

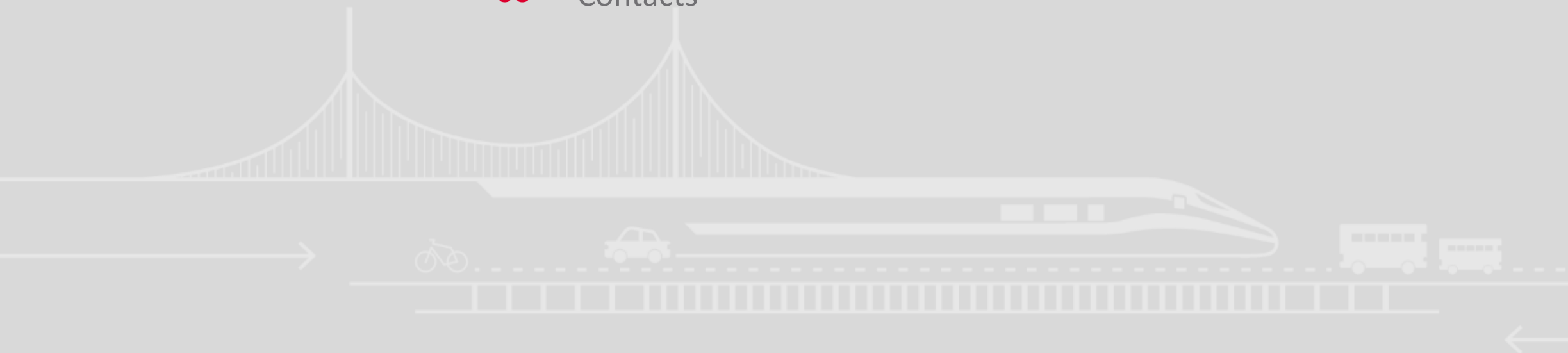
GREEN BOND REPORT

related to the EMTN bond Series 10, Series 17 and Series 18



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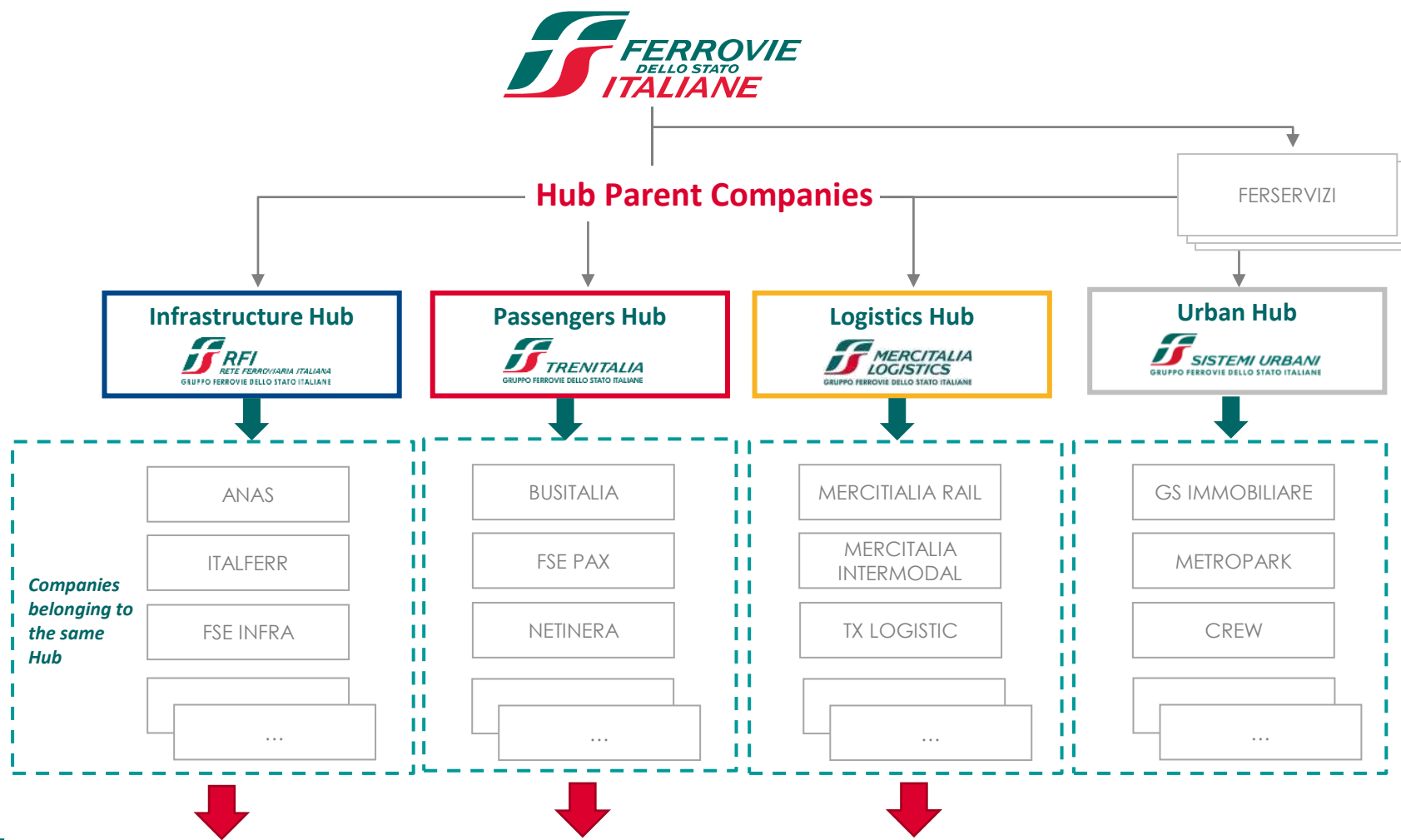
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FS Group Overview and Sustainability



FS Group in a snapshot

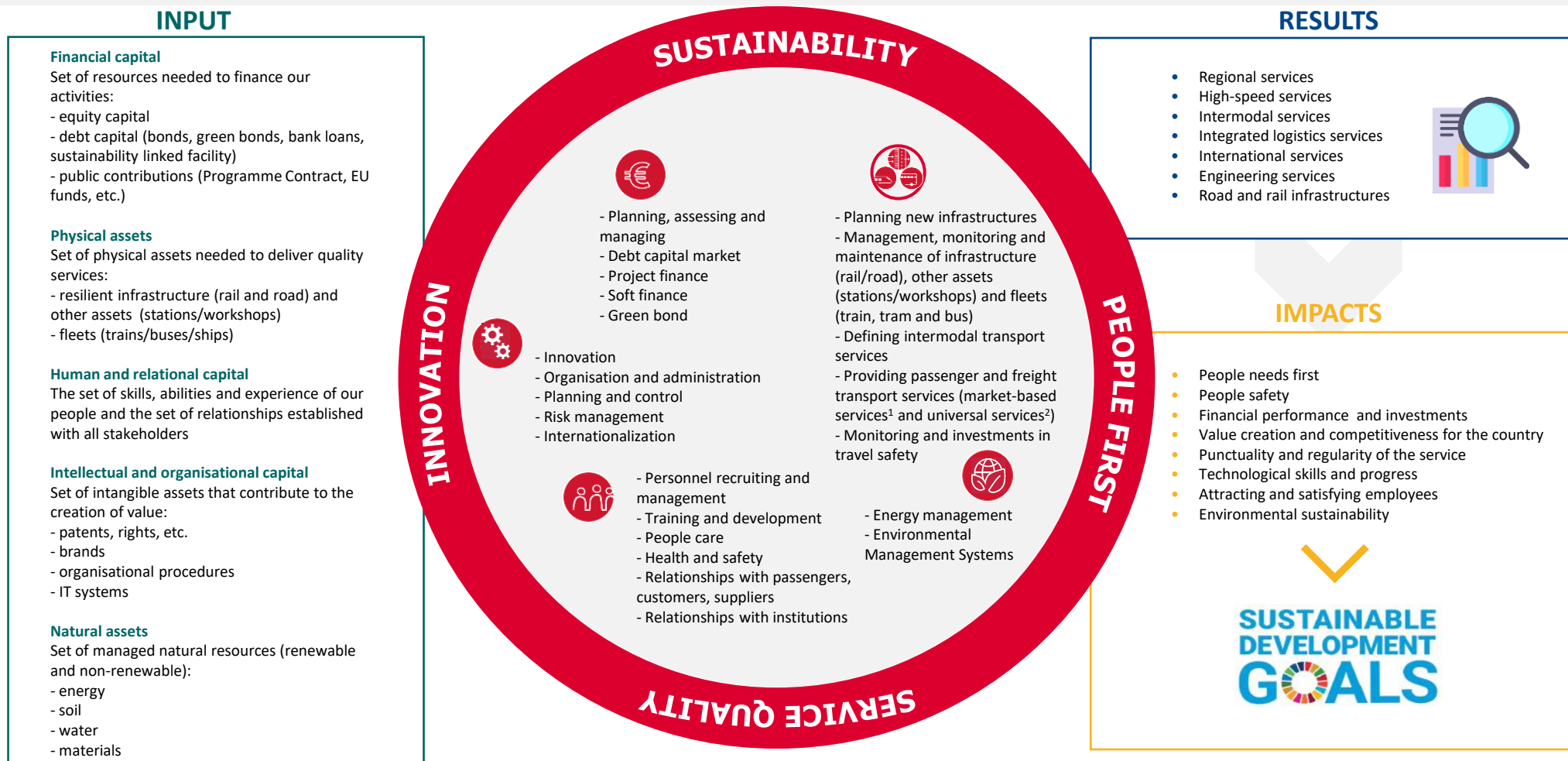
Ferrovie dello Stato Italiane SpA (“FS” or the “Issuer”) – **100% Italian State owned** – is the holding company of the Italian railway group (FS Group). As **one of the largest industrial groups in the Country**, it manages rail and road networks and transport services by rail and bus both passenger and freight, contributing to develop integrated mobility and logistics in Italy and abroad.



A business model which fully integrates sustainability

Group Vision

FS Group vision is to become the company that enables a system of resilient infrastructure, sustainable mobility and integrated logistics



FS Group Sustainability Commitment

Our agenda for a sustainable mobility

The Group intends to place sustainability increasingly at the heart of its strategies. For this reason, the FS Group committed to 12 of the **Sustainable Development Goals (SDGs)** identified by the United Nations 2030 Agenda.



Sustainability performance

The Group commitment is positively reflected in its sustainability ratings:

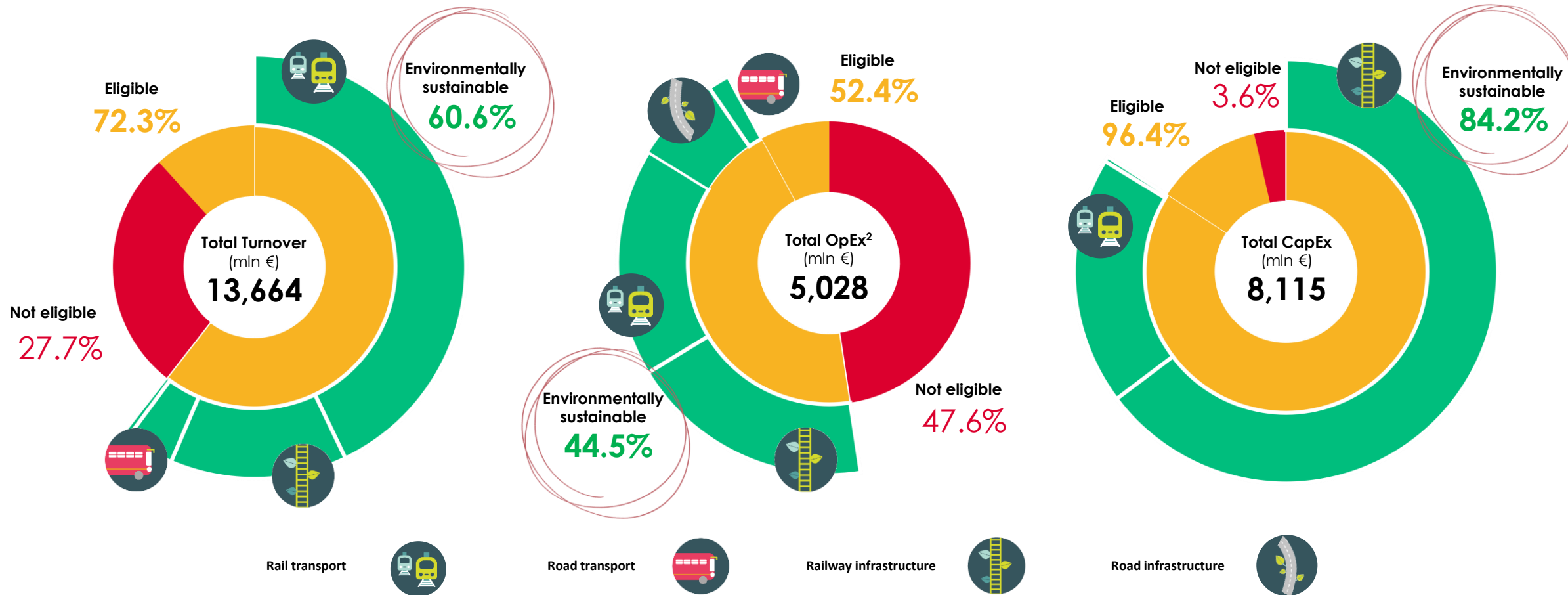
ENTITY	SCORE
	Climate Change "A-"
	Advanced
	ESG Low Risk
	Average
	7th place out of 90

European Taxonomy

Turnover, Capex and Opex

In accordance with **EU Regulation 852/2020 (EU Taxonomy)** below is summarized the performance of the Group with regard to the shares of **2022 Turnover, Opex, and Capex¹ aligned to the two objectives of climate change mitigation and adaptation.**

- ✓ A total of **60.6%** of consolidated **turnover** is Taxonomy aligned
- ✓ A total of **44.5%** of consolidated **operating expenses** is Taxonomy aligned
- ✓ A total of **84.2%** of consolidated **capital expenditure** is Taxonomy aligned



¹Results refer to the share of turnover, operating expenses, and capital expenditures not related to intercompany activities.

² Total Opex as identified by the Delegated Regulations paragraphs 1.1.3.1. - 1.1.3.2

Green Bond Framework Summary



FS Green Bond Framework updated in 2022



First Green Bond Framework established in 2017. In 2022 FS has enlarged the list of Eligible Green Projects.



All the EGP are aligned with the EU Taxonomy categories

- Potential KPIs:
- Energy efficiency
 - Reducing CO₂ emissions
 - Modal shift vs railway

← **Eligible Green Projects**

↗ Look-back period: 2 years (vs. 3 years of the previous update)

↘ Look-forward period: 2 years

Trenitalia electric passenger trains and maintenance of the electric rolling stock.



MIR electric locos and freight wagons and related maintenance



RFI electric HS infrastructure and maintenance of the railway lines.



Green Bond Framework – SDGs Mapping

- The FS Green Bond Framework addresses 3 of 17 **UN Sustainable Development Goals**.
- The mapping has been inspired by the **ICMA high-level mapping to SDGs** and existing practices of issuers of Green Bonds in the transportation sector.



SDG 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all



SDG 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport



SDG 12.2: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

SDG 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Best practice



In 2022 Sustainalytics provided a **Second Party Opinion** on the updated Green Bond Framework, certifying its alignment to the EU Taxonomy.



FS obtained the **Climate Bonds certification** for second, third and fourth green issuances.



KPMG provided a **Third Party Opinion** on the 2021 Green Bond Report.

*“Ferrovie demonstrates a commitment to sustainability through its sustainability strategy, which is underpinned by three pillars: (i) **energy and emissions**, (ii) **sustainable mobility**, and (iii) **safety**”*

*“Sustainalytics is of the opinion that Ferrovie has implemented **adequate measures** and is **well-positioned to manage and mitigate environmental and social risks** commonly associated with the eligible categories.”*

*“Ferrovie dello Stato Italiane Green Bond Framework is aligned with the **overall sustainability strategy** of the Group and that the green use of proceed category will contribute to the advancement of the **UN Sustainable Development Goals 9, 11 and 12**”*

FS's Green Issuances and Reporting perimeter

- Series 7's reporting already made in 2018 after full allocation of the net proceeds, no more reporting is due unless material changes occur.
- Due to CBI certification (cfr. slide 13), reporting for Series 10, 17, 18, 19 and 20 is required on an annual basis.
- Reporting activity for Series 19 and 20 is still ongoing and will be released one year after each issuance.

FS's Green Bond	Issue Date	Allocation	Reporting
EMTN Series 7	7/12/2017	100%	Once until full allocation
EMTN Series 10	09/07/2019	100%	Annually
EMTN Series 17	25/03/2021	100%	Annually
EMTN Series 18	23/12/2021	100%	Annually
EMTN Series 19	20/07/2022	100%	Once until full allocation
EMTN Series 20	14/09/2022	100%	Annually

Allocation and Impact Reports

Green Bond Series 10, 17 and 18



Description of the issuances

- Carry on the Group's sustainability path for a clean transport including the freight sector among the Eligible Green Projects;
- 3.5x oversubscription with Eur 2.5 billion orders coming from 160 investors, of which around 50% from SRI investors;
- Final spread at the tighter end of the guidance, at m/s+128bps (equivalent to BTPs -16bps), fixing the final size at EUR 700m;
- First Italian bond CBI Certified.



- Investments in both local and high speed transport among the Eligible Green Projects;
- 1.8x oversubscription with Eur 1.8 billion orders coming from 90 investors, of which around 75% from SRI investors
- Final spread at the tighter end of the guidance, at m/s+60bps, fixing the final size at EUR 1 bn
- CBI Certified.



- Investments in high speed transport among the Eligible Green Projects
- First Green Bond underwritten by EIB.
- CBI Certified.



	Series 10	Series 17	Series 18
Issuer	Ferrovie dello Stato Italiane SpA	Ferrovie dello Stato Italiane SpA	Ferrovie dello Stato Italiane SpA
Issue Type	Green Bond	Green Bond	Green Bond
Issuer Rating (at Issue)	BBB / BBB (S&P / Fitch)	BBB / BBB (S&P / Fitch)	BBB / BBB (S&P / Fitch)
Format	Senior Unsecured, Reg S Bearer	Senior Unsecured, Reg S Bearer	Senior Unsecured, Reg S Bearer
Amount	Euro 700m	Euro 1,000m	Euro 350m
Issue Date	09 July 2019	25 March 2021	23 December 2021
Maturity Date	09 July 2026	25 March 2028	23 December 2038
Coupon	1.125%	0.375%	Euribor 6 months + 0.62%
Reoffer Price / Yield	99.967 / 1.130%	99.491 / 0.449%	n.a.
Reoffer Spread	m/s+ 128bps	m/s+ 60 bps	n.a.
Listing / Docs	Irish Stock Exchange / Green Bond Framework/ EMTN	Irish Stock Exchange / Green Bond Framework / EMTN	Irish Stock Exchange / Green Bond Framework / EMTN

Allocation of the Proceeds

100% proceeds (Euro 2,050 million) allocated at the issue date, via intercompany loan from FS, the issuer, to Trenitalia and Mercitalia Rail



Ultimate Beneficiary Company	Eligible Green Project	Issuance	Asset's Value (€/mn)	Unit of vehicle funded (equivalent)
Trenitalia	REGIONAL - POP AND ROCK TRAIN	10	463.77	53
		17	834.58	108
	HIGH SPEED – FRECCIAROSSA 1000 TRAIN	10	117.60	3
		17	166.79	5
		18	351.36	10
Mercitalia Rail	ELECTRIC LOCOMOTIVE E494		103.60	40
	WAGON SHIMMNS	10	14.30	140

2,052.00
100% financing
of new projects

359

Impact reporting as of year end 2022 - environmental performance

«train vs. train» approach (as of 2022)



Ultimate Beneficiary Company	Eligible Green Project	Issuance	Unit of vehicle funded (equivalent)	Energy Saving MWh	Baseline GHG emissions tCO2	Total GHG emissions tCO2	Total GHG emissions avoided tCO2	Total GHG emissions avoided %
Trenitalia	REGIONAL - POP AND ROCK TRAIN ⁽¹⁾	10 ⁽⁴⁾	53	91,537	139,488	110,526	-28,962	-20.76%
		17 ⁽⁵⁾	108	64,257	92,066	74,230	-17,837	-19.4%
	HIGH SPEED – FRECCIAROSSA 1000 TRAIN ⁽²⁾	10 ⁽⁴⁾	3	17,712	27,365	21,762	-5,602	-20.47%
		17 ⁽⁵⁾⁽⁶⁾	5	10,779	0	0	-	-
		18 ⁽⁶⁾⁽⁷⁾	10	-2.665	0	0	-	-
Mercitalia Rail	ELECTRIC LOCOMOTIVE E494 ⁽³⁾		40	6,049	65,708	63,794	-1,913	-2.91%
	WAGON SHIMMNS ⁽³⁾	10 ⁽⁴⁾	140	102	1,321.6	1,289.5	-32.1	-2.44%

⁽¹⁾ Data related to the POP and ROCK are estimates based on the values stated by the suppliers in the tender procurement process according to the European technical specification TS 50591 “Specification and verification of energy consumption for railway rolling stock”. The baseline for the calculation of energy saving and avoided GHG emissions is the market average for comparable trains in operation stated by the suppliers in the tender procurement process.

⁽²⁾ Data related to the ETR1000 are actual as the fleet is full in operation. The baseline for the calculation of energy saving and avoided GHG emissions is the previous generation High-Speed train “ETR 500” with 9 coaches in the fleet of Trenitalia.

⁽³⁾ Data related to the freight fleet are actual. The baseline for the calculation of energy saving and avoided GHG emissions are the last locomotive and wagon purchased, before these one, by Mercitalia Rail.

⁽⁴⁾ Data refer to 4 years time period (2019-2022)

⁽⁵⁾ Data refer to 3 years time period (2020-2022)

⁽⁶⁾ Data are related only to energy saving due to the fact that the trains will be in service in Spain where traction energy comes 100% from renewable sources, therefore without CO2 emissions.

⁽⁷⁾ Trains started running commercial services from 25/11/22. Data includes the preliminary activities carried out in the first half of the year

Third Party Opinion



KPMG S.p.A.
Revisione e organizzazione contabile
Via Curtatone, 3
00185 ROMA RM
Telefono +39 06 80961.1
Email it-fmaudit@kpmg.it
PEC kpmgsa@pec.kpmg.it

Independent auditors' report on the Green Bond Report

*To the Board of Directors of
Ferrovie dello Stato Italiane S.p.A.*

We have been engaged to perform a limited assurance engagement on the Allocation of the Proceeds data and on the environmental performance data resulting from green projects financed with the Green Bonds (as defined below) included in the Green Bond Report - May 2023 (the "Report") of Ferrovie dello Stato Italiane S.p.A. (the "Company") prepared on the basis of the Green Bond Framework - June 2022 and available on the Company's website (the "Framework"), developed by the Company in accordance with the Green Bond Principles 2021 issued by the International Capital Market Association - ICMA (the "Principles") related to the Green Bonds issued on 9 July 2019 (EMTN Series 10), on 25 March 2021 (EMTN Series 17) and on 23 December 2021 (EMTN Series 18) (the "Green Bonds").

Responsibilities of the Company's Directors for the Report

The Directors are responsible for the preparation of the Report in accordance with the Framework, developed by the Company in accordance with the Principles. In particular the Directors are responsible for the preparation of the Allocation of the Proceeds data in accordance with the eligible green projects categories and of the environmental performance data resulting from green projects financed with the Green Bonds included in the Report as described in the "Green Bond Framework Summary" paragraph of the Report.

The Directors are also responsible for such internal control as they determine is necessary to enable the preparation of a Report that is free from material misstatement, whether due to fraud or error. It also includes identifying the content of the Report, selecting and applying policies, and making judgments and estimates that are reasonable in the circumstances.

Auditors' independence and quality control

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants (including International Independence Standards) (IESBA Code) issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour. Our firm applies International Standard on Quality Control 1 (ISQC Italia 1) and, accordingly, maintains a system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Auditors' responsibility

Our responsibility is to express a conclusion, based on the procedures performed, about the preparation of the Allocation of the Proceeds data and of the environmental performance data resulting from green projects financed with the Green Bonds included in the Report in accordance with the "Green Bond Framework Summary" paragraph of the Report.

Third Party Opinion



Ferrovie dello Stato Italiane S.p.A.
Independent auditors' report
12 May 2023

We carried out our work in accordance with the criteria established by "International Standard on Assurance Engagements 3000 (Revised) - Assurance Engagements other than Audits or Reviews of Historical Financial Information" ("ISAE 3000 Revised"), issued by the International Auditing and Assurance Standards Board applicable to limited assurance engagements. This standard requires that we plan and perform the engagement to obtain limited assurance about whether the Report is free from material misstatement. A limited assurance engagement is less in scope than a reasonable assurance engagement carried out in accordance with ISAE 3000 Revised, and consequently does not enable us to obtain assurance that we would become aware of all significant matters and events that might be identified in a reasonable assurance engagement.

The procedures we performed on the Report are based on our professional judgement and include inquiries, primarily of the Company's personnel responsible for the preparation of the information presented in the Report, documental analyses, recalculations and other evidence gathering procedures, as appropriate.

Specifically, we carried out the following main procedures:

- reviewing the second party opinion;
- evaluating the design and implementation of the reporting processes and the controls regarding the Allocation of the Proceeds data and the environmental performance data;
- interviewing relevant staff at corporate and business level responsible for the Green Bonds management and reporting;
- interviewing relevant staff at corporate and business level responsible for providing and consolidating the Allocation of the Proceeds data and the environmental performance data;
- evaluating internal and external documentation, based on sampling, to determine whether the Allocation of the Proceeds data is supported by sufficient evidence in line with the eligible green projects and the environmental performance data resulting from green projects financed with the Green Bonds is prepared in line with the methodology included in the Framework.

Conclusion

Based on the procedures performed, nothing has come to our attention that causes us to believe that the Allocation of the Proceeds data and the environmental performance data resulting from green projects financed with the Green Bonds included in the Green Bond Report - May 2022, are not prepared, in all material respects, in accordance with the "Green Bond Framework Summary" paragraph of the Report.

Rome, 12 May 2023

KPMG S.p.A.

Gabriele de Gennaro
Director of Audit

Other ESG indicators – EU Taxonomy assessment

Summary of Alignment with the EU Taxonomy– Screening criteria

Eligible Green Project	Substantial contribution to	Taxonomy activity	EU Technical Screening Criteria	Alignment with Technical Screening Criteria
REGIONAL - POP AND ROCK TRAIN HIGH SPEED - FRECCIAROSSA1000 TRAIN	Climate change mitigation	Passenger interurban rail transport	<p>The activity complies with one of the following criteria:</p> <p>(a) the trains and passenger coaches have zero direct (tailpipe) CO₂ emissions;</p> <p>(b) the trains and passenger coaches have zero direct (tailpipe) CO₂ emission when operated on a track with necessary infrastructure, and use a conventional engine where such infrastructure is not available (bimode).</p>	<p>Eligible green projects fulfill criteria a).</p> <p>Regional trains “Pop & Rock” and High speed trains “ETR 1000” are electric and they have zero direct (tailpipe) CO₂ emissions.</p>
ELECTRIC LOCOMOTIVE E494 WAGON SHIMMNS	Climate change mitigation	Freight rail transport	<p>The activity complies with one or both of the following criteria:</p> <p>(a) the trains and wagons have zero direct tailpipe CO₂ emission;</p> <p>(b) the trains and wagons have zero direct tailpipe CO₂ emission when operated on a track with necessary infrastructure, and use a conventional engine where such infrastructure is not available (bimode).</p> <p>2. The trains and wagons are not dedicated to the transport of fossil fuels.</p>	<p>Eligible green projects fulfill criteria a).</p> <p>Locomotives are electric and they have zero direct (tailpipe) CO₂ emissions.</p> <p>Trains and wagons are not dedicated to the transport of fossil fuels.</p>

Other ESG indicators – EU Taxonomy assessment

Summary of Alignment with the EU Taxonomy– Do Not Significant Harm «DNSH» criteria

Eligible Green Project	Taxonomy activity	Environmental objectives	DNSH Criteria	Alignment with DNSH Criteria
REGIONAL - POP AND ROCK TRAIN HIGH SPEED - FRECCIAROSSA1000 TRAIN ELECTRIC LOCOMOTIVE E494 WAGON SHIMMNS	Passenger interurban rail transport Freight rail transport	Climate change adaptation	Climate risk and vulnerability assessment	<p>Ferrovie dello Stato has a risk management approach that covers climate change adaptation. Consistently with the best practices (e.g. EU Climate ADAPT – The Adaptation Support Tool), FS Group indeed considers adaptation as a way to minimize climate change risk. Ferrovie dello Stato is a TCFD (Task Force on Climate-Related Financial Disclosures) supporter since May 2021, and its climate change risk management process aims to identify and evaluate climate hazards and the related adaptation measures according to best practices. In 2020, the Group set up an intercompany Program Team in order to define a tool to evaluate climate hazards (physical risks) and to develop an infrastructure adaptation plan. The Program Team carried out a first pilot project for climate vulnerability assessment and physical risk modeling to identify the areas with the greatest exposure to climatic events from a perspective view. The assessment used the Representative Concentration Path (RCP) scenarios adopted by the Intergovernmental Panel on Climate Change (IPCC).</p> <p>In 2022, to identify the share of turnover, operating expenses, and capital expenditures aligned with the objectives of the EU Taxonomy Regulation, the Group provided companies with a tool for climate analysis and vulnerability assessment of main assets to identify the related adaptation measures in the so-called Adaptation Catalogue. The tool allows to i) identify the prevailing asset types (i.e., rolling stock, vehicles, buildings, ships, etc.); ii) identify the climate hazards that can potentially affect the assets (in line with Appendix A of the Technical Annex of Delegated Regulation EU 2021/2139); iii) evaluate the degree of vulnerability of the prevailing asset to the climate hazard; iv) identify physical and non-physical solutions (adaptation solutions) that help reduce the effects of the hazards that weight on the specific economic activity.</p>

Other ESG indicators – EU Taxonomy assessment

Summary of Alignment with the EU Taxonomy– Do Not Significant Harm «DNSH» criteria

Eligible Green Project	Taxonomy activity	Environmental objectives	DNSH Criteria	Alignment with DNSH Criteria
REGIONAL - POP AND ROCK TRAIN	Passenger interurban rail transport	Transition to a circular economy	Measures are in place to manage waste in accordance with the waste hierarchy, in particular during maintenance	<p>The Group's main subsidiaries are ISO 14001:2015 Environment Management System (EMS) certified. The guidelines of EMS are applied to all operations including, procurement of goods and services, waste management, water management, preparation of train and crew, and shunting and maintenance of trains, wagons and locomotives.</p> <p>The Group's waste management policy is included in the EMS and the generated waste is managed in accordance with the waste management hierarchy while ensuring compliance with national and European regulations.</p> <p>The ETR1000 passenger train obtained the Environmental Product Declaration (EPD) which shows that the Frecciarossa 1000 emits only 28 grams of CO₂ per passenger per kilometer.</p>
HIGH SPEED - FRECCIAROSSA1000 TRAIN				
ELECTRIC LOCOMOTIVE E494	Freight rail transport	Pollution prevention and control	Engines for the propulsion of railway locomotives (RLL) and engines for the propulsion of railcars (RLR) comply with emission limits set out in Annex II to Regulation (EU) 2016/1628 of the European Parliament and of the Council	<p>All trains and locomotives are electric and do not have any direct emissions related to combustion.</p> <p>Trains operating in Spanish high-speed services have no CO₂ emissions since traction energy comes 100% from renewable sources.</p>
WAGON SHIMMNS				

Other ESG indicators – EU Taxonomy

Summary of Alignment with the EU Taxonomy - Minimum safeguards assessment

Eligible Green Project	Minimum safeguards
ALL	<p>FS Italiane promotes the protection of human rights for its employees, customers, citizens, suppliers and business partners, helping create a responsible supply chain and operating in accordance with the United Nations' Universal Declaration of Human Rights and the fundamental conventions of the International Labour Organization.</p> <p>The principles on which the Group operates include respect for human rights and the commitment to contribute to the creation of a responsible supply chain, also established in the Code of Ethics (which guides the Group in its relationships with stakeholders). Furthermore, the Group promotes open and inclusive employment relationships and rejects any type of discrimination or harm against people, prevents any form of illegal labour and endorses policies aimed at the psychological and physical well-being of personnel. Since 2017, the Group has joined the UN's Global Compact ("GC") network.</p>

4 Green Bonds for a total Eur 2.65 bn issued until December 2021

Total allocation and environmental impact (Series 10, 17 and 18)

NEW REGIONAL ELECTRIC TRAINS "POP" AND "ROCK"



€1,298 million



161 trains



Total 54,346 tCO₂ saved * in the period 2019-2022 thanks to the Series 10, 17 and 18

NEW HIGH SPEED ELECTRIC TRAINS "ETR1000"



€634 million



18 trains



NEW ELECTRIC LOCOMOTIVES AND WAGONS



€118 million



40 locomotives
140 wagons



Furthermore, the **Bond issuance Series 7** allocated **€549.64 million** and **€49.78 million** to fund respectively **17** High Speed Electric Trains "ETR1000" and **7** Regional Electric Trains "POP" and "ROCK". Total **13,491 tCO₂ saved*** in 2018 thanks to the Series 7.

Allocation & impact report details



Series 10 allocation of the Proceeds

100% proceeds allocated at the issue date, via intercompany loan from FS, the issuer, to Trenitalia and Mercitalia Rail

PROCEEDS ALLOCATION

ELIGIBLE GREEN PROJECT	Trains' value	Unit of vehicle funded (equivalent)
1. Investments in public passenger transport rolling stock renewal		
New Electric Multiple Unit (EMU) Trains For Regional Passenger Transport: "Pop" and "Rock"	€ 463.77 million	53
New High Speed Trains "Frecciarossa1000"	€ 117.60 million	3
2. Investments in freight transport rolling stock renewal		
New Electric Locomotives For Freight Transport	€ 103.6 million	40
New Wagons For Freight Transport	€ 14.3 million	140
TOTAL NET PROCEEDS	€ 699,279,000	100% financing of new projects

Series 10 impact reporting as of year end 2022 - environmental performance



Passenger transport «train vs. train» approach (2019-2022)

Project Category	Eligible Green Project	Year	Unit of Vehicle funded	Energy Saving MWh	Baseline GHG emissions tCO2	Total GHG emissions tCO2	Total GHG emissions avoided tCO2	Total GHG emissions avoided %
Investments in public passenger transport rolling stock renewal	REGIONAL - POP AND ROCK TRAIN ⁽¹⁾	2019	53	24,944	38,729	30,837	-7,892	-20.40%
		2020		18,257	26,979	21,203	-5,776	-21.41%
		2021		24,114	36,722	29,092	-7,630	-20.78%
		2022		24,222	37,058	29,394	-7,664	-20.68%
		Total		53	91,537	139,488	110,526	-28,962
	HIGH SPEED – FRECCIA ROSSA1000 TRAIN ⁽²⁾	2019	3	6,035	9,324	7,415	-1,909	-20.50%
		2020		2,771	4,281	3,404	-876	-20.48%
		2021		3,184	4,919	3,912	-1,007	-20.48%
		2022		5,722	8,841	7,031	-1,810	-20.48%
		Total		3	17,712	27,365	21,762	-5,602

➤ Data refer to 4 years time period (2019-2022)

⁽¹⁾ Data related to the POP and ROCK are estimates based on the values stated by the suppliers in the tender procurement process according to the European technical specification TS 50591 “Specification and verification of energy consumption for railway rolling stock”. The baseline for the calculation of energy saving and avoided GHG emissions is the market average for comparable trains in operation stated by the suppliers in the tender procurement process.

⁽²⁾ Data related to the ETR1000 are actual as the fleet is full in operation. The baseline for the calculation of energy saving and avoided GHG emissions is the previous generation High-Speed train “ETR 500” with 9 coaches in the fleet of Trenitalia.

Series 10 impact reporting as of year end 2022 - environmental performance



Freight transport «train vs. train» approach (2020-2022)

Project Category	Eligible Green Project	Year	Unit of Vehicle funded	Energy Saving MWh	Baseline GHG emissions tCO2	Total GHG emissions tCO2	Total GHG emissions avoided tCO2	Total GHG emissions avoided %	
Investments in freight transport rolling stock renewal	ELECTRIC LOCOMOTIVE E494 ⁽¹⁾	2020		994	10,797	10,482	-314	-2.91%	
		2021	40	2,580	28,030	27,213	-816	-2.91%	
		2022		2,475	26,881	26,098	-783	-2.91%	
		Total	40	6,049	65,708	63,794	-1,913	-2.91%	
	WAGON SHIMMNS	2020			32	417.0	406.9	-10.1	-2.44%
		2021	140		37	475.0	463.4	-11.6	-2.44%
		2022			33	429.6	419.2	-10.4	-2.44%
		Total	140	102	1,321.6	1,289.5	-32.1	-2.44%	

➤ Data refer to 3 years time period (2020-2022)

⁽¹⁾Data related to the freight fleet are actual. The baseline for the calculation of energy saving and avoided GHG emissions are the last locomotive and wagon purchased, before these one, by Mercitalia Rail.

Series 10: Note on Calculation Methodology

GHG EMISSION

GHG emissions of the EGPs (tCO₂⁽¹⁾)

=

[Annual average consumption (MWh) of the relevant train] X [CO₂ emission factor (gCO₂/kWh)]/1000

- The **Annual Average Consumption** is actual or estimate depending on the deployment status of project ⁽²⁾
- The **CO₂ Emission Factor** (316.4 gCO₂/kWh) is the CO₂ emission factor related to the Italian electricity production mix as calculated by ISPRA⁽³⁾

(1): Location-based approach. CO₂ emission are included, other gas (CH₄ e N₂O) are not included (less than 1%)

(2): Refer to the previous slide for detail on each project

(3): Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) Reports 303/2018, "Atmospheric emission factors of greenhouse gases in the national electricity sector and in the main European countries" (Table 2.4, p., 32, Gross electricity production year 2017)

Series 17 allocation of the Proceeds

100% proceeds allocated at the issue date, via intercompany loan from FS to Trenitalia

PROCEEDS ALLOCATION

ELIGIBLE GREEN PROJECT	Trains' value	Unit of vehicle funded (equivalent)
1. New Electric Multiple Unit (EMU) Trains For Regional Passenger Transport: "Pop" and "Rock"	€ 834.58 million	108
2. New High Speed Trains "Frecciarossa1000"*	€ 166.79 million	5
TOTAL € 1,001.37 million		113
100% financing allocated		

*Trains operating in both Italian and Spanish high speed services.



Series 17 impact reporting as of year end 2022 - environmental performance

«train vs. train» approach

Project Category	Eligible Green Project	Year	Unit of Vehicle funded	Energy Saving MWh	Baseline GHG emissions tCO2	Total GHG emissions tCO2	Total GHG emissions avoided tCO2	Total GHG emissions avoided %
Investments in public passenger transport rolling stock renewal	REGIONAL - POP AND ROCK TRAIN (1)	2021	108	27,309	38,942	31,362	-7,581	-19.5%
		2022		36,948	53,124	42,868	-10,256	-19.3%
		Total		64,257	92,066	74,230	-17,837	-19.4%
	HIGH SPEED - FRECCIAROSSA1000 TRAIN (2)	2021	5	9,447*	0	0	-	-
		2022		1,332**	0	0	-	-
		Total		10,779	0	0	-	-

(1) Data related to the POP and ROCK are estimates based on the values stated by the suppliers in the tender procurement process according to the European technical specification TS 50591 "Specification and verification of energy consumption for railway rolling stock".

(2) Data are related only to energy saving due to the fact that the trains will be in service in Spain where traction energy comes 100% from renewable sources, therefore without CO₂ emissions.

* Data estimated considering fully operational services.

** Trains started running commercial services from 25/11/22. Data includes the preliminary activities carried out in the first half of the year.

Series 18 allocation of the Proceeds

100% proceeds allocated at the issue date, via intercompany loan from FS to Trenitalia

PROCEEDS ALLOCATION		
ELIGIBLE GREEN PROJECT	Trains' value	Unit of vehicle funded (equivalent)
2. New High Speed Trains "Frecciarossa1000" *	350.64	10
	100% financing allocated	10

*Trains operating in Spanish high speed services.

Series 18 impact reporting as of year end 2022 - environmental performance



«train vs. train» approach

Project Category	Eligible Green Project	Unit of Vehicle funded	Energy Saving MWh	Baseline GHG emissions tCO2	Total GHG emissions tCO2	Total GHG emissions avoided tCO2	Total GHG emissions avoided %
		2022	2022	2022	2022	2022	2022
Investments in public passenger transport rolling stock renewal	HIGH SPEED - FRECCIAROSSA1000 TRAIN (1)	10	-2.665*	0	0	-	-

1. Data are related only to energy saving due to the fact that the trains will be in service in Spain where traction energy comes 100% from renewable sources, therefore without CO₂ emissions.

* Trains started running commercial services from 25/11/22. Data includes the preliminary activities carried out in the first half of the year.

Series 17-18: Note on Calculation Methodology

GHG EMISSION

GHG emissions of the EGPs (tCO₂⁽¹⁾)

=

[Annual average consumption (MWh) of the relevant train] X [CO₂ emission factor (gCO₂/kWh)]/1000

- The **Annual Average Consumption** is actual or estimate depending on the deployment status of project ⁽²⁾
- The **CO₂ Emission Factor** (277.6 gCO₂/kWh) is the CO₂ emission factor related to the Italian electricity production mix as calculated by ISPRA⁽³⁾

(1): Location-based approach. CO₂ emission are included, other gas (CH₄ e N₂O) are not included (less than 1%)

(2): Refer to the previous slide for detail on each project

(3): Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) «Emission factors for the production and consumption of electricity in Italy 19/01/2022» (tab 14, column "Gross electricity production year 2019»)

Appendix



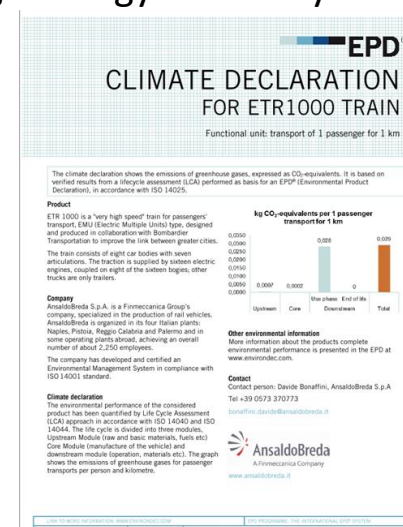
EGP - New Regional Trains “Pop” & “Rock”

- New electric highly energy efficient trains both medium capacity (“Pop”) and high-capacity (“Rock”)
- Innovative technologies for energy efficiency (engines with natural ventilation, use of light alloys, LED lighting, CO₂ sensors for optimal climatization, smart parking mode, etc)
- Recyclability rate between 92% and 96%
- More bikes racks, with charging points for electric bikes
- Access to “White Certificate” mechanism (national incentives scheme for high energy efficiency investments) obtained on February 15th, 2017



EGP - New High Speed Trains "ETR 1000"

- The **ETR 1000**, named "**Frecciarossa 1000**" is the new electric high-speed train of Trenitalia, comfortable, safe and environmentally friendly, designed to meet the most advanced technology (ERTMS/ECTS traction control system)
- Extremely accurate **aerodynamic design** to minimize motion resistance
- High **efficiency of traction system**
- **Recyclability** rate over **94%**
- First HS train provided with **Environmental Product Declaration (EPD)**
- **Access to "White Certificate"** mechanism (national incentives scheme for high energy efficiency investments) obtained on December 1st, 2015



Focus EGP – New electric Locomotives and Wagons for freight transport

- **New electric locomotives “E494”** the latest model of the TRAXX family single-system locomotive, designed to **minimize energy consumption** and assures a significant efficiency improvement compared to the previous models
- **“Parking Mode”** and **“Eco-mode”** enable a very low energy consumption during the standstill and the use of the locomotive in the case of partial load reducing the vibration and noise level
- **Electrodynamic braking system** regenerates the energy to the overhead line, **magnetic components** with very high energy efficiency and **optimized cooling control** improve energy efficiency
- Oil free compressor and the new fire-fighting system reduce environmental impact



- **New wagons for coils transportation** are equipped with electronic monitoring devices for accident prevention solutions for coil fastening
- Lighter by 1400 kg
- Noise reduction with respect to existing wagons
- Wagons are equipped with electronic devices that allow to store data for “on condition maintenance” and to use each component for its entire useful life for a lower environmental impact

Contacts:

Stefano Pierini – Chief Finance & Investor Relations Officer

Tel.+39 06 44102348

Mail: s.pierini@fsitaliane.it

Vittoria Iezzi – Head of Debt Capital Market

Tel. +39 06 44106655

Mail: v.iezzi@fsitaliane.it

Riccardo Moscucci – Debt Capital Market

Tel. +39 06 44103618

Mail: r.moscucci@fsitaliane.it

Marco Marrone – Debt Capital Market

Mail: ma.marrone@fsitaliane.it

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