERATED WITH RENEWABLE SOURCES

We started purchasing electricity from sources that are renewable and certified by Guarantees of Origin - GO. A significant part of this initiative can be ascribed to Anas, which, since August 2020, has been purchasing green energy for its road infrastructures. The purchase of GOs concerns also other companies, among which we shall mention TX Logistik, that covers with GOs almost 90% of the railway consumption. Resorting to GOs made it possible to reduce emissions by 160,388 $tCO_2$ and in 2020 it was renewed for the following year, with a further reduction of emissions (127,117 $tCO_2e$) for a total of avoided emissions of 287,505 $tCO_2e$.

## >> CLEAN AND SELF-PRODUCED POWER

A few years ago Trenitalia started a process of renewable energy production, by installing and activating photovoltaic plants on the maintenance sites. The projects already involves eight sites for a total of approximately 6MWp installed. Considering only 2021, the activation in the offices of Verona and Turin, in addition to the upgrade of the photovoltaic plant that was already present in the Osmannoro plant in Florence, made it possible to generate 970MWh/year of solar energy. Thanks to what was done in 2021, GHG emissions have been reduced by 313 $tCO_2e$ each year.


## >> HIGH PERFORMANCE HEATING SYSTEMS

The project implements a radian strip heating system in the plants in Turin, thanks to which we estimate a reduction of emissions by 138 tep and 333 $tCO_2e$ in the medium term.

## >> AN UPGRADED FLEET OF BUSES IN ALL EUROPE

An important contribution to consumption reduction is achieved thanks to a constant monitoring and a possible upgrade of vehicles, to add to the fleet cutting-edge, highly performing and energy efficient buses.

All over Europe we have replaced the oldest buses with technologically advanced vehicles: in 2021 Busitalia Veneto replaced 99 old buses with the new Euro 6 diesel vehicles, and an electric one, with an annual reduction of emissions of approximately 989 $tCO_2e$, and Busitalia Campania upgraded its fleet with 42 Euro6 buses, for a total saving of annual emissions of approximately 209 $tCO_2e$.

Qbuzz, in the Netherlands, in the area of Utrecht, added to its fleet 35 electric buses which led to an annual reduction of 2,454 $tCO_2e$ and to a saving of 784 thousands of litres of diesel.

GREEN FOCUS

### GUARANTEES OF ORIGIN

The Guarantees of Origin are a form of insurance issued on demand by Member States by renewable energy producers. They aim at providing the final customers with certain percentages of certified energy, on the basis of objective, transparent and non-discriminatory goals.

Each Guarantee of Origin equates to a standard quantity of 1 MWh.

The Guarantee of Origin designates at least:

- The sources of energy used to generate energy and starting and ending date for the production;
- The name, place, type and capacity of the plant used to generate the energy;
- If, and to what extent, the plant has benefited from investment support, and if the energy unit has benefited, in any way, from a national support scheme;
- The activation date;
- The date, the issuing country, and the unique ID number.

PROJECTS

# PROJECTS FOR OUR NEXT FUTURE


© Anas archive

WE ARE PLANNING NEW OBJECTIVES
AND THE ACTIVATION OF NEW TECHNOLOGIES
THAT WILL MOULD THE SOCIETY OF
TRANSPORTATION, WITH TANGIBLE PROPOSALS
AIMED AT A SUSTAINABLE MOBILITY.

## >> GREEN LIGHTS, SMART LIGHTING SYSTEM FOR ITALIAN GALLERIES

For what concerns motorways, we are planning to reduce energy consumption for the lighting systems of the 1,900 galleries that we manage over all the Anas network.

With an investment of 30 million Euro we are going to replace the obsolete lighting systems that are currently installed in the galleries with cutting edge LEDs, equipped with control systems and consumption monitoring, to manage visibility in a smart way and to exponentially increase the levels of safety.

With such works, which started on the main routes of the whole country in 2018, we predict an average saving of 15,000 MWh and approximately 4,000 $tCO_2$.

## >> ECOROADS, A NEW IDEA OF ROAD

We are planning new techniques to mitigate noise and air pollution by introducing trees inoculated with hydrocarbon degrading bacteria that can help remove the main components of air particulates.

The plan is to plant trees along driving routes to create natural barriers against noise, heat, and carbon dioxide generated by car exhausts, in addition to improving the landscapes.

This project will lead to an average annual saving of six decibels per planted hectare in terms of noise pollution, and up to 270 kilograms of PM10 per hectare in terms of air pollution.

## >> A TOOL THAT MEASURES THE CARBON FOOTPRINT OF OUR PROJECTS

Engineering has a key role in supporting ecological transition, defining concrete actions that can be taken to reduce $CO_2$ emissions. Under this point of view, Italferr, FS Group's engineering company, has developed and certified a Carbon Footprint model for the projects, according to the UNI ISO 14064 standard.

This makes it possible to estimate, by setting a GHG emissions inventory, the climate footprint of the infrastructure work, by quantifying GHG emissions generated in the creation of the work, i.e. during the stages of production and transport of materials and of works in the building sites.

The carbon footprint model is an effective operational tool that gives directions to project designers to find more sustainable designs, encouraging the building sector to adopt more efficient systems for the creation of infrastructures.

## >> TERNI, FLAGSHIP FOR A LOCAL, PUBLIC, GREEN, HYDROGEN TRANSPORT

We started a collaboration between Acciai Speciali Terni, Busitalia and the Local Government of Terni, to start a unique project in Italy: using excess hydrogen generated by the steel manufacturer for local public transport.

Thanks to the experience acquired by Busitalia in the Netherlands, and to the funding received by the NRRP for sustainable mobility, we can work together with the municipality of Terni to create a fleet of hydrogen buses and their corresponding charging station and the distribution. According to the plan, the infrastructure will be developed in an intermodal manner, to recharge both hydrogen cars and trains.

Finally, in collaboration with the University of Perugia we are studying systems for the production of synthetic fuels starting from green hydrogen and collecting greenhouse gasses form industrial production of food released into the atmosphere.

Terni will become a pioneer city in a process of innovation of the public local transport, in views of waste reduction, and attention to the environment, both in cities and all over the country.

PROJECTS

# LET'S ASSIGN A PRICE TO CARBON DIOXIDE

MORE AND MORE COMPANIES IN THE WORLD SUPPORT THE INITIATIVE THAT ASSIGNS AN ECONOMIC VALUE TO $CO_2$ THAT IS PRODUCED AND RELEASED INTO THE ENVIRONMENT. A QUANTITATIVE METHOD TO STUDY THE IMPACT OF A COMPANY AND TO HAVE A FURTHER TOOL TO FACILITATE DECARBONISATION.

In 2021, for the first time, with an actual economic environment, an internal document that defined the method to evaluate GHG emissions within investment projects was published.
The reason behind this document was to offer a reference system to calculate, value, the impact of $CO_2$ on the different initiatives, throughout their life-cycle. The objective of this value is to raise awareness not only about the actual costs that the company has to face, but also about the impact on the local area and on the It is another tool that supports us in the evaluation of feasibility of a project, that makes it possible for us to keep an eye on the commitment that a high-impact work requires in terms of GHG emissions.


## >> HOW MUCH DOES $CO_2$ COST?

According to the economic footprint conversion, calculated in tonnes of $CO_2$ ($tCO_2e$), our internal method suggests to apply the avoidance cost approach.

The estimate of the conversion is calculated in €/$tCO_2e$, in a range of short and middle-term projects the average value applied is of 100€/$tCO_2e$, while for long-term projects we refer to an average value of 269 €/ $tCO_2e$. These values are in line with the estimates defined by 28 European Union States, with average values defined by the Handbook on external costs of transports.

The calculation method was published internally at the end of 2021: considering the limited amount of time for an accurate evaluation, it is not possible to evaluate the actual impact of this method.

In any case, we decided to integrate the internal procedures of all the FS Group companies with a specific evaluation of $CO_2$ emissions for investment projects, in line with the method.


**€ 100**
Cost of $tCO_2$ for short/medium-term projects

**€ 269**
Cost of $tCO_2$ for long-term projects

GREEN FOCUS

## CARBON PRICING AND CARBON TAX

Carbon pricing is the price assigned to greenhouse gasses such as $CO_2$ and methane. Carrying out services or products with negative effects on the climate, have a negative impact on the environment, generating costs that will burden on the collectivity. The aim of Carbon Pricing is to encourage companies to take into consideration this cost.

Many countries in the world have introduced a specific tax (Carbon Tax) on emissions, to encourage the most polluting companies to find sustainable solutions that have a lower impact on the environment.

We are evaluating systems of economic balance and management to respond to the need to reduce global emissions, such as the Emission Trading System (ETS), according to which each country must determine a maximum amount of emissions that can be generated by companies on their territory: therefore we see the creation of the carbon market, in which the emission of agents that have a negative impact on the climate becomes for all the companies a limited resource that has to be purchased.

These are some of the solutions that are proposed and applied by many countries in the world to promote a quick move towards renewable and clean energy sources.

# PERFORMANCE, THE RESULT OF OUR COMMITMENT

TRANSPORT SERVICES HAVE A HIGH ENERGY REQUIREMENT, WHICH NEEDS TO BE MONITORED AND REPORTED IN DETAILS TO IMPROVE THE EFFICIENCY OF THE SERVICES PROVIDED AND TO REPRESENT PROGRESS AND PROBLEMS OUTSIDE THE COMPANY.

## >> PRODUCTION DATA

The main modes of transport of the FS Group are trains and buses, but there are also navigation services provided by Bluferries, Blujet and Busitalia Sita Nord. Production data that highlight the distance covered for each of these services are written in train-kilometre and bus-kilometre, which is the distance of one kilometre covered by the travel mode mentioned.

**Passenger traffic and freight traffic in relation to transport services (in thousands)**

| KPI | 2021 | 2020 | 2019 |
|---|---|---|---|
| **Train-km passengers** | 270,216 | 242,126 | 310,386 |
| **Train-km freight** | 43,065 | 40,991 | 41,210 |
| **Bus-km freight** | 178,063 | 172,560 | 207,386 |

Production data that define the size of the transport service that is created is written in passenger-kilometre and tonnes-kilometre, which mean the transfer of either one single passenger or a tonne of goods for a kilometre with the analysed mode of transport.

**Passenger traffic and freight traffic in relation to transported units (in millions)**

| KPI | 2021 | 2020 | 2019 |
|---|---|---|---|
| **Passengers - km on a train** | 21,522 | 18,154 | 45,716 |
| **Goods - km on a train** | 21,880 | 20,688 | 22,035 |
| **Passengers - km on a bus** | 1,733 | 1,713 | 2,935 |

**In the next chapters we will represent, in quantitative terms, the different performances of transport services; energy consumption and related emissions of greenhouse gasses, energy cost and the importance of the items in the environmental statement.**

PERFORMANCE

# ENERGY TO MOVE THE COUNTRY

DATA ARE CLEAR, GREEN SOLUTIONS ARE WINNING: REDUCTION OF CONSUMPTION AND EMISSIONS ALSO LEAD TO ECONOMIC ADVANTAGES.

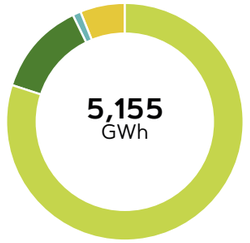
The total volume of energy consumed in 2021 was 24.6 million GJ. From 2020, the increase, linked to the upswing in transport services, is seen in the variations in the main energy items linked to transport activities: electricity for railway traction (+6.2%) and diesel (+4.7%).
Electricity had the majority share and highest percentage of total energy consumption considering electricity for railway traction, road network lighting and other uses (roughly 70%). Electricity for railway traction absorbs 80% of the 5,155 GWh total energy consumed. As a matter of fact, a large part of trains travel on the electric network (over 70% in Italy) with positive implications due to the possibility of benefiting from the of generation of electricity from renewable sources of the national energy mix.
In reference to the electricity requirement for other uses than railway traction, in 2021 we purchased GOs to cover approximately 61% of the consumptions (about 791 GWh). This improved from 37% in 2020, proving a growing commitment over the years. The overall consumption of oil amounts to a total of 172.2 million litres, which covers about half of the railway traction services, 27% of the road transport and 11% of navigation. The remaining portion was consumed by road and work vehicles (8%) and heating (2%).
Natural gas is used to heat rooms (86%) and only residually for transport, mostly to power part of the public transport road fleet (13%).
We commit to use energy from renewable sources, and this is proven by our biodiesel consumption, introduced in 2020, amounting to approximately 6.2 million litres, and by our new hydrogen consumption, amounting to 53 tonnes in 2021, both used for local public transport, in addition to the use of energy coming from photovoltaic plants, amounting to 4.6 GWh (nearly 58% more than the previous year) and the use of thermal solar energy, amounting to approximately 22 MWht in 2021.

In Italy 70% of the railway network is electrified

Over 4.6 GWh of energy consumption from self-produced renewable energy

6.2 million litres of biodiesel consumed in 2021

## ELECTRICITY

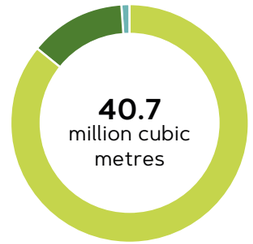



- 80% - Railway traction
- 13% - Electricity
- 1% - LPT
- 6% - Road network lightning

## DIESEL OIL


- 52% - Railway traction
- 27% - Road vehicles traction (public transport)
- 11% - Waterway navigation
- 8% - Road vehicle traction (road and work vehicles)
- 2% - Heating

## NATURAL GAS




- 86% - Heating
- 13% - Road vehicle traction (public transport)
- 1% - Industrial activities and traction (cars and work vehicles)

### Fuel consumption (in MWh)

| Type of consumption | Certified or self-produced energy from renewable sources | Other sources* | Total |
|---|---|---|---|
| Fuel consumption | 65,336 | 2,102,671 | 2,168,007 |
| Consumption of purchased electricity | 791,696 | 4,358,239 | 5,149,934 |
| Consumption of purchased cooled or heated energy | 0 | 13,601 | 13,601 |
| Consumption of self-produced renewable energy (excluding fuels) | 4,609 | 0 | 4,609 |
| **Final overall energy consumption** | **861,641** | **6,474,511** | **7,336,152** |

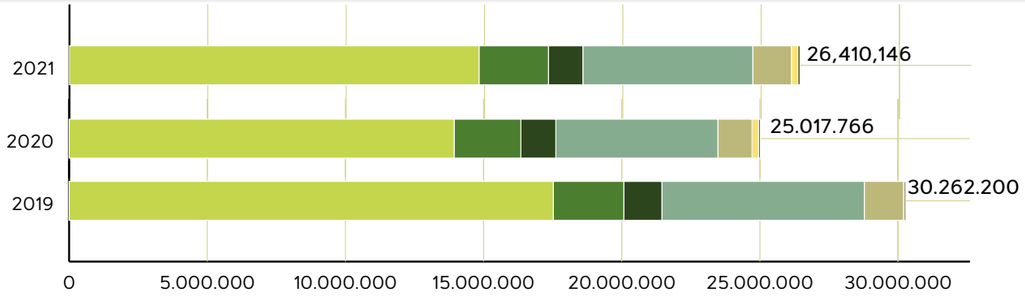
** Other sources include both the national renewable mix and the non renewable sources.*

## >> ENERGY CONSUMPTIONS AFTER THE PANDEMIC CRISIS

2021 was a year of recovery for transport services after the stop to mobility due to the measures adopted to control Covid-19 infections. Looking at the history of consumptions we can notice the impact of the pandemic crisis in 2020, with a significant drop in traffic due to mobility limitations connected to the health emergency that partially affected also 2021. In comparison to 2020, 2021 was characterised by a partial recovery of traffic, but with a slight increase of consumptions, especially those related to railway traction.

In order to quantify efficiency of transport services, we monitor final specific consumption, calculated as the ratio between energy used for railway services in Italy on electric and diesel trains, and the reference traffic units to transport people on trains (passengers*km) and freight (tonnes*km). Affected by a variety of factors (e.g. speed, altitude, vehicles, load factor, transported weight, atmospheric conditions, etc.), these indicators did not show any material changes in passenger traffic during the analysed time-frame, especially in 2020, due to the downturn in passengers and restrictions on passenger numbers. However, the ratio did drop to around 644 kJ/passenger-km in 2021. The ratio of freight traffic, on the other hand, did not show any significant changes (roughly 133 kJ/tkm).

### FINAL ENERGY BY SOURCE IN GJ




**Electricity for railway traction**
**2021:** 14,803,061
**2020:** 13,934,831
**2019:** 17,522,131

**Electricity for other uses**
**2021:** 2,508,701
**2020:** 2,412,378
**2019:** 2,550,335

**Electricity for road network lighting**
**2021:** 1,244,516
**2020:** 1,265,872
**2019:** 1,379,451

**Diesel**
**2021:** 6,141,810
**2020:** 5,863,942
**2019:** 7,324,771

**Natural gas**
**2021:** 1,396,065
**2020:** 1,236,602
**2019:** 1,418,331

**Biodiesel**
**2021:** 228,813
**2020:** 240,958
**2019:** -

**Other**
**2021:** 87,179
**2020:** 63,183
**2019:** 67,182

## >> WE MANAGE ENERGY COSTS

The cost of TTF natural gas (European reference market for natural gas) has increased over the year of approximately 500%, and at the same time the cost of $CO_2$ has more than doubled (from 33 to 79 €/t$CO_2$). The substantial increase of the costs of fuel and $CO_2$ has reflected also on the increase of the price of wholesale electricity on a national level, the Single National Price (PUN in Italian) which over the year has increased of over 400% (from 61 to 288€/MWh in monthly average values).

These increases affect all Europe and have a big impact on costs of materials and on inflation.

In the railway transport sector energy consumption is important, therefore, the ratio of energy costs (over 5%) is equally relevant, as are its overall operational costs.

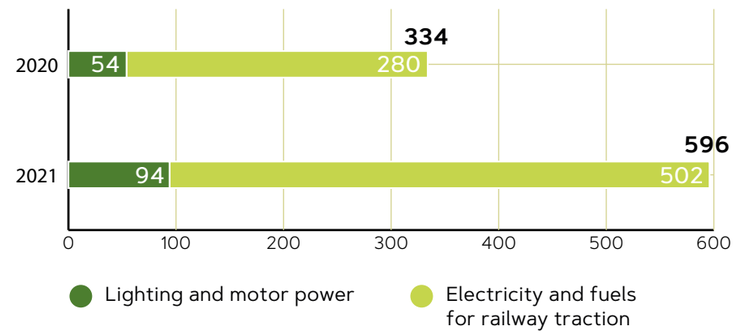
Electricity and fuels used as power source for railway traction represent the main energy expense. In 2021 these costs amounted to a total of 502 million Euro, a digit that has almost doubled in comparison to 280 million Euro in 2020 (+79%). The increase of the costs happened especially in the month of September 2021 and had an impact in absolute terms, in views of a partial recovery of the railway traffic.

Electricity costs for lighting systems and motor power have almost doubled compared to 2020 and amount to approximately 94 million Euro, while in 2020 were 54 million Euro (+74%)

The fluctuation of energy prices represents a significant risk also for future years, especially in views of the development of geopolitical dynamics in Europe, i.e. The Russia-Ukraine conflict.

Therefore, we are even more motivated to carry our medium-long term strategies towards a complete decarbonisation and to increase the ratio of self-produced renewable energy.

### ENERGY COSTS IN MILLION €



PERFORMANCE

# EMISSIONS

THE INITIATIVES THAT WE ARE PURSUING TO REDUCE EMISSIONS ARE GENERATING HIGH-IMPACT RESULTS TOWARDS REACHING OUR GOALS

2021 was the year of recovery from Covid-19 pandemic, and saw consumptions increasing. Nonetheless, the production of greenhouse gasses emissions recorded last year, amounting to 2.06 million tonnes of $CO_2$ (Scope 1 and Scope 2 location-based), is lower than the value recorded in 2020. On one hand the impact of the pandemic had strong repercussions on 2021, on the other hand, we also showed great resilience to change, committing to pursue our sustainability journey, thanks to a continuous upgrade of our fleets with with vehicles that have a higher energy efficiency. More elements that contributed to the improvement of our performance in terms of emissions are for instance: the decrease of the emission factor of the national fuel mix (which has an impact on the location-based approach) and the progressive increase of purchase of electricity generated by renewable sources and certified by Guarantees of Origin (that reduces emissions in the market based approach).

Similarly to the energy consumption analysis, the main emissions deal with the use of electricity for railway traction, as a consequence of the significant traffic on electrified lines. In addition, there is the consumption of diesel used for railway traction, which increased compared to last year due to a partial recovery of transport services. Other significant emissions are produced by electricity used for lighting systems and motor power, for electric services (i.e. Power source for offices, workshops and train stations), for roads and galleries, for local public service; from the use of diesel to fuel buses, for navigation and for company cars and from methane mainly used for heating. Another contribution to the reduction of emissions is made by the increase in the use of green hydrogen and biodiesel HVO, used for local public transport, especially in the Dutch company Qbuzz, and the growing self-production of electricity from photovoltaic plants.

**2040 Goal**
Carbon Neutrality

**AVOIDED EMISSIONS THANKS TO TRAINS AND BUSES (in comparison to trucks and cars)**

**–1.6 $tCO_2$**
passengers

**–1.5 $tCO_2$**
freight

**B Level**
Climate rating
Carbon Disclosure Project

## GREEN FOCUS

### THE SCOPES

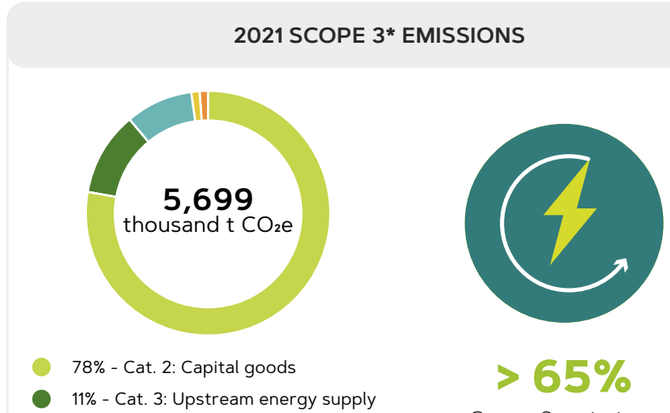
The GHG Protocol Corporate Accounting and Reporting Standard guide, written in 2004, also referred to as Corporate Standards, provides a standardised method to quantify company greenhouse gas emissions. Corporate Standards ranks direct and indirect emissions according to 3 Scopes

- Scope 1: direct GHG emissions that occur from sources that are owned or controlled by the company
- Scope 2: indirect GHG emissions from the generation of purchased electricity consumed by the company. Scope 2 emissions are in turn divided in location-based (the average intensity of greenhouse gas emissions of the networks where the electricity is consumed, mainly using data related to the average network emission factor) and market-based (electricity emissions that a company chooses by contract. Emission factors come from contract tools, that include any type of contract between two parties for the sale and the purchase of energy in which the modality of generation of energy is certified. The market-based calculation can require the use of a residual mix, if the level of intensity of the emissions of the company is not specified in its contracts;)
- Scope 3 include all the other indirect emissions that are generated by the value-chain of the company. They are divided in 15 categories:
  - Purchased goods and services
  - Assets
  - Activities related to fuel and energy not included in scope 1- 2
  - Transport and upstream distribution
  - Waste generated by operations
  - Work travels
  - Employee's commuting
  - Upstream goods
  - Transport and downstream distribution
  - Processing of sold products
  - Use of sold products
  - End of life-cycle of sold products
  - Downstream goods
  - Franchising
  - Investments

In line with our approaching methodology, which follows the GHG Protocol standard, we classify gas emissions according to *scopes*. In particular, Scope 2 emissions are defined using the location-based approach, however, we commit report them also according to the market-based approach in our Sustainability Report. In 2021, the FS Group detected 5.7 million of $tCO_2e$ of Scope 3 emissions, divided in the following significant categories: "capital goods" (78%), "upstream energy" (11%), "use of the railway infrastructure by other railway companies" (10%) and "purchased goods and services" (1%). The high impact of Scope 3 emissions relates to the fact that they cover the whole value chain, including those related to supplies. In 2021 the number of these emissions has grown due to an increase of provisions in the supply chain, mainly caused by material used in railway wok sites.

| $CO_2e$ DIRECT AND INDIRECT EMISSIONS (LOCATION-BASED) - (SOURCE) | MEASUREMENT UNIT | 2021 | 2020 | 2019 | % CHANGE 21/20 |
|---|---|---|---|---|---|
| Electricity for railway traction | $tCO_2e$ | 1,198,449 | 1,235,303 | 1,624,718 | -3.0% |
| Electricity for other uses | $tCO_2e$ | 184,780 | 193,375 | 222,076 | -4.4% |
| Electricity for road network lighting | $tCO_2e$ | 96,728 | 105,313 | 122,480 | -8.2% |
| Other (*) | $tCO_2e$ | 19,945 | 16,837 | 12,312 | 18.4% |
| **TOTAL (Scope 2 *** location-based)** | **$tCO_2e$** | **1,499,902** | **1,550,828** | **1,981,586** | **-3.3%** |
| | | | | | |
| Diesel | $tCO_2e$ | 480,137 | 458,497 | 571,585 | 4.7% |
| Natural gas | $tCO_2e$ | 80,926 | 71,947 | 82,738 | 12.5% |
| Other (**) | $tCO_2e$ | 2,522 | 1,361 | 1,231 | 85.4% |
| **TOTAL (Scope 1***)** | **$tCO_2e$** | **563,585** | **531,805** | **655,554** | **6.0%** |
| **TOTAL (Scope 1 + 2 location-based)** | **$tCO_2e$** | **2,063,487** | **2,082,633** | **2,637,142** | **-0.9%** |

*(*) Electricity per LPT, heat*
*(**) Petrol, LPG, fuel oil, biodiesel*
*(***) Scope 2. Emissions from the generation of electricity purchased and consumed by the organisation for electrical devices, heating and lighting in buildings; companies are indirectly responsible for the emissions generated by the supplier to produce the electricity requested. Scope 1. Emissions from the direct combustion of fossil fuels purchased for heating, to generate electricity and thermal energy and to fuel transport vehicles.*


| SPECIFIC FINAL EMISSIONS FOR RAILWAY TRACTION IN ITALY | MEASUREMENT UNIT | 2021 | 2020 | 2019 |
|---|---|---|---|---|
| Average specific emissions per transport service | $gCO_2$/UT | 36.8 | 42.9 | 28.8 |
| Railway passengers traffic emissions | $gCO_2$/pkm | 49.3 | 59.7 | 32.0 |
| Railway freight traffic emissions | $gCO_2$/tkm | 10.2 | 12.2 | 12.2 |
| Road traffic emissions | $gCO_2$/pkm | 98.9 | 94.8 | 54.3 |

| FS GROUP CARBON INTENSITY 11 | MEASUREMENT UNIT | 2021 | 2020 | 2019 |
|---|---|---|---|---|
| Specific $CO_2$ emissions (location-based) | ($gCO_2$/kUT) | 44,784 | 50,344 | 36,655 |
| Specific $CO_2$ emissions (market-based) | ($gCO_2$/kUT) | 40,706 | 49,078 | 38,185 |

We also monitor our performance using indicators for specific emissions, that represent our Scope 1 and 2 emission impacts in relation to turnover and transport units.

In 2021 we recorded approximately 170 $tCO_2e$/M€, which is 11% lower than the previous year, mainly thanks to an overall increase of turnover, related to the positive trend of railway transport and infrastructure services.

Specific emissions per traffic unit recorded were nearly 59.82 $gCO_2e$/passengers-km for train traffic, 87.47 $gCO_2e$/passengers-km for bus traffic, and overall 61.88 $gCO_2e$/passengers-km.

The overall indicator recorded a significant decrease of -15%, which is mainly due to the partial recovery of the railway passenger transport. Moreover, in 2021, compared to last year, in relation to the Italian area, the specific emissions caused by freight traffic slightly decreased to 10 $gCO_2e$/tonnes-km.

As part of its process to fine-tune reporting and transparency on environmental issues, the group signed up for the Carbon Disclosure Project (CDP), a global reference point on climate change. FS was rated "B" (management score bracket) in 2021.

## OVERALL EMISSIONS BY SCOPE

**563,585**
Scope 1

**1,499,901**
Scope 2 - location-based

**1,314,383**
Scope 2 - location-based

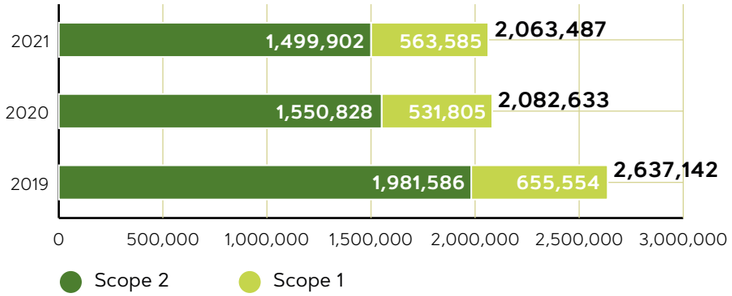
**57,988**
Scope 3 - Cat. 1
Purchased goods and services

**4,431,591**
Scope 3 - Cat. 2
Capital goods

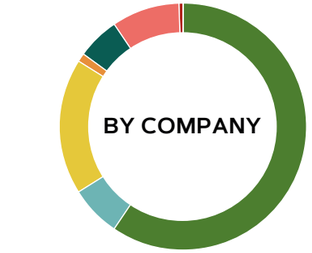
**632,710**
Scope 3 - Cat. 3
Fuel-and-energy-related activities

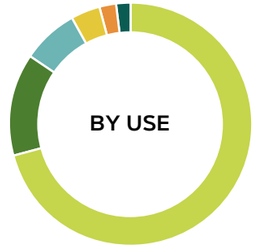
**549,123**
Scope 3 - Cat. 11
Use of sold products

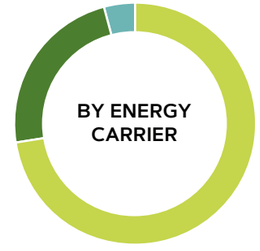
## SCOPE 1 AND 2 location-based EMISSIONS ($tCO_2e$)







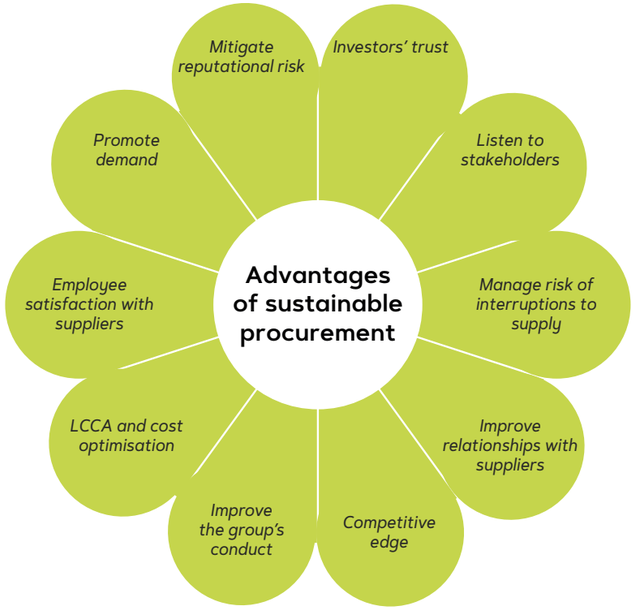



# STAKEHOLDERS INVOLVED IN STRATEGIES FOR THE CLIMATE

INVOLVING PROVIDERS, INSTITUTIONS, CUSTOMERS AND PARTNERS WE CAN OPERATE IN SYNERGY TO PROMOTE A MORE AND MORE SUSTAINABLE MOBILITY AND CREATE VALUE FOR EACH INVOLVED PARTY. ONLY THROUGH A GOOD RELATIONSHIP AND A CONTINUOUS DIALOGUE WE CAN ACHIEVE THE LONG-TERM GOALS THAT WE HAVE SET.

## >> MANAGEMENT OF THE SUPPLY CHAIN

We launched an important project to redefine the standards of our supply chain: we set a series of guidelines for an upgraded sustainable supply chain; in line with existing business processes inside the different operating companies, with the goal of integrating every social and environmental aspect to the procurement stage and to analyse the performance of all the value chain.





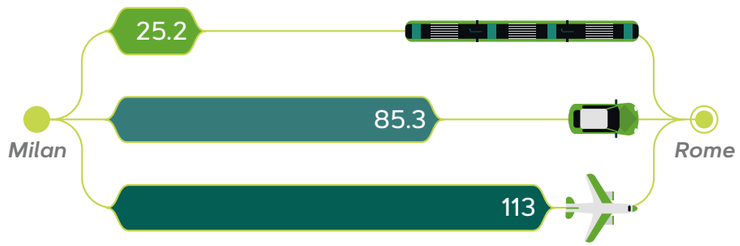

## >> OUR COSTUMERS

With a synergistic relationship with our customers we can really contribute to the reduction of GHG emissions, and we want to reinforce the promotion of our most sustainable services to promote the idea of a cleaner and more sustainable mobility.

The train, on the environmental point of view, is one of the modes of transport with the highest efficiency and lowest impact. Thanks to technological evolution we have managed to reduce emissions, year on year.

We want to improve our communication with costumers, by showing effective benefits of the use of trains compared to other modes of transport, using clear and exhaustive infographics on our main promotional tools, on online and paper tickets. We are evaluating further incentives for costumers, in form of gamification solutions, such as Green Points collection with emissions saved thanks to train journeys to get awards and discounts.

Our strategy for the upcoming years is to encourage costumers to diversify their movement with more sustainable solutions, such as public transport and sharing services: it is estimated that the use of train as an alternative to cars, over the last year, led to a saving of 2 million tons of $CO_2e$ emissions.




kg of $CO_2$ per passenger on the Rome-Milan section (source ecopassenger.org)

GREEN FOCUS

### CARBON DISCLOSURE PROJECT

The Carbon Disclosure Project (CDP) is an international organisation that for the past 15 years has been supporting companies, investors, cities and regions, raising awareness, sharing knowledge and helping managing environmental impact. The CDP goal is to make reporting and risk management of environmental topics central to company operations. Over 13,000 companies take part today to Carbon Disclosure Project platforms and they represent over 64% of the global market capital by sharing environmental and climate data, providing information on governance, risks, strategy, metrics and objectives. The deeply rooted experience on environmental topics, in particular the climate-related ones, makes the Carbon Disclosure Project one of the main international points of reference for what concerns environmental management and its main tool, the questionnaire, has been in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) since 2018. By filling in the questionnaire, we want to confirm our commitment on reporting and management of environmental aspects related to climate change. Moreover, we are going to receive a public evaluation of our sustainability profile, information that is useful for the stakeholders that operate within a sustainable economy.

## >> SECTORAL ORGANISATIONS

We are part of many sectoral organizations and we promote activities of organisations that facilitate sustainable mobility and a concrete vision of a zero-emissions future.

In the UIC we follow international negotiations of the Conference of the Parties on Climate Change (COP) which took place several times, among which in Paris, Marrakesh, Madrid and Glasgow and we are partners for important energy efficiency projects and other activities led by the Sustainability Platform.

On the 30th of October 2021, in the occasion of COP26, we had the opportunity to experience the launch of the Connecting Europe Express, a special train that went through 26 European countries, among which Italy, and travelled 20 thousand kilometres, in over a hundred cities.

A project that involved more than forty railway operators infrastructure managers and partners, aimed at raising awareness on the role of the railway transport to reach decarbonisation goals, and to highlight the importance of trains in connecting people and spaces.

As FS Group we are also members of the Community of European Railway and Infrastructure Companies (CER), and we work at round-tables and dossiers, such as the Fit for 55 packet, strictly related to the Paris Agreement objectives, the EU ETS Directive (Emission Trading System), the Energy Tax Directive, the Effort sharing regulation to reduce climate-change related emissions and the regulation on alternative fuel. Thanks to these mechanisms we want to encourage measures such as taxing $CO_2$ emissions and improving energy efficiency, creating infrastructures needed for a sustainable mobility and at the same time improving intermodal competitiveness of the railway system.


## >> OUR PARTNERS FOR INTEGRATED MOBILITY

We want to upgrade to multi-modal transport for passengers in order to increase the efficiency of the public transport system and to reduce road traffic, that has a higher impact on climate emissions. For this reason we are working together with several mobility partners in the field of sharing, to promote a mobility system focused on modes of transport with low environmental impact. This synergy has a positive impact especially on urban areas with the highest population density and where the most negative repercussions of transports are recorded (pollution, average speed of vehicles, rate of accidents, etc.). For instance, in the past years Trenitalia started a few partnerships with third parties to offer customers integrated mobility solutions, such as: train+car sharing, train+scooter sharing and train+bike sharing in several cities. In particular, Trenitalia has signed a partnership with Enjoy, a car-sharing service managed by Eni, in partnership with FCA, which operates in Rome, Milan, Florence, Turin and Bologna, and with Moreover, owner of different scooter operators, electric scooters, and e-bike sharing (Zig Zag, Cooltra, Helbiz and Bird) that operate in many cities all over Italy: Rome, Milan, Florence, Palermo, Turin, Verona, Pesaro, Rimini, Bari, Pescara, Cesena, Naples, Ravenna, Modena, Parma, Latina, Pisa and Ferrara.

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