Ferrovie dello Stato Italiane group

ANNEX 3
COMPANY HIGHLIGHTS - THE ENVIRONMENT

CONTENTS

Company highlights

OUR APPROACH

Ferrovie dello Stato Italiane strives to incorporate the protection of the environment into the Group's strategies and activities by implementing a project aimed at reducing the transport sector's carbon footprint by maximising the environmental advantages of collective transport and favouring more sustainable vehicles and infrastructure. As the Parent, it will promote rational use of natural resources throughout the entire network of subsidiaries, focusing on the life cycle of products and services. In order to pursue this objective, it is essential to establish, carry out and monitor objectives which require the rational use of resources, the prevention and reduction of environmental risks, research into energy efficiency, and the promotion of renewable energy sources.

The environmental management policy and system guide the processes and actions towards continuous improvement, carefully and continuously developing natural capital by spreading awareness of environmental matters and actively supporting the monitoring of environmental impacts.

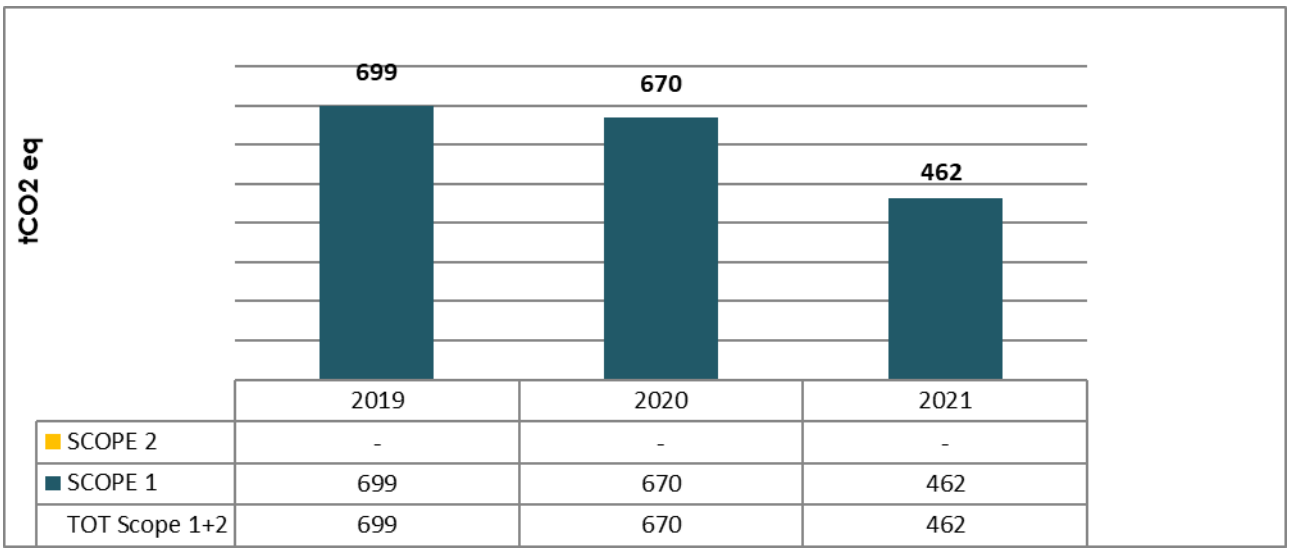
Final energy consumption

		2021	2020	2019
Electricity	MWh	4,545	4,686	5,629
with guarantee of origin or self-produced solar energy	%	100%	100%	100%
Natural gas	Sm^3	232,645	335,549	349,529
Total consumption	**GJ**	**24,339**	**28,378**	**32,251**

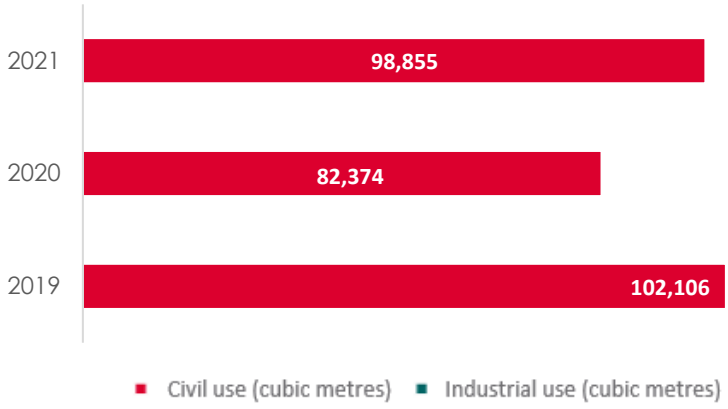
Comments on the trend

In 2021, there was a fall in electricity consumption and a considerable drop in natural gas consumption for heating due to employees working from home during the public health emergency starting from March 2020.
The Group continued to procure 100% of its electricity from renewable sources certified with guarantee of origin in 2021.

Total CO_2eq emissions (market-based)



Water

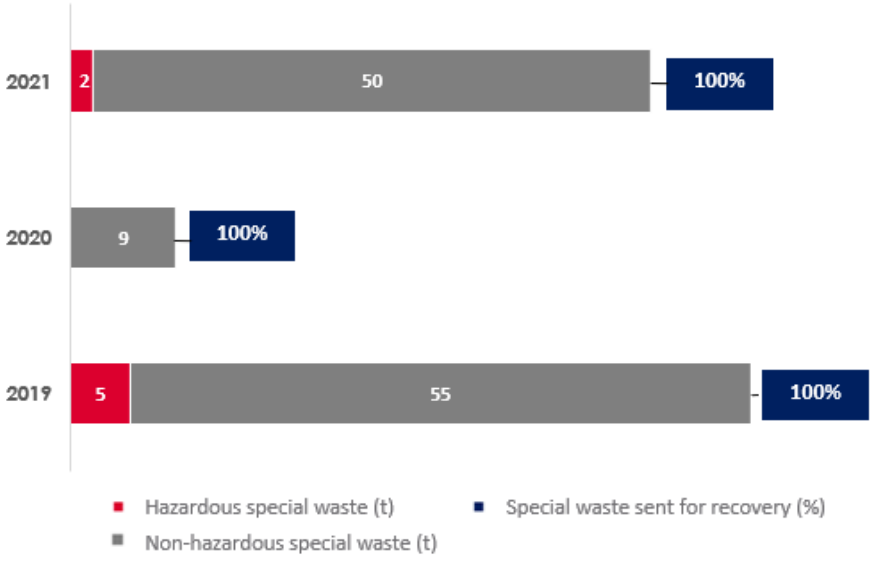


Comments on the trend

The figures in the table mainly refer to water withdrawals at the Villa Patrizi site in Rome.

The increase on 2020 is due to more frequent cleaning activities.

Waste



Comments on the trend

The figures in the table refer to hazardous and non-hazardous special waste produced by the Villa Patrizi site in Rome.

Most of the waste produced is non-hazardous special waste (IT equipment, furnishings and air conditioners) which rose considerably on 2020. However, such increase is in line with 2019, i.e., prior to the pandemic emergency.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Updating the Sustainability Committee, which acts as an **advisory board** to the group's CEO, **guaranteeing the integration of sustainability principles into business strategies.**	2021	+ culture and awareness + knowledge and commitment	✓	The CEO of Ferservizi joined the committee and contributed to the strategic plan. The Chief technology, innovation & digital officer and Chief international officer also joined the committee.
	Launch a new induction cycle on sustainability issues for management and members of the boards of directors of group companies. The training content of the programme for the boards of directors, aimed at promoting a business model that ensures balance between ESG components, will be broken down into two sessions: entry-level session for the boards who did not attend the previous induction, and deep dive session for the boards who did attend the induction organised by the parent in 2019-2020. The training content for managers aims to disseminate current fundamental content and give a systematic view of the group and the broader external context.	2022	+culture and awareness +knowledge and commitment		Both induction programmes will include the participation of an expert - a leading Italian and/or global expert with proven seniority and expertise - and group sector specialists.
	Include carbon efficiency targets in employee bonus policies.	2021	+ culture and commitment	✓	The remuneration policy is updated periodically: for 2021 one of the targets measures the ratio of economic value generated to CO_2 emissions produced.
	Define a methodology for **assessing the carbon footprint of investments**	2021	+ culture and awareness	✓	The methodology was issued in December 2021.
	Launch an engagement programme structured around three mini speeches given by leading figures on what it means to be sustainable.	2022	+ virtuous practices		
UPDATED	**Define an assessment model for economic, social and environmental issues** to apply to the group's main projects.	2022	+ shared value		A gap analysis on new ministry directives was rolled out.
	Tender a group contract for a "service aimed at developing and assisting the application of tools to **assess and check the sustainability profile of financial operators and suppliers of group companies**".	2021	+culture and awareness	✓	The tender was published in November 2021 and will be awarded in 2022.

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Define **guidelines for sustainable procurement management** with a view to standardising sustainability principles and drive their integration into purchasing procedures and management.		+ culture and awareness	✓	The group guidelines were issued in January 2021.
UPDATED	**Define a control model for data** on sustainability performance required for group reporting.	2022	+ control	📋	The guidelines for defining the control model will be formalised in 2022.
	Agree a new committed credit facility in which the interest and commitment fees are revised when the group reaches **targets related to the four sustainability-linked performance indicators** that act as a snapshot of its commitment to various ESG issues.	2021	+ shared value	✓	The facility was agreed in June 2021 for €2.5 billion.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

📋 in progress

✓ *completed*

OUR APPROACH

Trenitalia pledges to become a driving force in the sustainable development of the transport mobility, taking action on compliance with sustainability principles, aiming for ongoing improvement of its ESG (Environment, Social, Governance) profile and actively engaging its stakeholders.

Trenitalia considers the safety of railway operations, the quality of services provided, the protection of the environment, and the safeguarding of the health and safety of its workers as fundamental for all of its operations, as set out in its "Operating safety, quality, environment, occupational health and safety policy". To boost its effectiveness in this respect, Trenitalia has also adopted an integrated certified management system that conforms to the requirements of the ISO 45001, ISO 14001 and ISO 9001 standards and a management system to prevent and control the spread of infections as per Biosafety Trust Certification (BSC). The BSC protocols help, inter alia, minimise the risks of spreading the epidemic in areas of public and private gathering and ensure greater responsiveness in the event of accidental infection.

As for the energy efficiency of its trains, which are the main source of energy consumption, Trenitalia continues its work on upgrading the fleet, acquiring more energy-efficient trains and carrying out works to improve the efficiency of trains already in circulation (e.g., LED lighting, new air conditioning systems).

With regard to the energy efficiency of maintenance sites, in 2021, as in the previous five years, Trenitalia continued to advance its broad energy diagnosis campaign. The aim is to progressively improve the energy performance of its maintenance activities at its industrial plants, together with significant investments dedicated to implementing more efficient lighting systems (installing LED technology, building automation systems, etc.), redeveloping the energy supplies for compressed air and heat production and distribution systems, and producing energy from renewable sources (e.g., photovoltaic systems, solar thermal energy, etc.).

To protect water resources, the company has initiated a virtuous, long-term cycle at maintenance sites to streamline and contain water consumption.

Conscious of the impact of its supply chain, Trenitalia chose its suppliers by assigning significant weight to the environmental aspects of supply, production, use, disposal, recovery and recycling of goods and services. Roughly 70% of the economic value contracted for core purchases considered sustainability criteria in both tender applications and awards. In this way, Trenitalia encourages the development of virtuous practices to improve working conditions and reduce environmental impacts along the entire value chain.

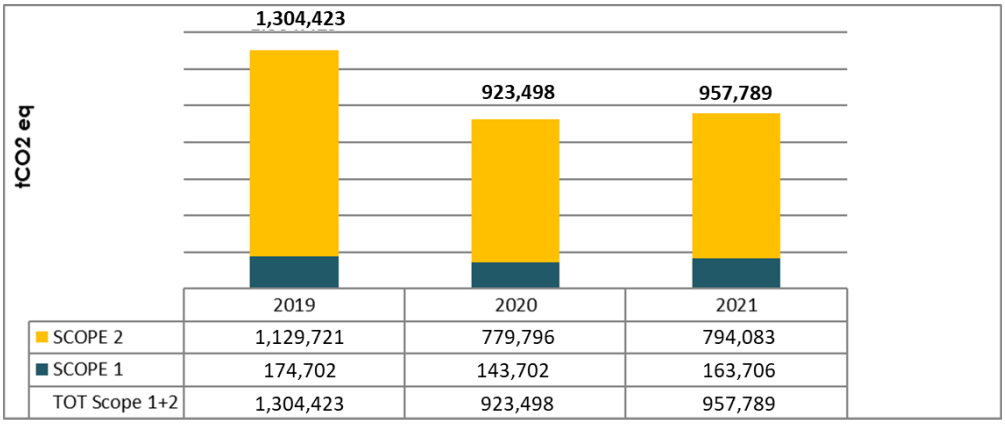
Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	2,838,001	2,603,680	3,534,353
Electricity for other uses	MWh	79,518	73,673	77,558
of which:				
- *with guarantee of origin or self-produced solar energy*		100%	100%	100%
- *self-produced and consumed solar energy*	MWh	4,076	2,322	220
Diesel	l	43,185,866	38,483,358	48,531,837
Natural gas	Sm^3	18,406,144	15,300,319	15,935,245
Other consumption	GJ	109	108	185
Total consumption	**GJ**	**12,699,799**	**11,558,386**	**15,308,866**

Comments on the trend

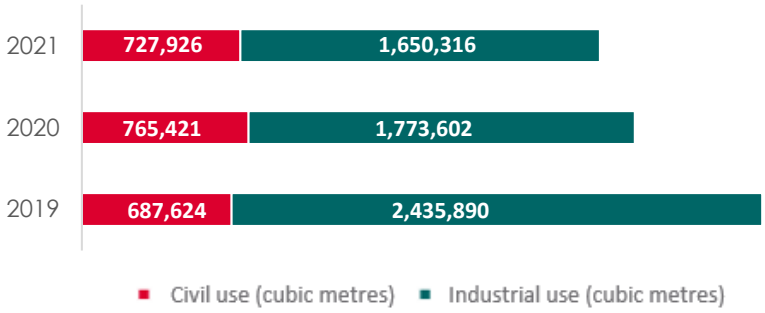
Energy consumption increased on 2020, for both electricity and natural gas and diesel, mostly used in rail operations. Though not yet back to pre-pandemic levels, the increase is due to production activities picking up again after the acute phase of the public health emergency. In addition, there was a considerable increase in natural gas consumption linked to the return to production activities at workshops (with expanded shifts and working hours to ensure the safety of workers at the sites) along with the conversion of systems previously fuelled by diesel. Furthermore, energy generated by photovoltaic systems for internal use approximately doubled in 2021 as new plants were installed or existing plants upgraded at company premises during the year.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	1,129,721	779,796	794,083
SCOPE 1	174,702	143,702	163,706
TOT Scope 1+2	1,304,423	923,498	957,789

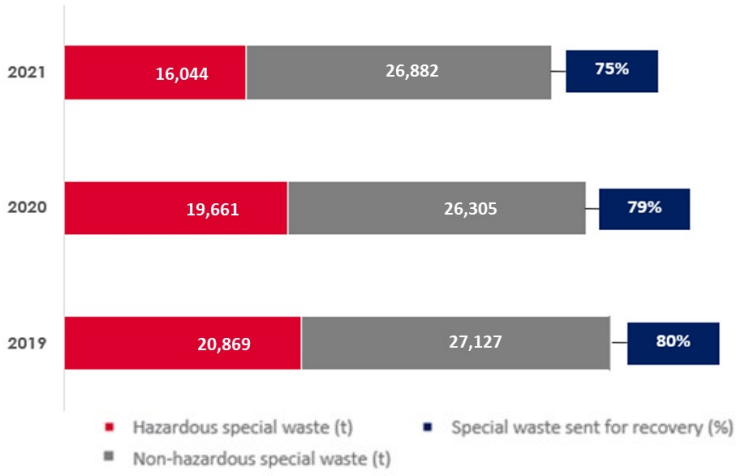
Water



Comments on the trend

Following on from the previous two years, water consumption continued to decrease thanks to the rationalisation of water networks and adoption of management, infrastructure and technological solutions to optimise the water cycle. Specifically, there was a 6% fall between 2020 and 2021 regarding withdrawals for both industrial use and civil use. This decrease is even more significant considering the growth in train-km production from 2020 to 2021.
A portion of the reduction is linked to physiological changes related to the type and volume of production activities carried out during the pandemic.

Waste



Comments on the trend

Overall waste produced was 6% lower than the previous year. Specifically, there was a significant 18% fall between 2020 and 2021 in hazardous special waste. This decrease is even more significant considering the growth in train-km production from 2020 to 2021 and the fact that maintenance, sanitisation, cleaning and tidying activities were stepped up during the year.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED Comparative study of electric-hydrogen via electric-battery bimodal trains.	Being finalised	+ innovation		Project in collaboration with CNIM, La Sapienza University, Mediterranea University and the University of Calabria.
	UPDATED Installation of **new LED lighting systems** on the fleet of **Vivalto NCDP** trains (i.e., those featuring the new double-decker carriages), **TAF** (trains operating the busiest routes), the **medium-haul carriages that have received face-lifts and the Intercity fleet**.	In progress 2022/2025	+ comfort - CO_2		This included replacing fluorescent bulbs with LED lighting on the **Vivalto NCDP fleet** when the trains are undergoing routine maintenance (**progress: 278 out of 288**). This activity began in late 2017 and is scheduled to be completed in 2022. Installation of new LED lighting systems on the **TAF** fleet is also scheduled to be completed in 2022 (**progress: 73 out of 74**). Installation began on the **medium-haul** fleet in 2019 and is expected to be completed in 2025. It will be carried out on all of the face-lifted carriages (1,210) when they are undergoing routine maintenance (**progress: 711 out of 1,210**). Installation of LED lighting on the **Intercity fleet** has covered **262 trains out of a total of 730 so far. It is expected to be completed at the end of 2025.**

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	NEW Improving the energy efficiency of the Intercity fleet: replacing the air conditioning systems on board the Intercity day fleet.	In progress 2023	+ comfort - CO_2		Progress: 20 trains out of 330
	UPDATED Installation of **new LED lighting systems** on the **Intercity day and night fleet.**	In progress 2025	+ comfort - CO_2		The project will replace the on-board lighting systems with LED technology for 262 Intercity night trains and 730 Intercity day trains.
	UPDATED The **new Pop** and **Rock trains for regional service** were purchased and placed in service.	In progress 2026	+ comfort - CO_2		The new **Pop and Rock** trains have updated the rolling stock used for the regional service in Italy to the next generation, boasting more **comfort, technological innovation and sustainability**. Indeed, these trains **consume 30% less energy than the most recent regional trains in circulation**, offer **integrated mobility features** (e.g., space on board for bicycles and charging stations) and are made out of up to **96% recyclable materials. A further 100 Pop and Rock trains were delivered in 2021**. 150 medium-capacity electric regional trains that travel up to 160 km/h were acquired in August 2021. These are Pop trains with some upgraded technological systems.
	UPDATED Purchase of **new regional diesel/electric Blues trains** designed for commuters**.**	In progress 2030	+ comfort - CO_2		The 90 plus new Blues trains are latest-generation **diesel-electric-battery hybrid trains**. They may run on diesel - when operating on diesel railway lines - or electricity when using pantographs on electric lines. Equipped with batteries, they can travel a few kilometres on non-electrified lines - for instance when entering and leaving stations - electrically to reduce pollutant emissions in cities. The master purchase order provides for

Scope	Description	Deadline	Average annual savings/target	Status	Notes
					the supply of up to 135 trains and deliveries will begin in 2022.
	 Installation and roll-out/upgrading of **new photovoltaic systems.**	2021/2022/2024	**7,602 MWh** **2,405 tCO_2**		The **installation/upgrading of various photovoltaic systems** was completed in 2021 (implemented at the Technical Department's Verona workshop and the Regional Business Department's Turin shunting site; upgraded at the Technical Departments' Florence Osmannoro workshop). **The installation and upgrading of various photovoltaic systems is scheduled for 2022** (implementation at the Naples HS site and upgrading at the Milan HS site, both pertaining to the High Speed Technical Department). **The installation and roll-out of photovoltaic systems** at the Technical Department's Foligno, Voghera and Foggia workshops is also planned for 2022. **In addition, numerous other photovoltaic systems are expected to be installed and rolled out around the country by 2024 (e.g., the Intercity Business Department sites in Turin, Reggio Calabria and Lecce and the Regional Department sites in Sulmona and Savona).**

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED **Installation of new solar thermal plants** at 9 maintenance sites.	2024	**84** tep **196** tCO_2		
	UPDATED **LED lighting** at **14** maintenance sites.	2024	**7,740** MWh **2,453** tCO_2		
	UPDATED **Installation of radiant strip heating systems at 6 maintenance sites.**	2024	**890** tep **2,102** tCO_2		The installation was already completed at the Regional Business Department's Turin site in 2021.
	**Rationalisation of water networks for industrial plants** and adoption of **management, infrastructure and technological solutions** to optimise water use.	2024	**0.43** litres of water/**train-km** **1.41** litres of water/**hours worked**		Completed in 2021: installation of motorised solenoid valves into the water supply system in Milan; engagement of a company to revamp the plumbing; installation of flow meters at the Trieste site; mapping of the plumbing and checking for leaks at Genoa and Savona; detailed mapping of the plumbing at the Verona hub. Completed the initiative to reduce water consumption at the industrial plants in Rimini and Voghera. In progress at the following Regional Departments: Friuli Venezia Giulia, Marche, Puglia, Sardegna, Veneto, Abruzzo and Calabria; and at the following sites: HS Naples, HS Rome, Turin, HS Mestre, Foligno, Foggia and Verona.
	**Rationalisation of the collection of waste** from industrial production and **awareness raising** for personnel and third-party firms on environmental management. Launch of an **internal awareness campaign** on sustainability issues for all employees with three main focuses: circular economy, sustainable mobility and energy. Target: create a culture of sustainability at all levels, spread awareness and stimulate virtuous conduct from an environmental and social viewpoint.	2024	**+1.2%** waste sent for recovery		Completed at the following sites: Rimini, Foggia. In progress at the following Regional Departments: Campania, Friuli Venezia Giulia, Liguria and Marche; and at the HS Rome site.
	NEW At the Rome current maintenance plant in 2021, in collaboration with the DLF (employee recreational club), drinking water dispensers linked to the water supply system were installed and aluminium water bottles were handed out, and the previous hot drink vending machines were replaced with plastic free vending machines that use paper cups and wooden stirrers.	2021	**650** kg less plastic	✓	

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED Maintaining **Biosafety Trust Certification (management system certification aimed at the prevention of the spread of infections).**	2023	**+ culture, awareness, knowledge and commitment**	✓	
	NEW Testing the use of eco-friendly products to remove graffiti from rolling stock at the Bolzano and Trento maintenance sites.	2023	**+ efficiency**		
	NEW **Reducing environmental risk** - Removal of objects containing asbestos (e.g., roofs, drainpipes, ventilation towers, etc.). Cleaning and removal of underground tanks.	2021	**+safety**		The removal of objects containing asbestos was completed at the Friuli V.G. and Calabria sites in 2020. It was completed in Liguria and Sicily in 2021. The cleaning and removal of three underground tanks is in progress in Puglia.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

✓ completed

Trenitalia's subsidiaries

Netinera group

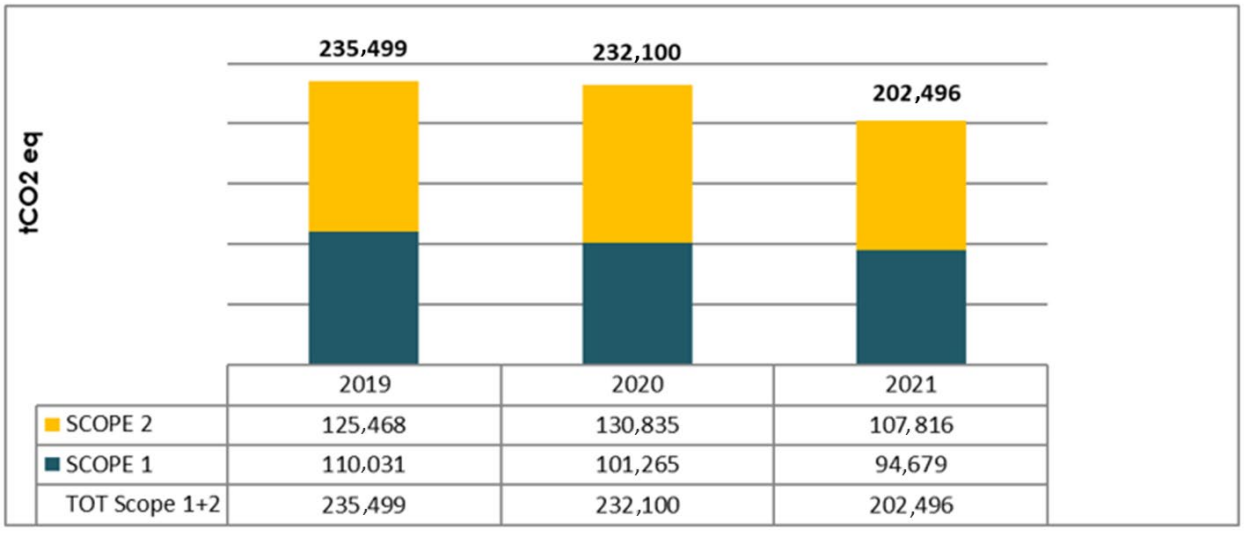
Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	168,570	173,089	162,797
Electricity for other uses	MWh	7,280	6,459	7,676
with guarantee of origin or self-produced solar energy	%	0%	0%	0%
Diesel	l	31,680,032	34,137,692	36,861,310
Natural gas	Sm^3	765,170	599,286	991,439
Other consumption	GJ	4,205	2,278	2,896
Total consumption	**GJ**	**1,811,627**	**1,906,323**	**1,986,397**

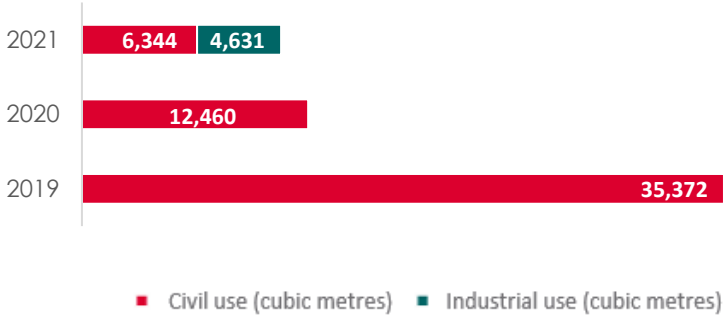
Comments on the trend

The increases in electricity for other uses and natural gas are due to operations gradually picking back up at the maintenance sites after the acute phase of the pandemic in 2020.
The harsher winter in 2021 also had an impact on natural gas consumption.
The consumption of electricity for railway traction and diesel remained more or less unchanged on the previous year.

Total CO_2eq emissions (market-based)



Water



Comments on the trend

The decrease in water consumption is partially due to the winding up of the subsidiary Autobus Sippel. A new calculation method was used in 2021 to divide consumption between civil and industrial use.

Waste

Comments on the trend

The increase in special waste produced in 2021 is mainly due to building works carried out at the group company OHE AG and works at the Bleckede site.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Idle reduction.	-	**-5%** fuel consumption		
	Reduction of traction power pack usage.	-	**-65%** traction power pack usage		
	Expansion of the service in Saarland under way with four lines of the Saar electric network (ENS). The services to be provided in the network were subject to two calls for tenders from all over Europe.	2024	- CO_2		The building of the individual stations was delayed due to the merger of Alstom and Bombardier Alstom (formerly Bombardier).
	**Use of battery-powered trains:** awarding the contract for the final sub-network. The final contract assigned in the call for tenders related to the future network of accumulators in Schleswig-Holstein. NBE nordbahn Eisenbahngesellschaft mbH & Co. KG was awarded the contract to operate the routes in Akkunetz Nord from December 2023: Kiel - Husum, Husum - Bad St. Peter Ording, Kiel - Flensburg.	2023	- CO_2		

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

completed

Trenitalia's subsidiaries

TrainOSE

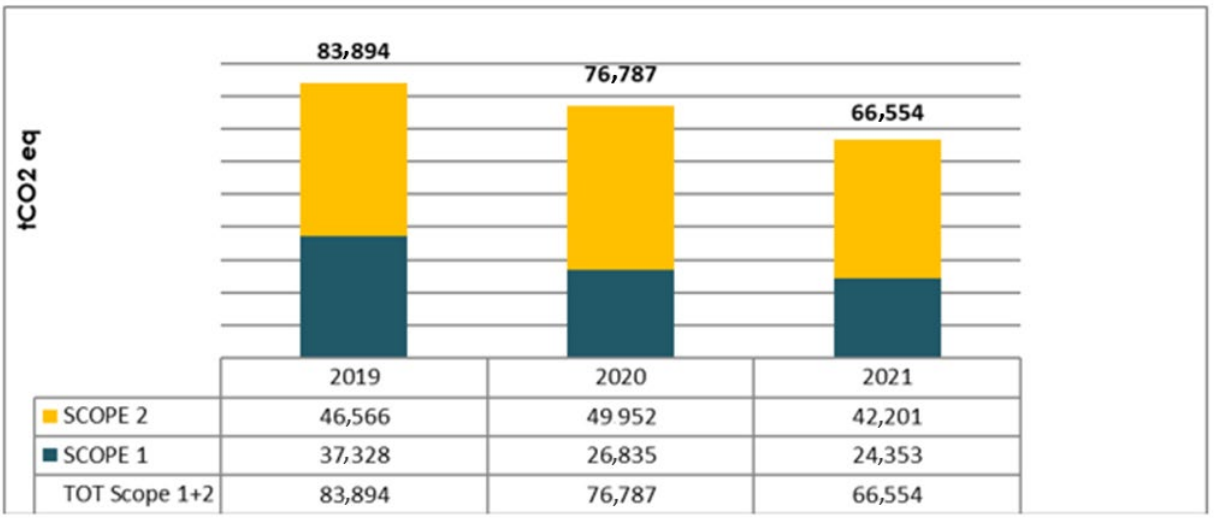
Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	64,384	66,347	67,992
Electricity for other uses	MWh	5,094	5,441	5,341
with guarantee of origin or self-produced solar energy	%	0%	0%	0%
Diesel	l	8,288,046	9,127,979	12,700,094
Other consumption	GJ	101	98	50
Total consumption	**GJ**	**550,638**	**589,400**	**724,391**

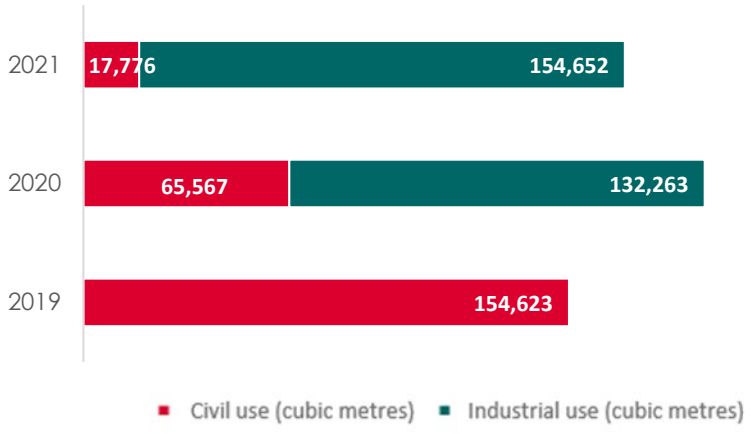
Comments on the trend

Energy consumption shows an overall slight decrease on the previous year, with diesel for railway traction recording the highest drop in percentage as an effect of services being reorganised during the public health emergency.

Total CO_2eq emissions (market-based)



Water



Comments on the trend

Water consumption decreased in line with energy consumption. A new calculation method was used in 2021 to divide consumption between civil and industrial use.

Waste

Comments on the trend

The increase is chiefly due to the disposal of waste accumulated over the years in 2021 and, to a lesser extent, scrap material produced from new activities (e.g., removing wood from freight wagons that contained hazardous substances).

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	A procedure was **formalised to better manage industrial waste at sites and mitigate the risk of polluting the environment.**	2021	+ culture	✓	The following activities were implemented during the year: • design of storage areas for hazardous waste at depots; • purchase and placement of recycle bins at the TrainOSE office; • monthly monitoring of water consumption; • removal of asbestos at the Salonicco, Larisa and Peiraius depots; • removal of sludge deriving from the treatment of sewage liquid waste at numerous depots (90 tonnes at Larisa).
	Digitalisation of paper tickets: e-tickets associated with new products and awards for passengers (e.g., 10% discount for e-tickets on mobile phones).	2023	- paper + digitalisation		
	**ISO 50001 certification was obtained** (energy management system) and the ISO 14001 **environmental management system was implemented.**	2022	+ culture		In 2021, a gap analysis was carried out and an Environmental and Energy Action Plan was developed at all TrainOSE sites in accordance with ISO 14001 and ISO 50001.
	SHIFT2RAIL DAYDREAMS: optimised maintenance of the railway infrastructure via AI.	2023	+ efficiency		Project financed by the European Union.
	**Replacement of most old air conditioning units with more efficient units at certain depots (e.g., Peiraius, Rentis).**	2021	+ efficiency	✓	
	**Upgrade and renovation of the Thessaloniki site to accommodate ETR 470 trains.**	2021	+ efficiency	✓	

	HORIZON2020 5G VICTORI project: increasing **energy from regenerative braking** by electric railway systems by coordinating rolling stock and HS substations.	2023	+ **efficiency**	Project financed by the European Union.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

completed

Trenitalia's subsidiaries

Trenitalia C2C

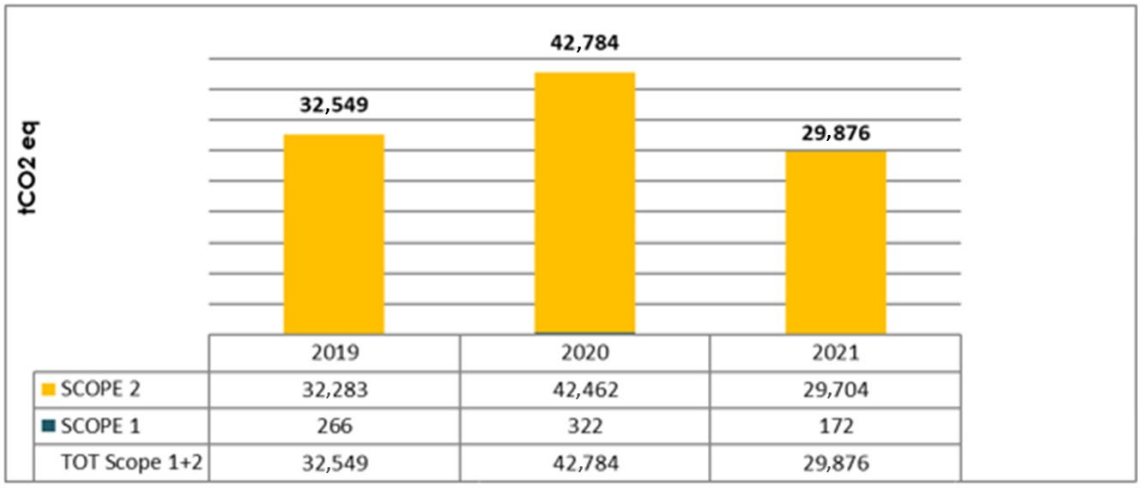
Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	79,185	104,653	80,401
Electricity for other uses	MWh	6,257	6,949	7,323
with guarantee of origin or self-produced solar energy	%	1%	2%	0%
Self-produced and consumed solar energy	MWh	61	141	0
Natural gas	l	86,561	161,236	132,956
Total consumption	**GJ**	**310,558**	**407,296**	**320,368**

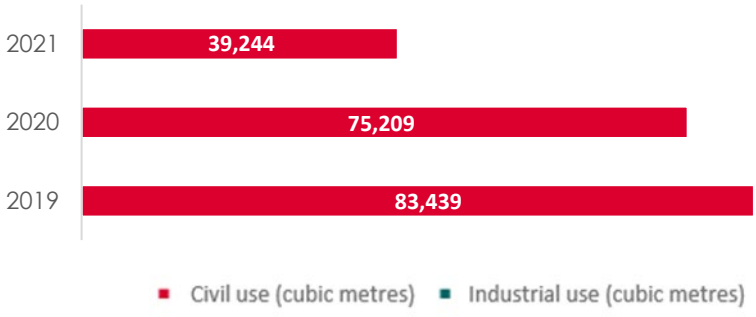
Comments on the trend

Electricity consumption for traction decreased on the previous year as an effect of services being reorganised during the public health emergency. In addition, there was a considerable drop in natural gas consumption following adjustment of consumption invoiced by the supplier in previous years.

Total CO_2eq emissions (market-based)



Water



Comments on the trend

The fall in water consumption is due to a leak in the water supply system at the Shoeburyness site being repaired.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	LED depot project, East Ham	2022	440 **MWh** 122 tCO_2		
	Upgrading the lighting system at the East Ham depot begun in September 2020 to reduce consumption during less busy times.	2021	32.85 **MWh** 8.3 tCO_2		

Key

Continuous

Raw materials cycle

Energy and emissions

Water cycle

Land

 in progress

 completed

OUR APPROACH

RFI's approach to operating national railway infrastructure focuses on boosting the network's value as a fundamental asset of Italy's mobility system and as a key part of improving the local society, economy and environment.

A focus on **environmental and social protection and regeneration in the areas where it operates** lies at the foundation of RFI's mission and is a common thread throughout all its production activities. To RFI, **sustainability** is not merely a criterion for the definition of specific initiatives, but is also a **systemic approach to all business aspects**, to creating shared value and contributing to the achievement of Sustainable Development Goals, also by designing and applying process and product innovation aimed at green and digital transition.

Operating the railway network efficiently, safely and accessibly means, in and of itself, contributing to a **more sustainable transport system** where trains, together with other means of collective transport, can attract growing percentages of private transport, reducing detrimental effects on the population in terms of emissions, consumption of natural resources, accidents and traffic, and meeting passenger and freight transport needs more effectively. The company is making this goal more attainable through actions aimed at driving the network's integration with other modes of transport, improving its **connectivity**, **performance** and benefit for **passenger and freight** railway companies, intermodal operators and **passengers**, placing particular emphasis on upgrading last mile connections and services and enhancing the **station**'s role as a hub of sustainable, collective, public, shared and active intermodal transport and as a centre of development for the surrounding area.

This means that, on the field and every day, RFI manages, maintains, strengthens, designs and builds lines and stations with an utmost focus on safety, impact mitigation, the rational use of resources, circularity and infrastructure control and resilience. It means that RFI has embraced an **increasingly extensive and global vision** and a growing commitment to developing the land and its assets, with the involvement of the entire organisation, the subsidiaries, suppliers and other **stakeholders**, in collaboration with institutions. RFI also relies on its established **integrated safety management system** which comprises the environmental management system, occupational health and safety management system and safe train travel and railway operation management system.

In 2021, following the measures drawn up for the economic and social post-Covid revival in Italy and Europe, RFI took on a central role in defining and implementing the **National Recovery and Resilience Plan** (NRRP) with the task of carrying out substantial investments by 2026 under Mission 3 of the NRRP "Infrastructure for sustainable mobility". These are specifically focused on strengthening accessibility and connections between regions and bridging the infrastructure gap between northern and southern Italy and with the midlands, improving the intermodality and resilience, safety, interoperability and energy efficiency of the Italian railway infrastructure.

Simultaneously, to create maximal value from the size and economic, technical, local and social scope of the investments it is tasked with making under the NRRP and beyond, RFI made a huge and speedy effort in implementing and managing the investments. In each phase, it focuses on compliance with infrastructure quality standards and the environmental sustainability of the processes along the entire value chain.With this in mind, RFI included actions in its business plan that aim to organically integrate sustainability into its modus operandi following the vision outlined by the Sustainability Committee with ten **Strategic lines of action for RFI's ESG transition**: 1) Design more sustainable infrastructure; 2) Make the railway network resilient; 3) Build and maintain a high-performance network with reduced negative impacts; 4) Make the entire supply chain sustainable; 5) Increase the efficiency and sustainability of energy consumption; 6) Develop and manage the water supply and systems in a sustainable manner; 7) Increase the quality of the passenger transport system; 8) Improve user experience at stations and integration with the local area; 9) Make use of assets no longer employed in operations; 10) Organise work in a sustainable way for our people.

Final energy consumption (*)

		2021	2020	2019
Electricity**	MWh	460,566	453,912	476,220
with guarantee of origin or self-produced solar energy	%	20%	20%	11%
Transmission of electricity for railway traction ***	MWh	420,648	388,378	468,649
Diesel	l	18,911,983	16,990,572	18,778,344
Natural gas	Sm^3	8,999,846	8,397,512	9,283,706
Other consumption	GJ	30,209	30,699	32,642
Total consumption	**GJ**	**4,157,156**	**3,934,812**	**4,392,864**

Comments on the trend

Trends in electricity consumption for internal use over the past three years mirror the phases of the public health emergency, with periods of lower demand for energy due to fewer people in work spaces and stations and the temporary shut-down of production at industrial plants in 2020.

The portion of electricity for internal use certified with guarantee of origin acquired under a specific supply contract, amounting to ∽90 GWh/year or 20% of total consumption for internal use (the remaining 80% is procured directly by RFI from the Italian Power Exchange (GME) under a contract with GSE, like for electricity for traction), confirming the company's commitment to pursuing sustainable policies aimed at reducing emissions.

Diesel consumption recorded contrasting trends over the three-year period, due to:

decreased consumption from 2019 to 2020, for train ferrying (-21%), due to lower maritime traffic during the public health emergency and the use of a more energy efficient ship, and for heating (-14%) as a result of the gradual replacement of diesel power plants with more environmentally-friendly plants along with the reduced use of work spaces and stations during the public health emergency;

increased consumption from 2020 to 2021 (-11% approximately) as a result of maritime traffic picking up again and higher numbers of road and work vehicles being used (+9%) due to restrictions on the number of occupants in line with the company's anti-Covid procedures.

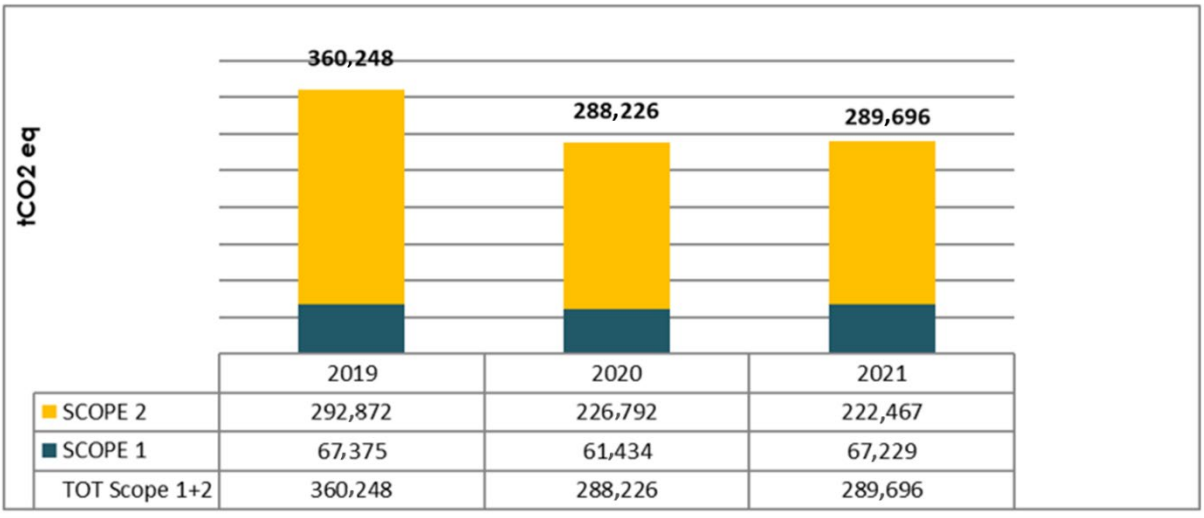
Trends in natural gas consumption were similar over the three years: the 10% decrease from 2019 to 2020 was followed by a roughly 7% increase in 2021 due to both the full return to operations, using natural gas at industrial plants, and increased heating of work spaces due to higher numbers of employees in offices.

Trends in other consumption (energy generated by district heating, LPG for heating and petrol for cars, and work vehicles and equipment), however, decreased throughout the three-year period - more acute from 2019 to 2020 (approximately -9%) - due to lower usage of energy generated by district heating for work spaces and stations.

Considering all sources of energy, there was a 5% decrease in total consumption over the three-year period. However, the trend is rising compared to the first year of the public health emergency when work spaces and stations were less populated.

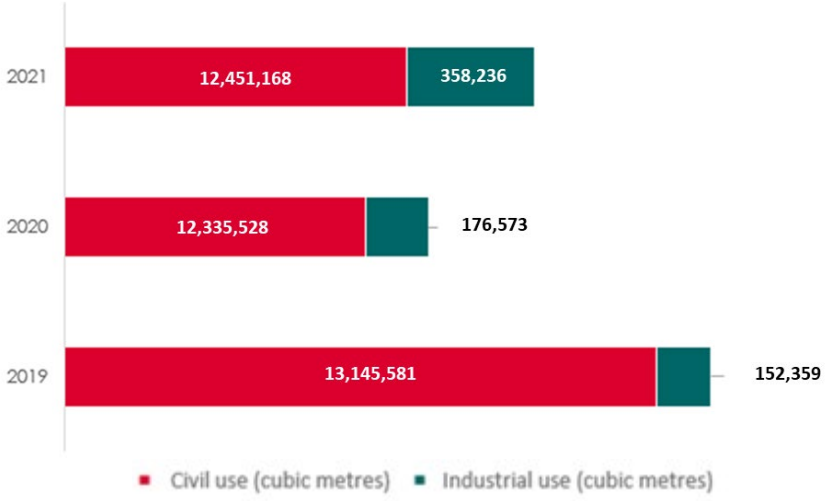
** This excludes consumption by station customers.*
*** Excluding high voltage electricity absorbed by the railway companies' trains operating on the network operated by RFI.*
**** This is energy that dissipates along the railway transport electricity grid used to power trains travelling on tracks operated by RFI. The value is estimated following the instructions of the International Union of Railways (UIC), indicated in UIC 2008 fiche 330 "Railway specific environmental performance indicators".*

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	292,872	226,792	222,467
SCOPE 1	67,375	61,434	67,229
TOT Scope 1+2	360,248	288,226	289,696

Water



Comments on the trend

Water consumption also decreased from 2019 to 2020, mainly as a result of the pandemic (especially due to fewer people in work spaces and stations) and works to optimise water supplies and systems in some regions. Then in 2021 there was a slight increase in consumption for civil use (roughly +2%) and a huge jump in consumption for industrial use (approximately +103%).

Specifically, regarding civil use, consumption of water from the mains rose in 2021 (+5%) due to higher numbers of people in work spaces and station, while consumption of underground water decreased (-2%) due to some wells being retired.

Consumption for industrial use doubled due to the higher number of trains washed as operations picked up again after the public health emergency and the acquisition of new platforms.

Waste

Comments on the trend

Volumes remained more or less unchanged from 2019 to 2020 and then increased by 14% in 2021 due to increased maintenance work carried out on infrastructure which generated higher non-hazardous waste (+15%) - especially iron and steel - and hazardous waste (+8%) - mainly wood sleepers treated with creosote oil replaced with more eco-friendly PRC (prestressed reinforced concrete) sleepers. The breakdown between non-hazardous (88%) and hazardous waste (12%) and the portion of waste sent for recovery (98% of the total, equal to roughly 292,000 tonnes) remained unchanged from 2020 to 2021.

Projects and initiatives

Scope		Description	Deadline	Average annual savings/target	Status	Notes
	NEW	**Increase the portion of electricity certified with guarantees of origin** to be consumed for internal uses other than railway traction purchased under a bilateral contract (from approximately 100 GWh to approximately 200 GWh per year).	2024	**33,000** tCO_2/year		The market-based approach is used in estimating the emissions reduction.
	NEW	**Study to develop plan for migrating to green hydrogen mobility** aimed at identifying which railway lines and areas currently using diesel trains could feasibly be transformed to hydrogen in sync with the electrification projects under way.	2026	**+clean energy**		
	NEW	**Testing the roll-out of green hydrogen transport on the Terni-L'Aquila-Sulmona line:** trial roll-out of hydrogen trains on a line of roughly 160 km currently using diesel trains, including roll-out of track-side equipment for producing, accumulating, distributing and refuelling hydrogen to fuel-cell and battery-powered trains.	2026	**7,800** teq/year		
	NEW	**Building traction substations for the recovery of energy from regenerative braking**: following the success of the trial carried out at Forlì, launching the implementation plan for 15 innovative traction substations for accumulating and reusing energy from regenerative braking and regulating voltage in order to reduce dissipation and improve the performance of the 3kVcc traction system.	2031	**225** tCO_2/year		
	UPDATED	**RESTART** (Renewable Energy to SupporT Advanced Railway Technologies): projects for energy redevelopment, energy savings and the promotion of renewable sources of energy for RFI's technological assets, with the use of low enthalpy geothermal sources.	2023	**+ clean energy**		In preparation for the roll-out of the trial phase at two pilot sites.
	UPDATED	**3 kVcc non-contact voltage detector (electrocution prevention device)**: protective device for personnel in the "traction energy" sector specifically developed by RFI as an additional preventative measure against human error.	2031	+ occupational safety		Signed a contract to engineer the device and supply 600 devices.
	UPDATED	**Integrated automatic work site protection system (SIPAC)**: innovative system that using line signalling systems to spot and warn site workers on tracks of approaching trains on the adjacent track; workers can also use the system to request a temporary halt to circulation via a mobile device with an SIL 4 security level.	2031	+ occupational safety		The first trial is expected to be completed in June 2023.

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED **Technical Academy**: boosting the efficiency and effectiveness of the technical training system by: building/revamping three training centres (Milan, Bologna and Naples); reformulating technical training programmes and processes; digitalising teaching methods and training content and implementing virtual and physical simulators.	2025	+ training + occupational safety		Design in progress
	UPDATED **Testing systems for water recovery, purification and reuse at the washing platforms** used for work vehicles and trains at the Carini and Catanzaro national workshops and at Milano Parco Centrale.	2023	13,300 m^3 of water		The executive designs have been completed.
	NEW **Infrastructure resilience: climate risk** Integrated set of analysis, monitoring and intervention actions to strengthen the resilience of infrastructure against intense and extreme weather events and hydrogeological instability with the aim of increasing the safety and preserving the continuity of railway services. Actions in progress include: - **interventions at specific infrastructure points** to mitigate hydrogeological instability defined using the priority criteria that also take into consideration IFFI (inventory of Italian landslides), PAI (plan regulating the more urgent aspects of the hydrogeological structure) and PGRA (flood risk management plan) data. - **sensors for scouring of bridge pilings**: sensors installed on various bridges to monitor the river bed when water levels rise and anticipate the scouring of pilings. - **checking hydraulic compatibility** of railway works with water crossings (bridges, small bridges, manholes). - **development of a weather/climate impact forecast platform** based on multi-sensory analyses to predict and geo-localise intense precipitation events and possible landslides caused by rainfall.	2031	+ safety		The action plan is continuously in progress and is tweaked for ongoing improvement. The sensors for scouring pilings of bridges were developed using the outcome of the pilot project Bless+. The forecast platform is the advancement of trials carried out and concluded under the RAMSES and SANSF projects in 2020.
	NEW **Infrastructure resilience: seismic risk** Integrated set of analysis, monitoring and intervention actions to reduce the seismic vulnerability of bridges and railway infrastructure. The main actions in progress include: - **specific seismic improvement works** on railway infrastructure based on checks on the seismic vulnerability of works belonging to the larger railway system - **implementation of a seismic network** to record the shake level along the line after an earthquake in order to detect which sections need to be closed and inspected - designing and building a **seismic early warning system** on the high capacity HS and traditional lines to boost efficiency in handling earthquakes and reduce the time needed to halt circulation.	2031	+ safety		The action plan is continuously in progress and is tweaked for ongoing improvement.

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED **Integrated Stations Plan - redeveloping indoor spaces and adjacent areas in a functional manner and building new stations**: organic set of actions aimed at developing the station's role as an intermodal hub and centre of development for the surrounding area, with the relevant objectives and designing and building methods focused on environmental and social sustainability. The goals include: increasing connectivity with active mobility, local public transport and shared mobility; improving internal accessibility in stations using an inclusive design without barriers; strengthening transport information and wayfinding inside and outside the station. All actions are planned and implemented in a manner that minimises the consumption of natural resources and reduces emissions over the entire life cycle of the works, taking into consideration stakeholder needs and by applying international sustainability protocols and standards such as Envision, Leed, WEL, GBC Historic Building, etc..	ongoing	**+sustainable mobility** **+ clean energy** **- CO_2** **+ integration with the local area**		The planning stage was completed to certify the projects defined for the Frosinone station, as per LEED protocol, and the new Pompeii hub, as per the Envision protocol. The pre-assessment stage was completed for applying the Envision and LEED certification protocols to the Verona, Taranto, Lecce, Milano Greco Pirelli and Benevento projects. The Integrated Stations Plan includes the individual actions for stations highlighted in last year's company highlights (Led Network of 600 stations, Green station and Relamping).
	NEW **Reuse of excavated earth and rocks.** Specific procedures were applied in the design and execution stages of railway works. Defined in RFI's civil works design manual, these aim to maximise the reuse of excavated earth and rocks in the same works or, alternatively, in other works or industrial processes in order reduce both the production of special waste and the need to procure virgin aggregates, helping the transition to a circular economy.	ongoing	**- raw materials and CO_2**		The building of the HS/HC Naples - Bari line is expected to reuse 95% excavated earth and rocks and save natural resources amounting to 47% of the total aggregates needed.
	UPDATED **Reuse of foundry sand for the superstructure**: the National Foundry Superstructure Workshop in Bari, which specialises in the production of manganese steel "frogs" (the foundation for railway exchanges), created an automated system to expand the regeneration of foundry sand used to prepare moulds up to 70%, reducing the amount of sand disposed of in order to reuse it in the production cycle, improving health and safety conditions for operators at the same time.	2024	**550 t of foundry sand** **- raw materials and CO_2**		The technical supply specifications are being fine-tuned.
	UPDATED **Ecological ballast: testing of Ecoballast®** (a sub-product derived from the slag resulting from the blast foundry of steel and carbon) **to use as stone chippings for railway ballast.**	2022	**- raw materials and CO_2**		**On-site testing was completed** at the test site set up on a section of the Portogruaro - Treviso line. Further

Scope	Description	Deadline	Average annual savings/target	Status	Notes
					preparatory checks are in progress before defining the technical specifications.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

completed

Final energy consumption (*)

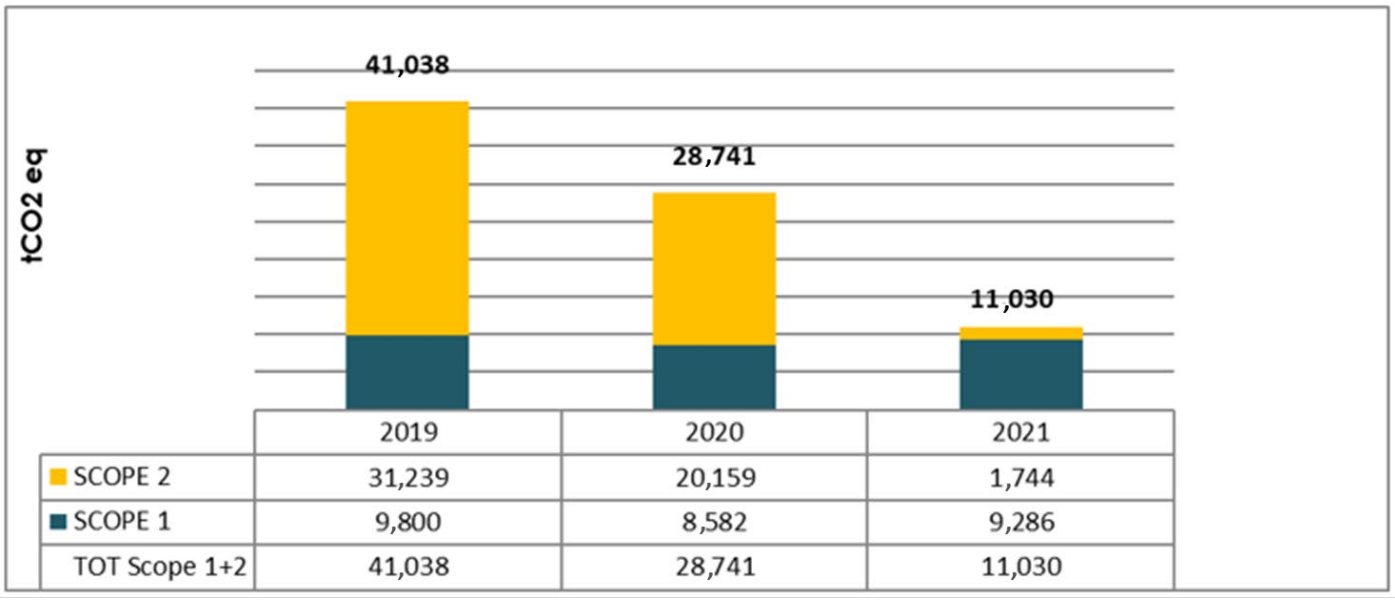
		2021	2020	2019
Electricity	MWh	60,570	54,755	64,671
with guarantee of origin or self-produced solar energy	%	98%	28%	3%
Diesel	l	192,702	190,469	212,326
Natural gas	Sm^3	4,411,913	4,044,491	4,613,326
Other consumption	GJ	19,445	16,416	16,012
Total consumption	**GJ**	**395,738**	**359,146**	**414,718**

Comments on the trend

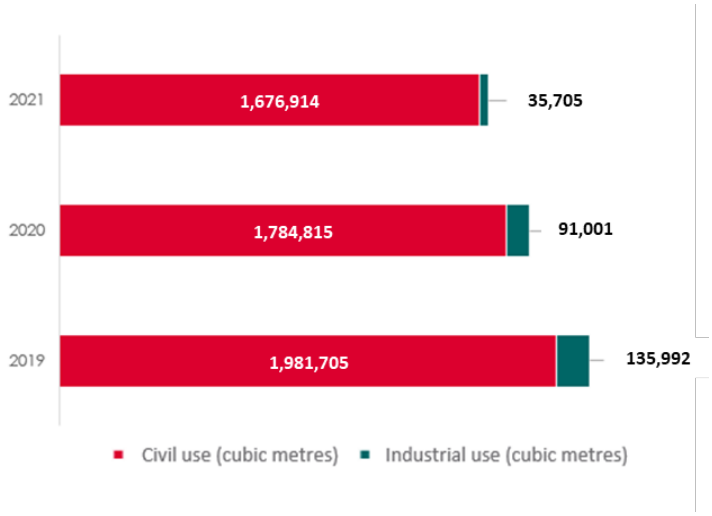
Over the 2019-2021 three-year period, the consumption of electricity for internal use* showed an overall drop of 6%, comprised of a 15% decrease in 2020 due to lower consumption of energy in offices and stations during the pandemic, and in increase of 11% in 2021 following the resurgence in operations.
The breakdown of energy sources changed over the three years: a new supply contract was rolled out on 1 August 2020 which meant almost all energy consumed (98%) came from renewable sources certified with guarantees of origin in 2021.
Diesel consumption for internal use fell by approximately 10% over the three-year period, due to the reduced consumption for heating offices in 2020 during the public health emergency, which also remained unchanged in 2021 due to employees continuing to work from home.
Trends in natural gas consumption for internal use* were similar to electricity consumption: after the decreased consumption in 2020 during the public health emergency (-12% on 2019), there was a resurgence in 2021 (+9% on 2020) once operations resumed.

** The figures refer to the environmental aspects managed directly or on behalf of the company or the group companies. They exclude consumption by station customers.*

Total CO_2eq emissions (market-based)



Water



Comments on the trend

There was a decreasing trend in water consumption for civil use over the three years (-15%) due to lower numbers of people in offices and stations during the public health emergency in 2020 and due to works carried out to make systems more efficient in 2021.

Water consumption for industrial use also dropped considerably over the three-year period (-74%) due to reduced operations at the washing platform at the Palermo Centrale station and reduced consumption of water to cool the air conditioning systems at Roma Termini in the summer.

Special waste

Comments on the trend

Over the three-year period, there was a huge drop in the portion of special waste generated, almost fully deriving from the water purification units at the Venezia S. Lucia station. The decrease from 2019 to 2020 was due to lower numbers of people in offices and stations during the public health emergency, while the decrease in 2021 was due to the adoption of a new way of managing sludge that allows its reuse.

Urban waste: customers in the station

Comments on the trend

The quantity of waste classified as urban waste produced in stations dropped significantly in 2020 (approximately 50%) compared to 2019, as a result of fewer people in stations during the pandemic.

There was a slight increase in the quantity of waste produced in 2021 due to the partial resurgence in passengers and visitors at stations, while the portion of sorted waste remained unchanged at 27%.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED **Rationalisation of the thermal power plant at Milano Centrale**: retirement/downsizing of the current thermal power plant and the steam distribution system, which will be replaced with a high-efficiency heat pump system.	2022	**500 tep** **1,300 tCO_2**		Works began in the fourth quarter of 2021 and are expected to end by the end of 2022.
	UPDATED **Construction of a photovoltaic farm** above the new car park at the Roma Termini station.	2023	**2,200 MWh** **900 tCO_2**		The technical and funding feasibility study was completed. Assessments are in progress for implementation with the station closed electricity distribution system and the preliminary design stage has been launched.
	UPDATED **Conversion of the thermal power plant** serving the Genova Principe station **from diesel to natural gas.**	2026	**50 tep** **350 tCO_2**		Work rescheduled to 2026 in order to assess reprogramming the entire air conditioning system at the station.
	NEW **Improving the efficiency of the air conditioning systems at Genova Brignole, Venezia S.L. and Venezia Mestre**.	2031	**500 tCO_2**		This project entails reprogramming the entire air conditioning systems of the relevant stations (installing heat pumps for winter air conditioning and producing domestic hot water; adjusting and rationalising current thermal power plants; readjusting the distribution line and terminals).
	NEW Performing in-depth energy surveys to identify specific works and drawing up a decarbonisation roadmap.	2026	**- CO_2**		Identifying actions and works to improve energy efficiency and to draw up a roadmap to decarbonise network sites in a bid to help reach the group's carbon neutrality vision.
	NEW Building new photovoltaic systems on the available roofs at the stations of Roma Termini, Venezia S.L., Palermo C.le, Napoli C.le, Firenze SMN and Bari C.le as set out in the new 2022-2031 business plan.	2027	**2,200 MWh** **600 tCO_2**		Installation of new photovoltaic systems which will lead to cutting electricity supply costs and a resulting large saving in CO_2 emissions.
	Maintain **ISO 14001:2015 certification** and extend it **to all network stations.**	2021	**+ prevention and control**	✓	Completed on 31 December 2021 with ISO 14001 certification of environmental management systems extended to Palermo C.le, Bari C.le and Firenze S.M.Novella, thus completing the entire Grandi Stazioni Rail network.

Increasing the portion of sorted waste produced by customers in the station.	2023	**Target 33%**		Increasing the percentage of sorted waste produced by customers in the station and collected by municipal companies at the building waste collection points, by: - installing systems incentivising sorting waste in the public areas of station; - installing mini-compactors for collecting the waste of businesses at stations; - replacing all of the bins; - involving GS Retail to share new ways of promoting environmental awareness among customers in the station.
GS Rail network car parks and intermodality - New Milan CM7 and Naples multi-storey car parks.	2022	**Intermodality**		Building new car parks at Milan CM7 (425 spaces being built) and Naples multi-storey former OCA (360 spaces being built), improving intermodality (trains – car – public transport – car and bike sharing) and developing infrastructure for charging electric cars.
GS Rail network car parks and intermodality - New Bologna Centrale car park	2031	**Intermodality**		Building a new car park at Bologna Centrale (110 spaces being built - Piazze Medaglie d'oro), improving intermodality (trains – car – public transport – car and bike sharing) and developing infrastructure for charging electric cars.
Developing soft mobility - Building new bike parks. Building new bike parks at the Rome, Genoa, Bologna, Naples and Bari stations.	2025	**Intermodality**		Building five new bike parks by 2025 for a total of approximately 800 spaces.

Key

Continuous improvement | *Raw materials cycle* | *Energy and emissions* | *Water cycle* | *Land*

in progress

completed

RFI's subsidiaries

Terminali Italia

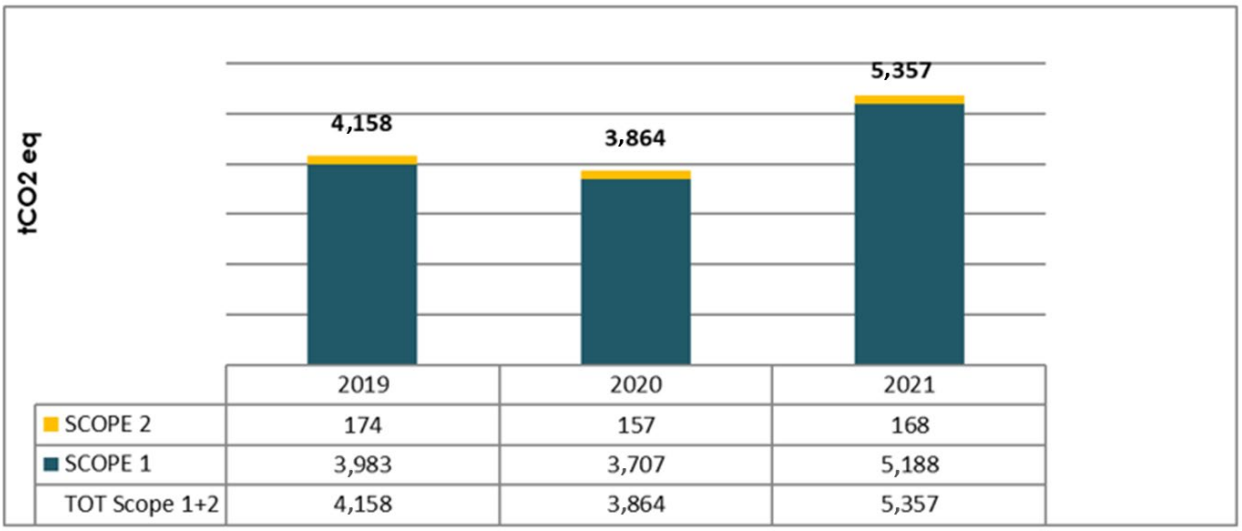
Final energy consumption

		2021	2020	2019
Electricity	MWh	2,248	2,123	2,242
with guarantee of origin	*%*	*84%*	*85%*	*84%*
Diesel	l	1,883,060	1,346,266	1,458,460
Natural gas	Sm^3	17,673	16,297	0
Total consumption	**GJ**	**76,742**	**56,842**	**60,768**

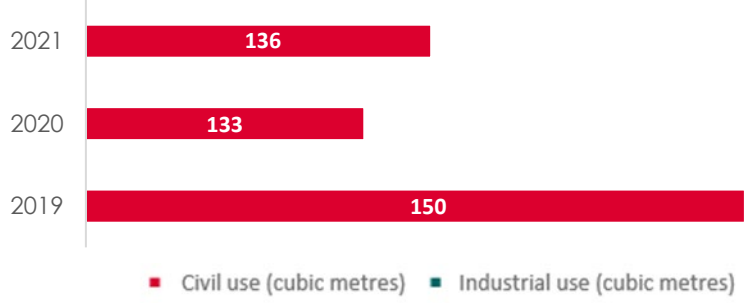
Comments on the trend

The consumption of electricity for internal use was steady over the three-year period. The percentage of energy from renewable sources certified with guarantee of origin remained constant (∽84%) from 2019 to 2021.
Diesel consumption increased by approximately 29% over the 2019-2021 period, though as a balance of two opposing trends. The 8% decrease in 2020 caused by reduced operations during the public health emergency was followed by a 40% jump in 2021 due to the roll-out of the shunting service at Marzaglia, increased shunting activities at Bari and the overall increase in crane manoeuvres.

Total CO_2eq emissions (market-based)



Water



Comments on the trend

The company's water consumption, relating entirely to the Verona terminal, remained unchanged over the past two years, down 11% on 2019, a year when checks were carried out on the pressure of the fire prevention system.

Waste

Comments on the trend

The drop in overall waste over the three-year period is the net effect of two opposing trends:

- a considerable decrease in 2020 (-54%) due to less cleaning required at yards thanks to their resurfacing;
- an increase in 2021 (+10%) due to the combined effect of increased non-hazardous special waste, especially due to the removal of liners (used for packaging materials for transportation), as well as cleaning activities at the yards of the Verona terminal, on the one hand, and reduced production of hazardous special waste as an offshoot of outsourcing the maintenance service for company operating vehicles, on the other.

The portion of waste sent for recovery swung back to 2019 levels (∽100% of the total).

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
 	**Procuring energy from suppliers that get electricity from certified renewable sources.**	30 April 2023	**827.5** tCO_2		
	**Scrapping obsolete cranes and purchasing new cranes.** Signing a master order to purchase three new cranes (and optioning a further five) to replace the obsolete cranes in the Segrate fleet.	2022			Two cranes were delivered in 2021 and one more in January 2022.
	Upgrading the crane fleet. This includes purchasing 15 mobile cranes (1 at Verona QE, 4 at Segrate, 6 at Marzaglia and 4 at Bari Ferruccio).	2031			
	Increasing the train capacity at Terminali Italia sites. This includes lengthening 11 terminal platforms to 750 m, expanding the areas for stocking the ITUs for an overall surface of approximately 233,000 m² for the entire network and purchasing seven electric gantry cranes allowing the sites to work on higher numbers of trains.	2031	**120,000** tCO_2		The annual average saving is due to reduced CO_2 emissions thanks to the road/rail modal shift.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

completed

Final energy consumption

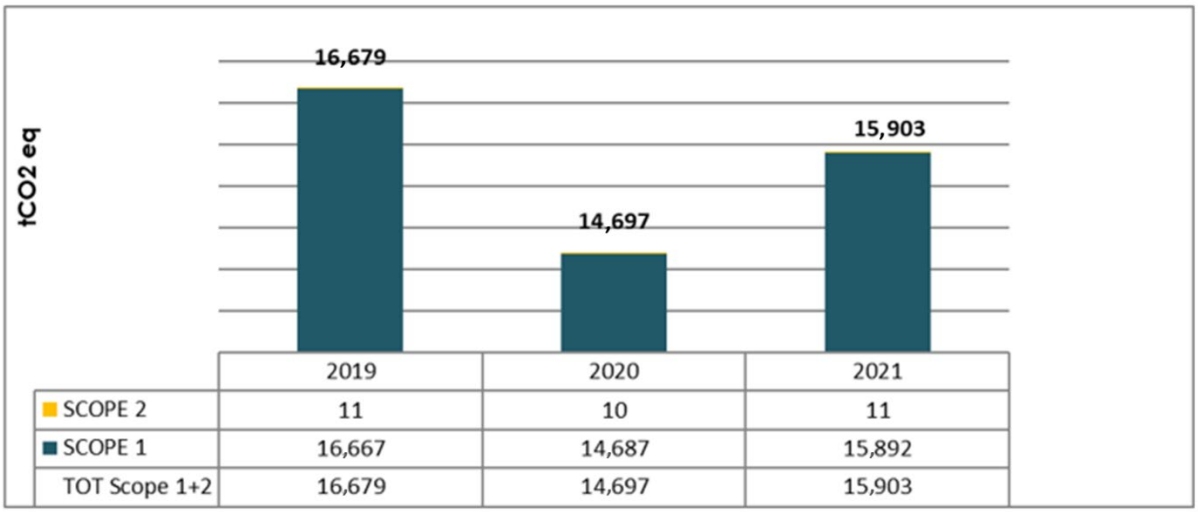
		2021	2020	2019
Diesel	l	6,788,091	6,273,743	7,120,000
Electricity for other uses	MWh	23	20	23
Total consumption	**GJ**	**212,631**	**196,514**	**223,024**

Comments on the trend

Diesel consumption decreased by approximately 5% over the 2019-2021 period, though as a balance of two opposing trends. The 12% decrease in 2020 was due to the sale of fast ships to Blue Jet[1] together with the lower number of journeys scheduled in the first half of 2020 due to the public health emergency. This was followed by a moderate increase in 2021 (approximately 8%) following the revival of operations as anti-Covid measures de-escalated and the new Sikania ship which consumes less than the rest of the fleet was placed in service in August.

The consumption of electricity for internal use, which was extremely moderate, remained more or less unchanged over the three years.

Total CO_2eq emissions (market-based)



[1] Operating since 1 May 2019

Waste

Comments on the trend

The fluctuating trends in hazardous waste produced over the three years must be interpreted in light of the outsourcing of the disposal of oil used on board ships in 2020 to the port authorities and subsequent insourcing in 2021.

Comparing 2021 figures with 2019 and looking at extraordinary maintenance of the propeller of three ships in the fleet, there is an increase in hazardous waste (mainly used oil) such to raise the overall quantity of special waste sent for recovery to around 90% of the total in 2021.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Introduction of **another new ship** with **EIAPP** (Engine International Air Pollution Prevention) certified engines.	2021	**365 t (diesel/petrol)** **300 tCO_2**	✓	The ship Sikania was placed in service in August 2021.
	Introduction of a **"zero emissions in port" ship with hybrid engines** (diesel-electric) which will replace the ship RIACE.	2025	**2,292 tCO_2**		The feasibility and design study is in progress
	Introduction of a **"zero emissions in port" ship with hybrid engines** (diesel-electric) which will replace the ship FATA MORGANA.	2028	**2,993 tCO_2**		The feasibility and design study is in progress
	 **Installation of additional** desalinators on board the new vessels in the fleet.	2022	**700 m^3 of water**		Installation on board a ship of the fleet was completed. New installations are scheduled for two ships in the fleet: Trinacria in service since February 2019 and Sikania in service since August 2021.

Key

 **Continuous improvement**

 *Raw materials cycle*

 *Energy and emissions*

 *Water cycle*

 *Land*

in progress

✓ completed

RFI's subsidiaries

Blu Jet[2]

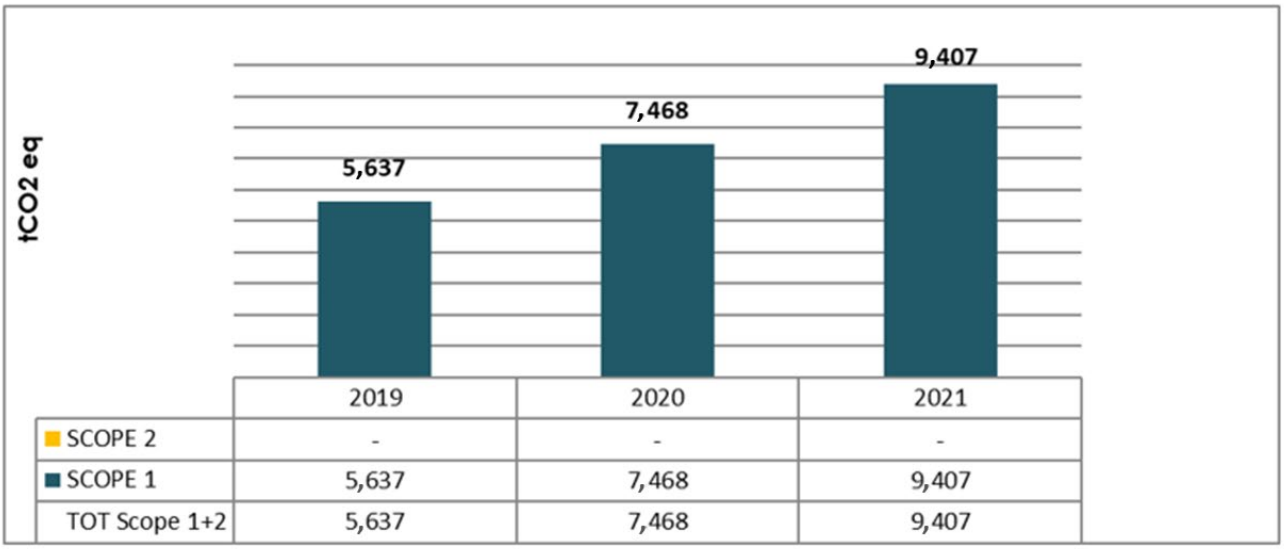
Final energy consumption

		2021	2020	2019
Diesel	l	4,017,822	3,190,143	2,408,000
Total consumption	**GJ**	**125,805**	**99,889**	**75,399**

Comments on the trend

Diesel consumption grew over the three years. Specifically, there was an increase in 2021 as the number of journeys rose compared to 2020 (+26%). The increase in 2020, on the other hand, was due to the fact that the company only began operating in May 2019. An analysis of monthly data shows a reduction in consumption in 2020 as the number of passenger journeys were reduced due to travel restrictions during the public health emergency.

CO_2eq emissions (market-based)



[2] The company, which began operating on 1 May 2019, was set up in August 2018, following the demerger of the Bluferries S.r.l. business unit.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	**Replacing the high speed fleet with bifuel hybrid ships** (LNG/diesel)	2025	**308** tCO_2		The design is in the preliminary stage

Key

 Continuous improvement

 *Raw materials cycle*

 *Energy and emissions*

 *Water cycle*

 *Land*

 in progress

 completed

OUR APPROACH

In line with the FS Italiane group's sustainability strategies, for several years, Italferr has been committed to researching methods and protocols to incorporate sustainable choices in infrastructure projects. It has refined an approach to developing infrastructure projects by enhancing the traditional project engineering method with a new outlook focused on opportunities to generate value in the reference area.

Aware of the decisive role that engineering can play in tangibly contributing to the reduction of CO_2 emissions, for several years now, Italferr has chosen the UNI ISO 14064 standard to develop and apply a specific methodology for calculating the carbon footprint of projects, certified by an independent body. This methodology has become an effective operating tool guiding designers to improve design solutions and to spur contractors, during the construction phase, to purchase more sustainable construction materials.

Another step was taken in 2021 towards the systematic use of sustainable methodologies in company processes by integrating the CO_2 rate table into STR Vision 4AS in order to provide an automated inventory of the CO_2 equivalent emissions linked to the materials, transport and processing used in the construction of infrastructural works, thus enabling a prompt assessment of the impact of works in terms of climate change. The CO_2 rate table was ISO 14064 certified by the certification body after its audit of the technical and financial feasibility project "PFTE Manoppello-Scafa, Lot 2 of the Rome-Pescara line" and the executive design "PRG Bagni di Tivoli".

As part of integrating sustainability into the design of infrastructure, implementing new models and tools aimed at boosting stakeholder engagement is particularly important. Accordingly, the company worked on structuring a stakeholder engagement process in 2021 to create a broad support network throughout the regions touched by infrastructure projects. In this regard, the company employed a sentiment analysis platform which enables social media monitoring of strategic infrastructure projects. The platform allows active listening to help gauge opinions. It processes huge quantities of data gathered from online texts (websites, social networks, blogs or forums) and provides an insight into perceptions on key issues of interest to stakeholders.
Specific sustainability studies and analyses were developed using indicators chosen based on Italferr's stakeholder engagement guidelines to enhance the benefits offered by infrastructure projects and their capacity to create value in terms of economic, environmental, social and tourist development of the regions.

Environmental planning plays a crucial role for improving the way the works interact with the local area and people. The company carries out specialised studies to check the projects' impacts on the environment and landscape and, more in general, to assess the direct and indirect effects that the construction of infrastructures could have. Furthermore, Italferr develops specific plans to identify material topics related to processing at sites, mitigation measures and monitoring to ensure proper control over the construction of works.
The focus on the environment, the essence of its sustainable approach to design, means having the contractors adopt specific UNI EN ISO 14001 environmental management in the construction of works.
Italferr requires that the companies responsible for construction companies to plan and implement, for the entire duration of the works, an environmental management system for the on-site activities that provides the company and environmental protection authorities with objective evidence of the environmental controls performed in the course of the work by the contractor's qualified personnel.
Specifically, the environmental management system requires that, prior to the start of the works, contractors carry out an initial environmental analysis of site activities in the preparation of the environmental plan for the preparation of the work site. The analysis is meant to identify the significant environmental aspects to be managed during construction and to define the operating procedures for the site's correct environmental monitoring, in accordance with the applicable regulatory requirements. Italferr constantly checks the actual implementation of environmental management systems by contractors through regular on-site monitoring.
The environmental management system is part of the integrated quality, environment,health and safety management system (ISO 9001, ISO 14001 and ISO 45001), which was successfully certified by the SGS certification body again in 2021.
ISO 14064-1:2019 certification of the company's methodology for calculating carbon footprint and the CO_2 rate table was also confirmed by the competent third-party body in 2021.

The recent European Green Deal - the manifest of the new Europe envisaged by the President of the European Commission Ursula Von der Leyen - explicitly requires an innovation strategy that is rooted in the SDGs and harnesses sustainability and innovation as the most efficient way to achieve its ambitious objectives. Italferr endorses a sustainability approach that encompasses innovation as a crucial lever to implement a new business model capable of generating value by exploiting the opportunities of digital transformation geared towards designing and building works in an increasingly integrated, efficient and automated manner.

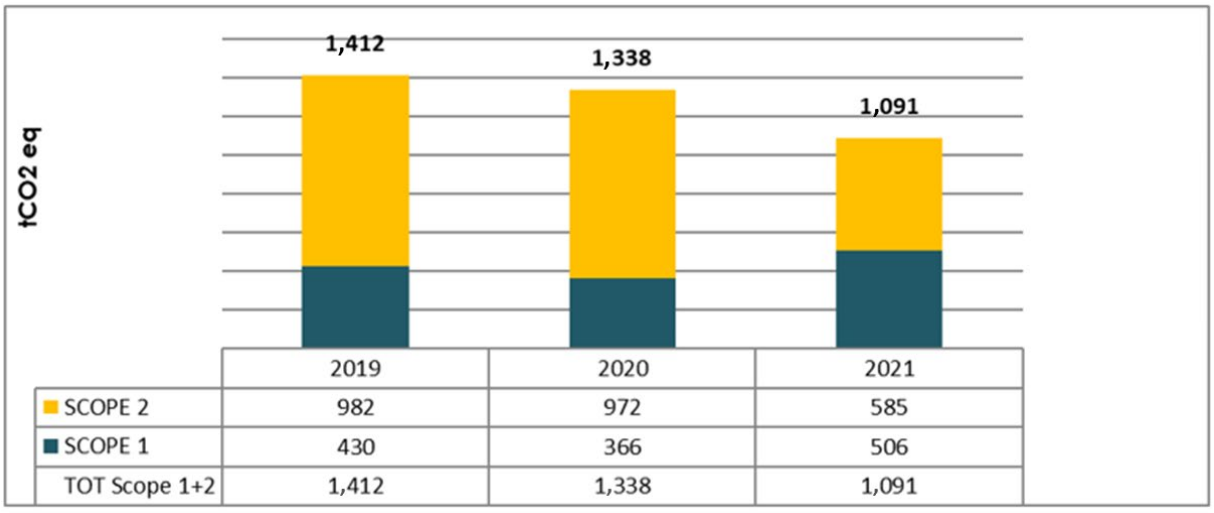
Final energy consumption

		2021	2020	2019
Electricity	MWh	2,368	2,321	2,266
with guarantee of origin or self-produced solar energy	*%*	*47%*	*14%*	*10%*
Diesel	l	164,351	116,025	142,884
Natural gas	Sm^3	22,326	20,584	23,002
Other consumption	GJ	287	192	0
Total consumption	**GJ**	**15,511**	**13,443**	**14,105**

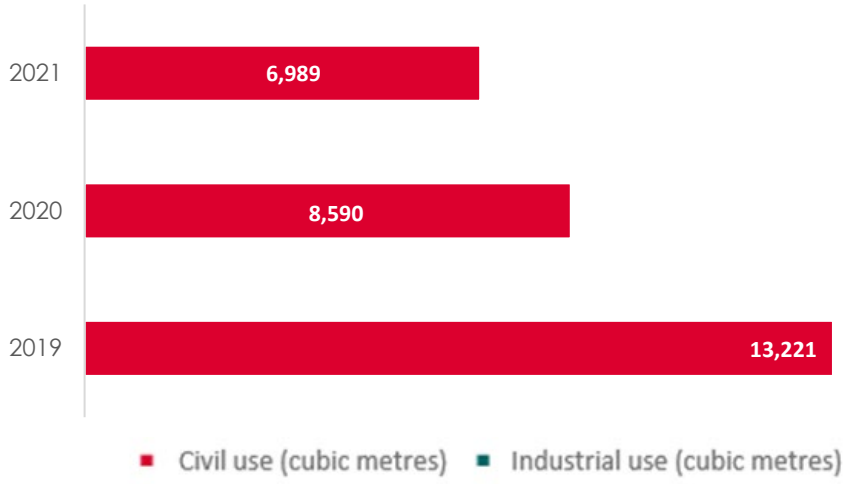
Comments on the trend

An analysis of energy consumption shows a slight rise in electricity consumption in 2021 and significant growth in diesel consumption as a result of site activities resuming and increased use of company cars.
There was also an increase in natural gas consumption in 2021 due to the partial return of employees to work spaces after 2020.
There was also a rise in the percentage of electricity from renewable sources certified with guarantee of origin in 2021.

Total CO_2eq emissions (market-based)



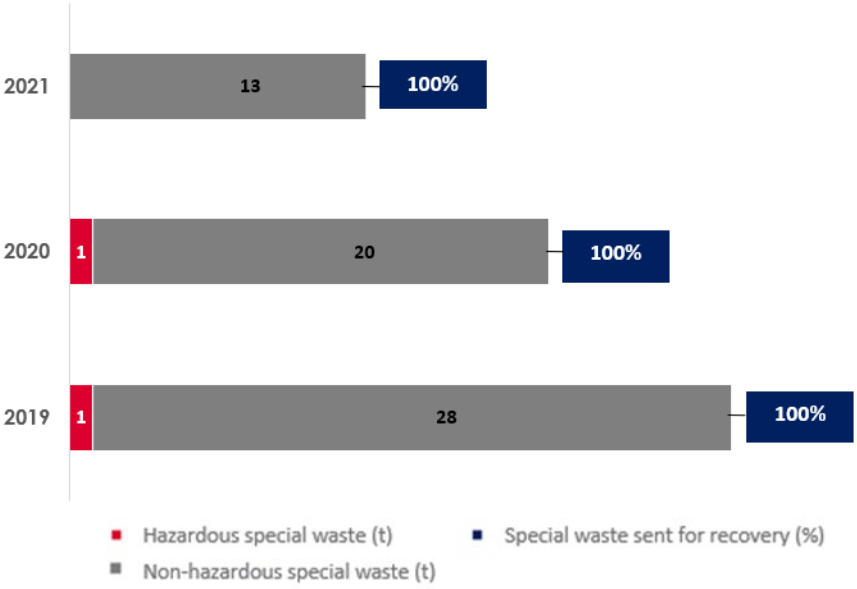
Water



Comments on the trend

Water consumption remained largely in line with the previous year as employees continued to work from home in 2021.

Waste



Comments on the trend

Figures remained essentially unchanged. The reduction in non-hazardous special waste is a result of less waste produced from transfers and optimised office spaces.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	NEW **Design of a new glass façade of the** Via Galati 71 office in Rome with opaque reflecting glass made with photovoltaic panels.	2022	- CO_2		
	UPDATED **Replacement of the refrigeration units** at the main office in Via Galati 71, Rome.	2022	- CO_2		
	UPDATED **Installation of photovoltaic panels** at the new office in S.M. Battaglia 11, Rome.	2022	- 3.6 ton/year CO_2		
	NEW **Implementation of guidelines and digital operating tools for a sustainable work site.**	*2022*	+ circular economy		A prototype of a **One-stop earth sciences desk** was developed in 2021. The system is expected to be implemented in at least three regions largely involved in the NRRP projects.
	Replacement of the plastic cups used in coffee machines **with paper cups.**	2021	- plastic	✓	
	**Sustainability analyses and study of infrastructure projects.**	2021	+ control + positive external factors	✓	In 2021, based on the "Guidelines for drafting technical and financial feasibility projects as a basis for public works contracts funded by the NRRP and the Complementary Fund", sustainability studies and reports were drafted for the works planned under the NRRP in order to provide a clear overview of the potential of the infrastructure works to generate value for the community.
	NEW **Stakeholder engagement to build solid relationships with local areas and develop opportunities for growth related to the works.**	2021	+ control + engaging the local area	✓	In 2021, Italferr developed a specific sentiment analysis platform which enables social media monitoring of strategic infrastructure projects. The platform allows active listening to help

Scope	Description	Deadline	Average annual savings/target	Status	Notes
					gauge opinions. It processes huge quantities of data gathered from online texts (websites, social networks, blogs or forums) and provides an insight into perceptions on key issues of interest to stakeholders.
	 **Measuring the carbon footprint of infrastructure projects, including using digital tools**. The methodology used to measure greenhouse gas emissions, developed in compliance with UNI ISO 14064 and certified by an independent body, is a reference method for promoting the most sustainable choices in the procurement and transport of construction materials by the construction companies.	2021	**- emissions**	✓	This methodology is an operating tool for spurring contractors, during the construction phase, to purchase construction materials from suppliers that formally declare the environmental impacts of their products using internationally recognised methods (environmental labels as per ISO 14020).
	 **Water management:** consumption of utilities is now separated at all sites assigned by RFI with specific meters for each user other than RFI.	2021	**20,000 m³**	✓	
	 Water management: setting up a summary dashboard on the SIGMAP portal for checking RFI's national water consumption.	2021	**10% total consumption RFI**	✓	The water dashboard provides overviews on data that allow the relevant parties to use and share key information. It also highlights consumption trends and swiftly detects irregularities, such as leaks or faults, thus avoiding needless costs or water wastage.

Key

 **Continuous improvement**

 *Raw materials cycle*

 *Energy and emissions*

 *Water cycle*

 *Land*

in progress

✓ completed

OUR APPROACH

In accordance with the guidelines in the sustainability governance model and the FS Italiane group's occupational health and safety guidelines and objectives and furthering its commitment to the integrated management of the requirements of major international standards, Ferservizi considers the quality of its services, the protection of the environment and the protection of occupational health and safety strategic elements in developing its business.
As part its goal of continuous improvement, Ferservizi is committed to pursuing:

- customer satisfaction by meeting agreed requirements, which it verifies through the appropriate monitoring and recording of feedback on customer satisfaction with services provided;
- the engagement, awareness and information of people through training and internal communication, to raise their awareness of the contribution that each can give;
- the definition of measurable objectives in line with company strategies, using the necessary means and resources for their pursuit;
- full compliance with the applicable legislation and, where possible, exceeding it by investing in people and protecting environmental resources;
- the involvement of the concerned parties so that they efficiently implement policies capable of spreading awareness among all workers;
- constant focus on the procurement chain, considering compliance with adequate technical and organisational requirements on occupation health and safety and their adequacy over time, in accordance with established standards and requirements, as necessary conditions for continuing the contractual relationship;
- the consolidation of a risk prevention culture to create healthy and safe work environments and promote responsible conduct, partly to pursue the group's objective of constantly reducing accidents;
- the rational and efficient use of natural resources and raw materials by reducing consumption and energy use, promoting the use of energies from renewable sources, the optimisation of the waste cycle and the prevention and reduction of pollution for the entire life cycle.

Final energy consumption

		2021	2020	2019
Electricity	MWh	2,547	2,574	3,192
with guarantee of origin or self-produced solar energy	*%*	*100%*	*100%*	*100%*
Self-produced and consumed solar energy	*MWh*	*81*	*54*	*25*
Diesel	l	100,150	124,992	138,293
Natural gas	Sm^3	244,918	217,836	330,601
Other consumption	GJ	2,331	2,307	2,502
Total consumption	**GJ**	**23,520**	**23,564**	**30,334**

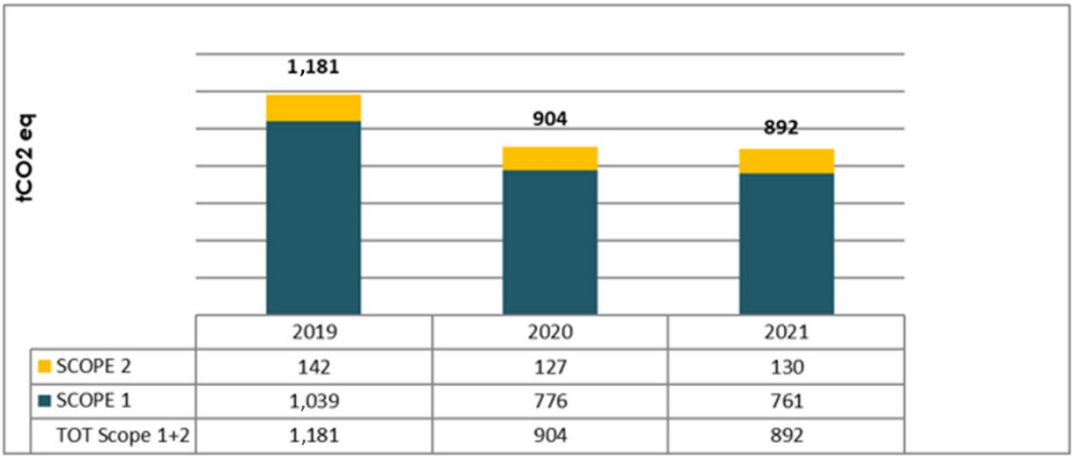
Comments on the trend

Diesel consumption fell in 2021 following the closure of the Como Ferrotel in September 2020 and malfunction and shutdown of two water heaters at the Chiusi (FI) Ferrotel.

Natural gas consumption, on the other hand, rose slightly due to employees' gradual return to work spaces, rebounding from the significant drop in 2020 during the public health emergency, and due to the Ferrotels reopening.

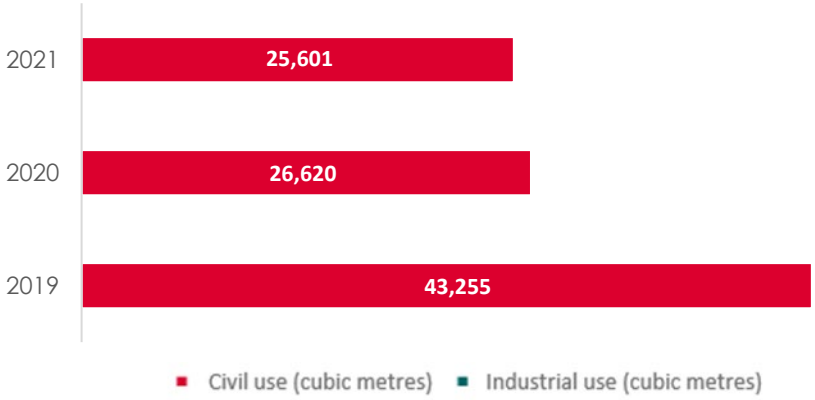
Finally, there was a constant rise in self-produced and consumed energy with the roll out of the photovoltaic systems at Naples, Bari and Reggio Calabria.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	142	127	130
SCOPE 1	1,039	776	761
TOT Scope 1+2	1,181	904	892

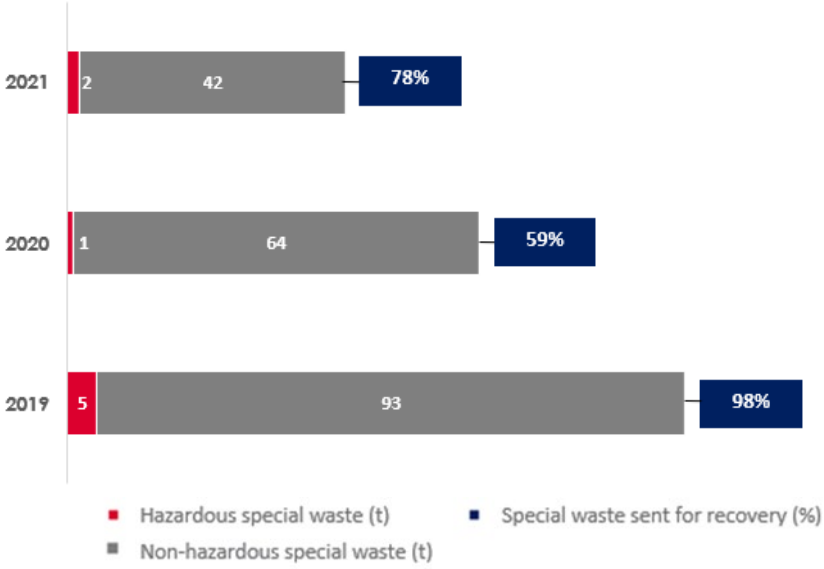
Water



Comments on the trend

Water consumption remained basically in line with 2020 when it decreased due to spaces (offices, Ferrotels and archives) being used less during lockdown as well as the closure of the Como Ferrotel.

Waste



Comments on the trend

Waste production dropped as a result of reduced porterage and handling activities due to spaces (offices, Ferrotels and archives) being used less during lockdown as well as the closure of the Como Ferrotel in 2020.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	NEW Building of a **photovoltaic system** of up to 20 kWp at the Bologna regional office.	2022	4.2 tep 8 tCO_2		When built, the plant will be connected to the electric grid of the Ferservizi meter.
	NEW Building a new **photovoltaic façade** at the Roma Tripolitania office (southern side).	2023	4.5 tep 8.6 tCO_2		The design phase has been completed. The relevant call for tenders is being prepared.
	NEW Replacement of the **thermal power plant** at the Ferrotel in Via Balbi, Genoa with a new plant with a condenser.	2022	3 tep 5.7 tCO_2		Completed design stage
	UPDATED **Building of photovoltaic systems of 6-20 kWp** at the local Venezia Mestre, Rome and Foligno sites for a total of 55 kWp	2021	12 tep approx. 22.9 tCO_2	✓	The photovoltaic systems in Rome (4.20 tep), Foligno (3.6 tep) and Mestre (4.20 tep) were completed in 2021 though not yet connected to the grid.
	NEW **Smart Building:** intelligent management of energy consumption using a centralised monitoring system.	2022	+ quality		Identifying technologies for centralised monitoring and control of consumption at Ferservizi sites.
	UPDATED **Conducting supplier audits.**	Ongoing	+ culture		The company intends to perform these audits annually.
	UPDATED **Activities to maintain** ISO 9001, ISO 45001 and ISO 14001 certification of the integrated system in 2022.	Ongoing	+ culture		

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	NEW **Employee engagement actions**: training/information sessions to update on legislation and spread awareness of quality, safety and environmental issues.	2022	+ culture		Creating specific information sessions on the company intranet.
	NEW **HR paperless:** full elimination of paper forms for employees.	2022	- paper		Reducing paper consumption by digitalising processes.
	NEW **Implementation of plant engineering works** for the office buildings to ensure greater safety in the workplace in **mitigating the risk of Covid-19 infection** (e.g., photo-catalytic fan coils, photo-catalytic filters for existing fan coils, fresh air ventilation).	2022	+ safety		In the study phase.
	NEW Information platform. Information on safety and environmental documents and contact people.	2022	+digitalisation		In the design phase.
	NEW Identification of **post-industrial areas and land to be used for planting**	2022	+ regeneration of the land		In the study phase.

Key

Continuous improvement | *Raw materials cycle* | *Energy and emissions* | *Water cycle* | *Land*

in progress

completed

OUR APPROACH

FSE operates as both infrastructure operator and railway company. It manages 474 km of railway lines in the four southern provinces of Puglia (Bari, Taranto, Brindisi and Lecce), offering a widespread integrated rail and road service in over 130 municipalities in the region of Puglia.

In line with the FS Italiane group's strategic guidelines, FSE believes that the quality and sustainability of its services are essential to its business. It is committed to improving its quality management and worker health and safety systems and certifying its environmental management system to establish the integrated management of business processes in accordance with the requirements of major international standards, as well as investing in technologies to reduce greenhouse gas emissions and fossil fuel consumption, also promoting the use of renewable sources.

Final energy consumption

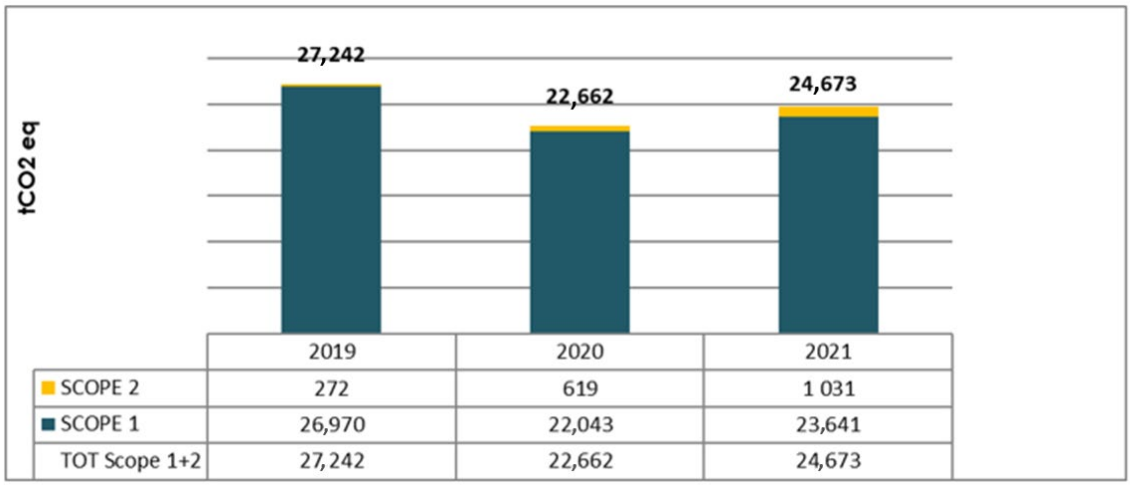
		2021	2020	2019
Electricity for railway traction	MWh	2,195	1,271	566
Electricity for other uses	MWh	3,953	4,035	4,416
with guarantee of origin or self-produced solar energy	*%*	*100%*	*100%*	*100%*
Diesel	l	8,546,151	7,957,754	9,722,983
Natural gas	Sm^3	35,117	37,144	42,015
Other consumption	GJ	0	188	104
Total consumption	**GJ**	**332,246**	**308,210**	**370,967**

Comments on the trend

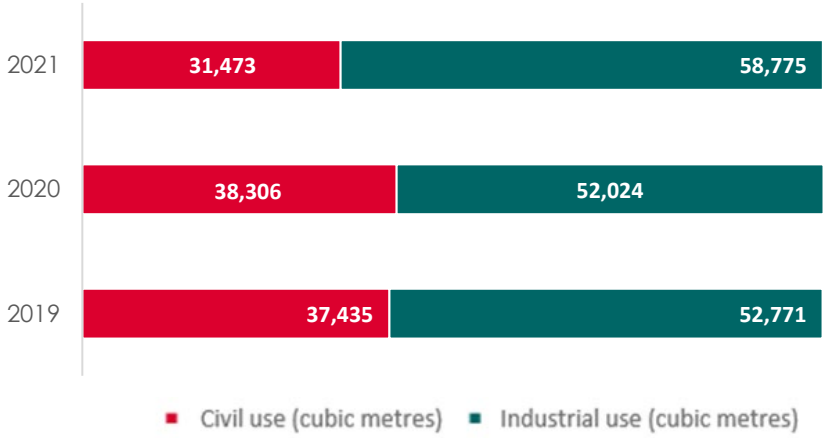
The consumption of electricity for railway traction increased in 2021 due to the gradual rise in railway production using electric trains on the previous year.

Diesel consumption rose due to increased bus services compared to 2020 along with the conversion of company cars previously running on other fuels (petrol and LPG).

Total CO_2eq emissions (market-based)



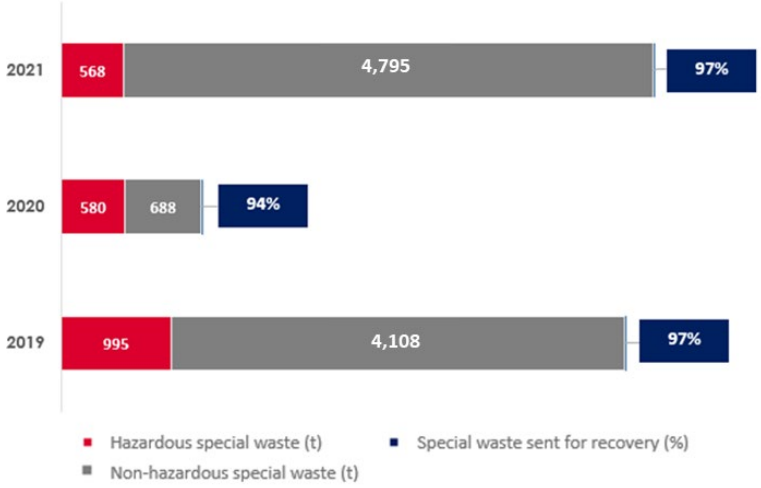
Water



Comments on the trend

Water consumption remained unchanged overall, with a slight shift from consumption for civil use towards consumption for industrial use, partly due to intensified vehicle disinfection.

Waste



Comments on the trend

After dropping off in 2020, work on upgrading FSE's railway infrastructure began again in 2021. This included the end-of-life management of superstructure material, the main source of special waste.

Special waste generation is reaching circularity, with a recovery rate of 97%.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	NEW **Reactivation of the electrification of the Bari - Taranto line**	2023	+ electrification		Reactivating the electrification of the Bari - Putignano (via Casamassima) - Martina Franca - Taranto line (146 km) following damage and theft.
	UPDATED **Electrification of the following railway lines:** Martina Franca - Lecce, Maglie - Otranto, Zollino - Gagliano and the Lecce - Zollino section.	2026	+ electrification		The overall project provides for the electrification of a 186 km line from Martina Franca to Gagliano del Capo. The goal is to raise the environmental standards and reduce CO_2 emissions. **The preliminary work was completed in 2021**, involving the section between Lecce, San Cesario, San Donato, Galugnano, Sternatia and Zollino.
	UPDATED **Upgrading of the train fleet with electric ETRs** for the electric lines.	2026	- 3.66 million litres of diesel - 7,711 tCO_2/year		In September 2019, **the first five ETRs were placed in service on the Bari-Putignano line followed by a further six ETRs between 2020 and 2021**. Another 25 ETRs will be purchased and delivered in 2022-2026 to be used over the entire electrified network.
	NEW **Purchase of hydrogen trains** using NRRP funds.	2026	- 0.73 million litres of diesel - 3,138 tCO_2/year		Purchase of nine hydrogen trains for the non-electrified lines in Salento.

	UPDATED **Upgrading of the bus fleet.**	2026	- 318 tCO_2/year		270 new Euro 6 buses will be purchased to continue the technological upgrade of the fleet and reduce emissions of greenhouse gases and particulates. **The goal is to have an entire fleet of Euro 6 buses by 2026.**
	NEW **Purchase of hydrogen buses** using NRRP funds.	2025	- 1,297 tCO_2/year		27 hydrogen buses will be purchased as part of the ecological upgrading of the fleet.
	NEW **Increasing supply of electricity from renewable sources certified with guarantee of origin.**	2030	- CO_2		The portion of electricity for railway traction from renewable sources was increased. **100% of electricity for uses other than railway traction comes from renewable sources.**
	UPDATED **Upgrading the railway superstructure on the Bari - Taranto line**, replacing wood sleepers with reinforced concrete sleepers.	2023	+ safety		The project aims to raise the performance of railway superstructure (tracks, switches, sleepers and ballast) on the Bari-Taranto line, simultaneously removing speed restrictions due to the many spots of deterioration. The work will be an infrastructure upgrading aimed at bringing the line up to RFI standards and in line with the technical specifications of interoperability.
	UPDATED Continue with the **certification of the ISO 14001 environmental management system.**	2022	+ **culture**		

Key

Continuous improvement | *Raw materials cycle* | *Energy and emissions* | *Water cycle* | *Land*

in progress

completed

OUR APPROACH

Anas S.p.A. considers sustainable development a crucial aspect when taking decisions about how to operate the roadway and motorway network. It believes in protecting the land and landscape and striving for innovation in new methodologies for the designing, processing, recovery of materials and, in general, protecting the environment.
To develop sustainably, Anas carefully assesses all impacts and promotes the adoption of criteria, guidelines and procedures to reduce the environmental impact of its activities by: upholding the principles of environmentalism and the responsible use of resources in the planning stages, with the design of projects that integrate environmental protection and enhancement; when setting up new work sites, controlling and monitoring the environmental impacts of its work sites and optimising the consumption of raw materials and natural resources; in operations, reducing and optimising energy consumption; adopting the most advanced solutions to reduce noise pollution by installing noise-dampening barriers and using noise-dampening asphalt, in compliance with the national noise containment and mitigation plan.
By continuously improving its environmental performance, Anas recognises that it achieves significant advantages, minimising all the adverse environmental impacts of its activities wherever feasible and economically sustainable.

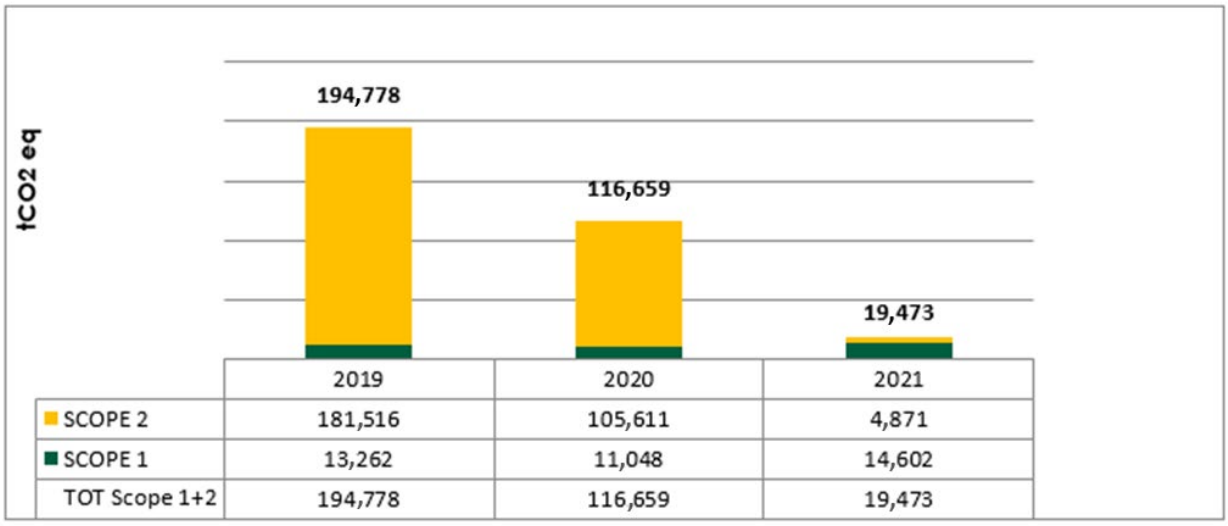
Final energy consumption

		2021	2020	2019
Electricity to light roads and tunnels	MWh	345,699	351,631	366,666
with guarantee of origin		*97%*	*40%*	*0%*
Electricity for other uses	MWh	12,677	12,180	11,627
with guarantee of origin or self-produced solar energy	*%*	*100%*	*44%*	*1%*
Self-produced and consumed solar energy	*MWh*	*47*	*101*	*134*
Diesel	l	4,591,817	3,643,474	4,512,455
Natural gas	Sm^3	501,084	504,277	450,658
Other consumption	GJ	17,456	3,731	3,595
Total consumption	**GJ**	**1,490,587**	**1,462,303**	**1,543,838**

Comments on the trend

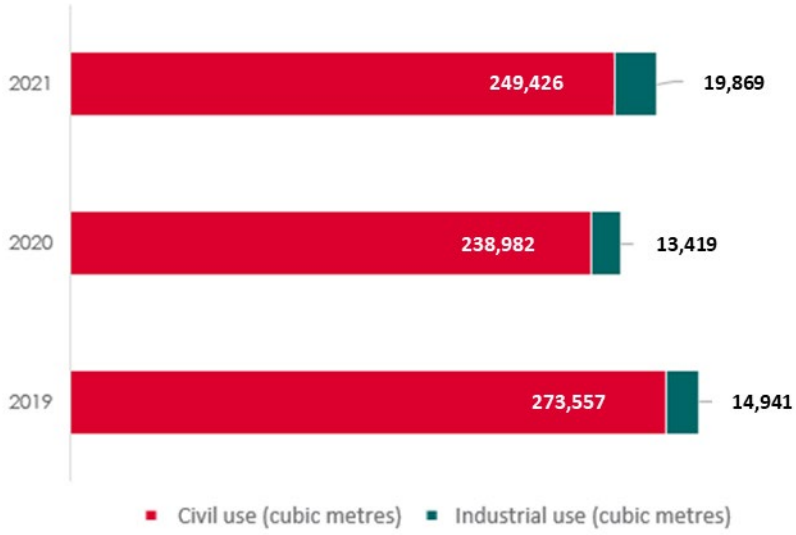
Diesel consumption increased by roughly 27% as electricity generators were put back into operation in various tunnels and company cars were used more, due to both more routes running and more cars needed following pandemic-related restrictions introduced on the number of occupants. There was an increase in other consumption, including petrol which is used in the new cars purchased in 2021. Electricity and natural gas consumption was more or less in line with the previous year. There was a higher percentage of electricity from renewable sources certified with guarantee of origin, reaching roughly 97% of the total. Indeed, Anas has been purchasing green energy under the Consip agreement since August 2021.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	181,516	105,611	4,871
SCOPE 1	13,262	11,048	14,602
TOT Scope 1+2	194,778	116,659	19,473

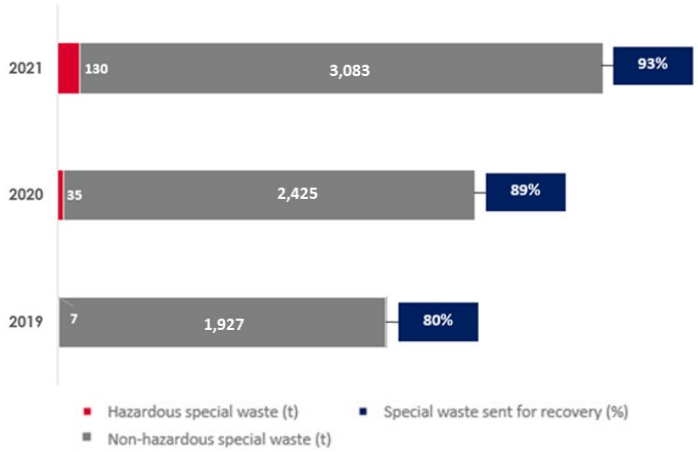
Water



Comments on the trend

With operations picking up again and employees returning to the workplace following improvements in the pandemic situation, water withdrawn for civil use increased compared to 2020. Similarly, water consumption for industrial use also rose with vehicle washing units returning to full operations.

Waste



Comments on the trend

The rise in hazardous and non-hazardous special waste is due to increased non-routine cleaning of road appurtenances. Waste sent for recovery is largely in line with previous years

Projects and initiatives

Scope	Description	Deadline	Average annual savings/targets	Status	Notes
	**The oil and refreshment service concessions were renewed** at the 10 service areas along the A90 and A91 motorways, which led the concession operators to install: • **10 photovoltaic systems at service stations** with capacity of 19.950 kW; • **10 solar thermal plants** to heat water for the workers' toilets; • **LED light bulbs** for the refuelling area, the parking area, the shelter and the shop-cafe; • **air conditioning system** for all rooms in the buildings, **powered by high-efficiency, low-energy absorption heat pumps.**	2028	- CO_2 + **clean energy** + ***customer satisfaction***		Actions to reduce energy consumption will encompass upgrading works on the areas as a whole scheduled to begin in 2022-2024 and subject to the completion of the design activities by the contractors and the subsequent issue of the authorisations by the relevant authorities. Pending the imminent completion of the design/authorisation process, upon Anas' invitation, certain operators have already launched some activities to ensure energy savings such as installing LED lighting and replacing air-conditioning systems.
	Project to improve the energy efficiency of Anas offices: • **Insulating** walls, floors and roofs; • **Installing solar panels;** • **Relighting;** • **Implementing smart systems;** • **Replacing systems and devices** with energy-saving technology for heating, water heating, air conditioning and mechanical ventilation; • **Replacing windows and frames.**	2024	**17,054 MWh** **4,734** tCO_2		
	**Green light project: maintenance of tunnel lighting systems** by replacing obsolete lighting devices **with latest-generation LEDs.**	2022	**15,000 MWh** **4,164** tCO_2		
	Purchasing green energy for the company's entire energy consumption, which is equal to 380 GWh per year, for lighting roads and tunnels and for other uses.	2021	**over 100,000** tCO_2		
	**Studies for the recycling of polymer materials** through the use of rubber powder from tyres no longer in use, to produce low-noise, durable floors and **light plastics** derived from waste bales to produce asphalt mixtures.	2026	- **raw materials and noise** **3-6 dB**		The testing was a success and the specifications of the top layers (also following the issue of Decree no. 78/2020 of the Ministry of the Environment) have already been included in the framework agreement for

					performing works to dampen noise throughout Italy (DG163/20). The tender - already awarded - is broken down into four lots: lot 1 North for €18 million; lot 2 Centre for €33 million; lot 3 South for €31 million; and lot 4 Islands for €18 million.
	Project to recycle recovered asphalt concrete (milled): to produce new concrete, Anas is working on how to **best classify the reuse of milled concrete in accordance with the ruling regulatory/legislative framework in order to incentivise large-scale use.**	2026	**- raw materials**		**Target: minimise consumption of raw materials and reduce materials sent to landfill**
	"ANAS" (Anti-Noise Acoustic Screen): standardisation and customisation of anti-noise acoustic screens by adapting objects capable of blocking noise in situations of ordinary levels of criticality (distance of receivers from the screen; size of the buildings matching the height of the screen) to comply with environmental and landscape restrictions.	2021	**- noise** **+ *customer satisfaction***	✓	**Target**: improve the environmental performance: intrinsic acoustic features, visual impact and impact on the landscape.
UPDATED	**Plastic Free**: project to install 48 water dispensers at all General Department offices, and 11 distribution points at the Regional Office in Puglia, and provide personnel with around 1.600 insulated water bottles is under development.	2024	- plastic		
NEW	**IASNAF - Innovative asphalts with natural fibres** - The project will develop and test new formulas of asphalt concrete with functionalised cellulose fibres in order to improve the mechanical and acoustic performance of road surfacing.	2023	**- 3-5 dB**		**Target:** increase the durability and acoustic performance of anti-noise road surfacing by using natural fibres suitably functionalised to strength the bond between bitumen and stone aggregates.
NEW	**ECOROADS - Innovative barriers for mitigation of noise and Chemical pollution from ROADS -** The projects will test the effectiveness of techniques to mitigate noise and air pollution by introducing into controlled environments trees inoculated with hydrocarbon degrading bacteria that can help remove the main components of air particulates by absorbing them through the surface of leaves and mineralising contaminants via bacterial biodegradation.	2023	**- 6 dB** **- 42-270 kg PM10/hectare/year**		**Target:** reduce emissions of gas substances produced by traffic using natural solutions and dampening noise at receivers located near infrastructures.
NEW	**DYNAMAP + _DYNamic Acoustic MAPping** Implementation of the dynamic mapping system in real situations (business case) - Expanding the Dynamap system to significant sections of the Anas network.	2024	**+ Innovation TRL 9**		**Target:** the new project will upgrade the system to also monitor air quality and weather conditions. It will also carry out a study to map railway sources and the procedures needed to launch the new

The project plans to complete the monitoring system already installed along the A90 motorway and implement it in areas chosen for real time monitoring of the acoustic impact, e.g., the Catania and Bari connectors.				ANAS system for the design and building of real time mapping systems.
NEW **"PRESERVING THE ENVIRONMENT" COLLABORATION GROUP -** This initiative originates from the Infra4Dfuture European project, under which eight Collaboration Groups were set up to create the synergies needed to foster common interest research focused on specific issues.	2028	+ culture		**Target:** setting up an international research platform would help: drastically reduce research costs for individual projects; boost the number of projects under the same budget; forge a strong partnership to be eligible for funds from external financing; share experiences and solutions to attain comparable results.
NEW **ECODRIVE - ECO-driving to reduce vehicular emissions -** The project aims to create a platform to automatically control and manage traffic using the information provided by a network of low-cost sensors (traffic, weather, acoustic and air quality). The platform will use AI algorithms to control and manage vehicular traffic. Scope: mitigate polluting emissions in areas featuring road infrastructure in real time when strictly necessary.	2025	- 4 dB - 20% pollution		**Target:** reduce the usage of infrastructural interventions (noise-dampening barriers and road surfacing); only intervene when strictly necessary (dynamic mitigation system); improve air quality and reduce impacts at receivers.
NEW **SILENT - Sustainable innovations for long-life environmental noise technologies** - The project aims to develop long-term sustainable innovative solutions to mitigate the noise produced by road and rail traffic. Specifically, the project's objectives are to build: • anti-noise road surfacing with recycled and non-toxic materials sourced from the paper and used tyres segments, to improve resistance to fatigue; • low noise-dampening barriers to dampen noise from railway traffic, also using recycled materials.	2027	- 3-5 dB		**Target**: increase the durability and acoustic performance of anti-noise road surfacing; develop technology that can dampen railway noise directly at the source; prepare procedures to synchronise and manage action plans in areas with noise from both roads and railways using the technologies developed.
NEW **PIARC TC 3.4: Environmental sustainability in road infrastructure and transport systems - Noise mitigation.** The project will research emerging innovations in mitigating noise from road infrastructure and assess the potential of their practical application within a time horizon of a few years.	2023	+ culture		**Target:** provide a profile of the status of noise mitigation actions, the relevant technical regulations and applicable models for an assessment of the sustainability of the various solutions

	The assessment will take two different factors into account: • possibilities of swift transition from the research and development phase to widespread implementation in real situations (strengths and weaknesses), referring to scientific literature, research projects funded by the European Union, the CEDR, etc.; • the technical, environmental, social and economic sustainability of each solution.				analysed. Apply the identified models to some study cases.
	NEW **UNI 11160 - Guidelines for the design, building and testing of anti-noise systems for land transport infrastructure -** Review and update of the UNI 11160 standard on the design, building and testing of noise-dampening barriers. The standard aims to review all prescriptions, taking on board legislative updates and new preventative testing assessment techniques for acoustic performance.	2023	+ culture		**Target:** update the standard providing guidelines for the design, building, testing and removal of anti-noise systems for land transport in compliance with current regulatory and legislative references for the entire life cycle of the infrastructure.
	NEW **ADVANCED CPX MEASUREMENT SYSTEM -** The project aims to design and build a new mobile laboratory, dedicated to assessing the acoustic performance of road surfacing, that can provide real-time results of the measures taken. The system will use innovative technologies and tools that can overcome the limitations of traditional systems, such as eliminating background vehicle noise and inconvenient reflections which currently invalidate the reliability of the results.	2024	+ innovation TRL 9		**Target:** overcome current limitations to measuring techniques used by the CPX system by using advanced calculation systems and quiet vehicles.
	NEW **Runoff water –** Analysing and handling road runoff water - The project will: draw up guidelines for designing and managing systems for treating surface water in line with legislative provisions and calibrated to ANAS's needs; define the performance/regulatory and technological/building (technical log) characteristics of the various elements of the surface water treatment system; investigate implementing ameliorative/innovative solutions which ensure greater efficiency/effectiveness than those currently adopted and are easier to manage.	2023	+ culture		**Target**: further investigate runoff water treatment systems to best design new systems, in relation to the actual water filtering requirements; cut installation and maintenance costs for runoff water treatment systems; identify new solutions with a lower environmental impact (nature based solutions).

Key

Continuous improvement | *Raw materials cycle* | *Energy and emissions* | *Water cycle* | *Land*

in progress

completed

OUR APPROACH

The **sustainability policy** adopted by the sub-holding Busitalia (Busitalia - Sita Nord and its subsidiaries) in January 2021 sets out the principles to be pursued to manage impacts responsibly in line with FS Italiane group strategies in a management system covering all operating sites.

Busitalia's **sustainable activities** are broken down into seven commitments including passenger safety, contributing to more inclusive, resilient and sustainable cities, improving air quality and environmental performance, developing quality infrastructure, listening to the local community and enhancing employees.

Specifically, Busitalia channels its commitment into **fighting climate change**, upgrading to a more environmentally-friendly fleet, promoting **efficient use** of energy resources and **sustainable management** of water resources, carrying out energy saving upgrades and procuring energy from renewable sources.

This report is a way of communicating with the communities served by Busitalia, as an integral part of the strategy developed by the FS Italiane group.

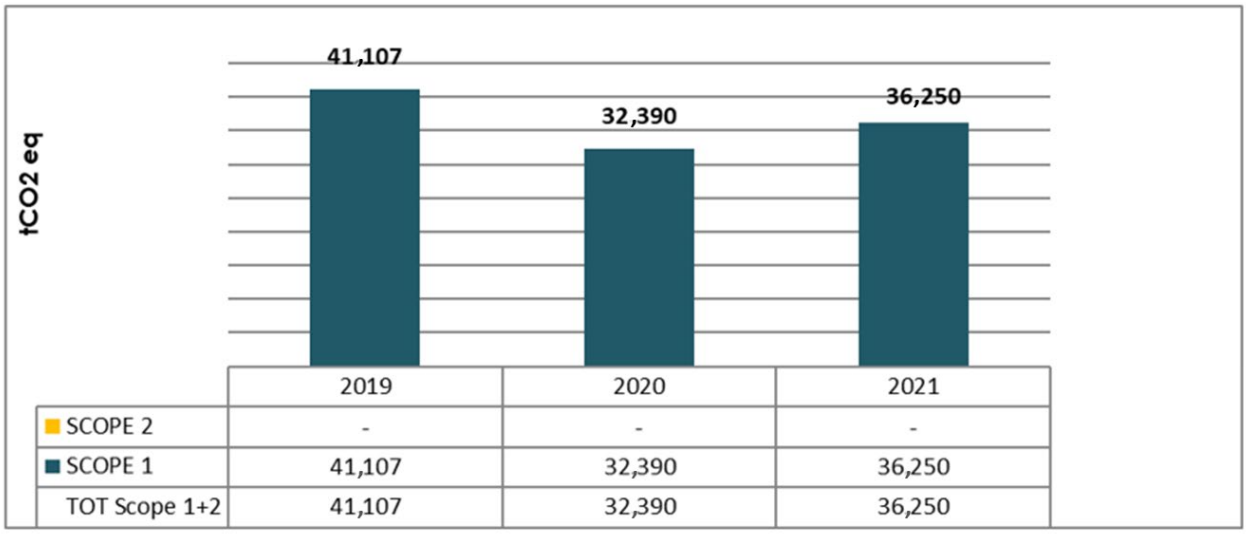
Final energy consumption

		2021	2020	2019
Electricity	MWh	4,514	4,490	4,513
with guarantee of origin	*%*	*100%*	*100%*	*100%*
Diesel	l	11,923,364	10,712,244	13,390,732
Natural gas	Sm^3	1,946,453	1,671,367	2,382,410
Other consumption	GJ	22	16	34
Total consumption	**GJ**	**513,172**	**459,996**	**581,171**

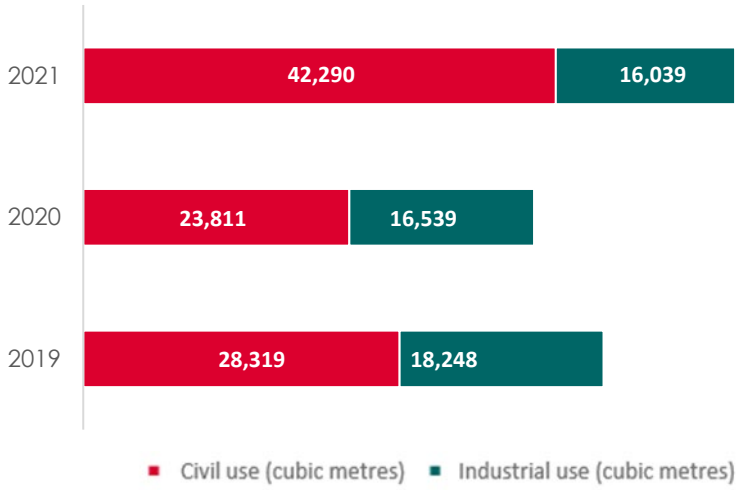
Comments on the trend

Electricity consumption remained essentially unchanged in 2021 compared to the previous year.
There was a slight increase in diesel and natural gas consumption in 2021, due to the partial recommencement of services which had been reduced in 2020 as a result of restrictions imposed during the public health emergency.

Total CO_2eq emissions (market-based)



Water

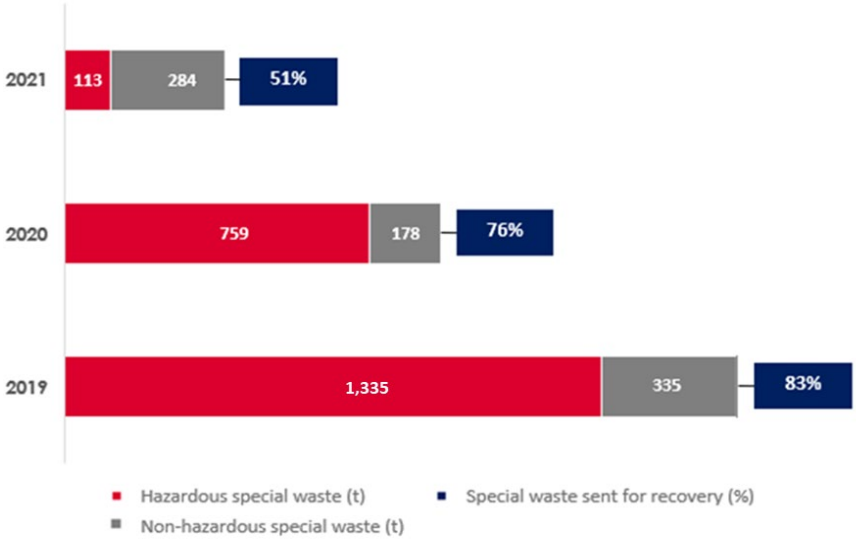


Comments on the trend

The higher consumption of water for civil use is due to a leak at the Florence site estimated at 27,000 m³. Consumption of water for industrial use was in line with the previous year.

Consumption of water for civil use and for industrial use at the Umbria Regional Division was unchanged from the previous year.

Waste



Comments on the trend

The sharp drop in hazardous special waste is due to the completion of the plan rolled out in the previous year to upgrade vehicles at the Tuscany Regional Division, leading to a large dip in vehicles scrapped (and hazardous special waste). The rise in non-hazardous special waste, on the other hand, is due to employees returning to offices, though not reaching pre-pandemic levels.

There was a huge drop in hazardous waste sent for both recovery and disposal at the Umbria Regional Division in 2021. The former decreased due to no buses being scrapped in 2021, while the latter decreased on 2020 as it was no longer necessary to clean the deoilers of the water purification units.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED Compared to the work planned, **nine diesel buses with Euro 6 engines were added to the vehicle fleet in 2021** to replace old-generation Euro 3 and Euro 5 vehicles that ran on petrol and natural gas.	2021	**133** tCO_2	✓	Overall, 51 vehicles were to be added in 2021 as well as two more later. As only nine vehicles were added, the remaining 44 vehicles have been rescheduled for 2022.
	NEW **Another 120 old-generation Euro 6 petrol buses** will be replaced in 2022	2022	**2,821** tCO_2		**The project includes replacing 35 urban EEV buses that run on natural gas** with 35 new Euro 6 diesel buses, previously scheduled for 2021. In addition, 85 new Euro 6 diesel buses will be placed in service (nine of which previously scheduled for 2021) to replace 85 old-generation buses (17 urban and 29 suburban Euro 2 buses, 9 urban and 14 suburban Euro 3 buses, 14 urban and 2 suburban Euro 4 buses, all fuelled by diesel).
	UPDATED **Energy efficiency project** on the Busitalia group fleet to improve the driving performance of drivers using an **innovative remote monitoring system**.	Currently being updated.			**The company is assessing various options on how to continue the project.**

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

✓ completed

Busitalia - Sita Nord's subsidiaries

Busitalia Veneto

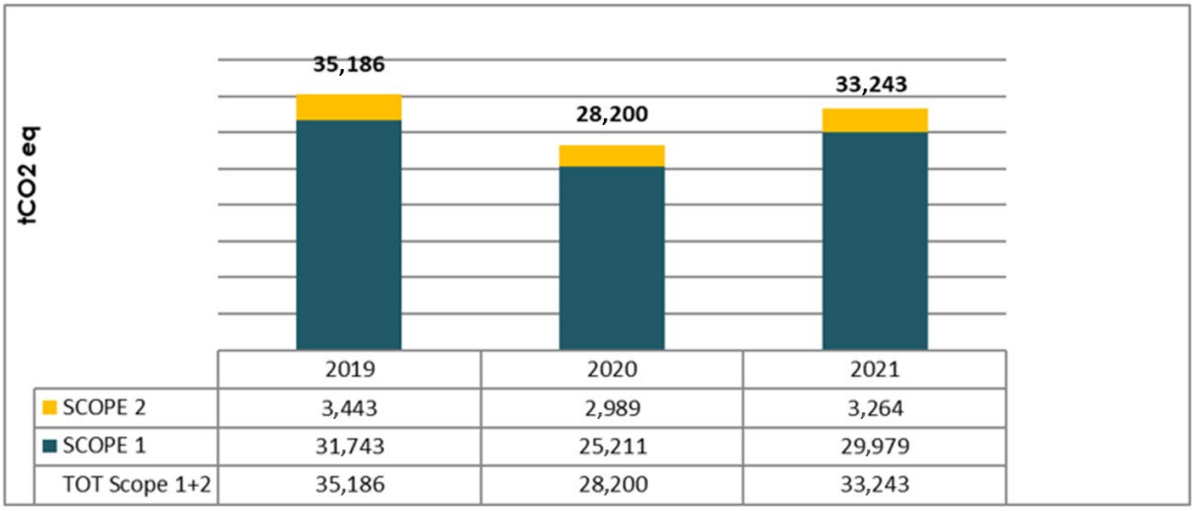
Final energy consumption

		2021	2020	2019
Electricity	MWh	6,950	6,135	7,174
with guarantee of origin or self-produced solar energy	*%*	*0%*	*0%*	*0%*
Diesel	l	8,645,803	7,510,340	9,386,584
Natural gas	Sm^3	3,394,253	2,523,875	3,268,867
Other consumption	GJ	89	426	64
Total consumption	**GJ**	**453,651**	**380,245**	**476,901**

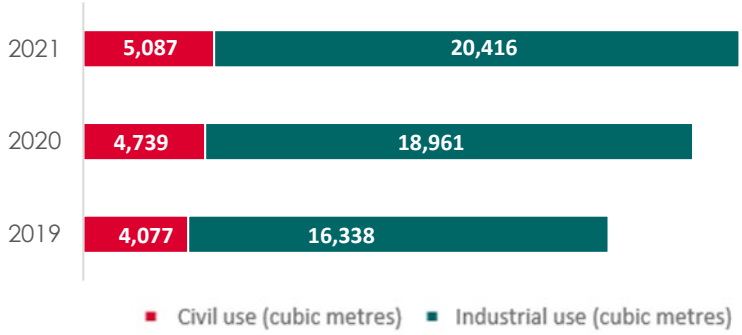
Comments on the trend

Electricity, diesel and natural gas consumption increased in 2021, mainly as a result of services being reduced during the public health emergency that had a bigger impact on 2020 consumption.

Total CO_2eq emissions (market-based)



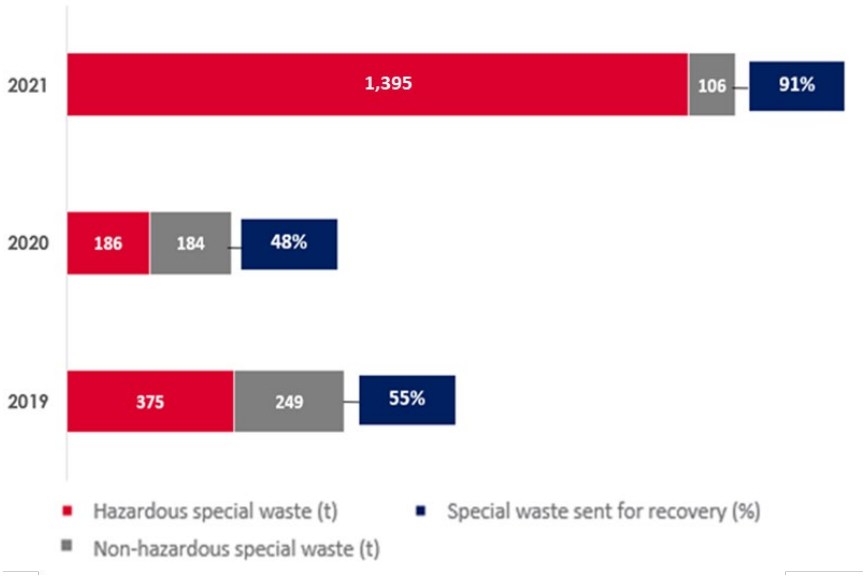
Water



Comments on the trend

The greater usage of water resources is attributable to both higher consumption of water for civil use, due to employees taking greater care over health and hygiene in the workplace, and increased consumption of water for industrial use in the vehicle washing systems as new company protocols were introduced regarding the sanitising of spaces and vehicles.

Waste



Comments on the trend

The rise in waste production in 2021 compared to previous years is mainly due to the upgrading of the Padua vehicle fleet which entailed scrapping obsolete vehicles as hazardous special waste sent for recovery.

There was a gradual decline in non-hazardous special waste. The decrease in 2021 is due to less non-hazardous special waste generated by cleaning water purification units.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	**Addition of 119 new low-emission buses (Euro 6 diesel) and one electric bus**	2021	**415,000** lt **1,100** tCO_2	✓	109 buses were sent to Padua and 11 to Rovigo. They replaced 99 Euro 2 or Euro 3 diesel buses.
	Addition of 34 new low-emission buses (Euro 6 diesel/natural gas)	2022	**98,000 lt** **263** tCO_2	📋	27 buses were sent to Padua and 7 to Rovigo. They replaced 34 Euro 2 or Euro 3 diesel buses.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

📋 in progress

✓ completed

Busitalia - Sita Nord's subsidiaries

Busitalia Campania

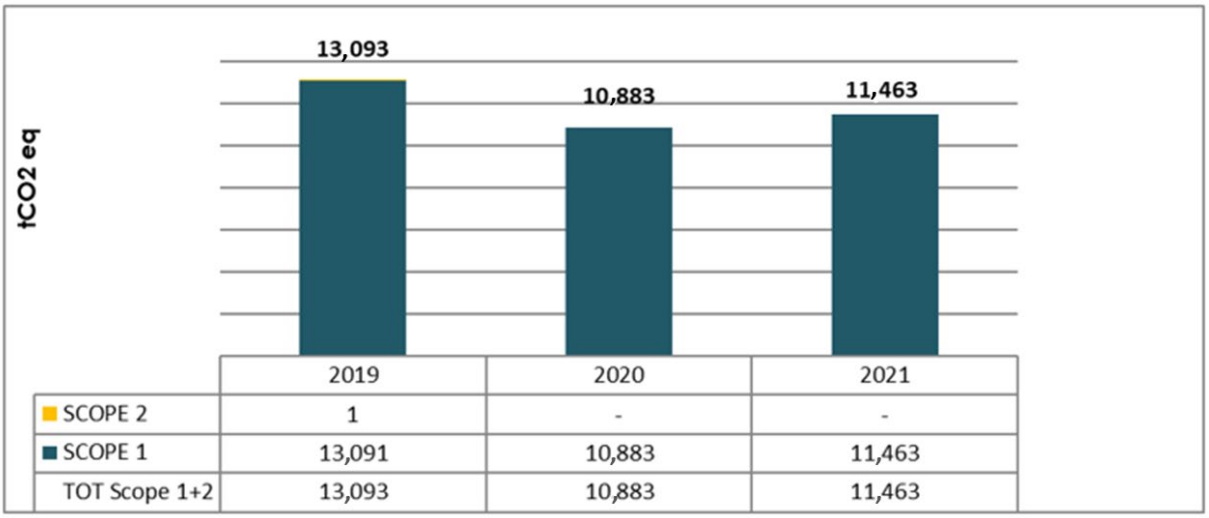
Final energy consumption

		2021	2020	2019
Electricity	MWh	587	601	642
with guarantee of origin or self-produced solar energy	*%*	*100%*	*100%*	*100%*
Diesel	l	4,026,769	3,554,352	4,199,715
Natural gas	Sm^3	324,573	670,281	908,226
Total consumption	**GJ**	**158,633**	**153,487**	**185,092**

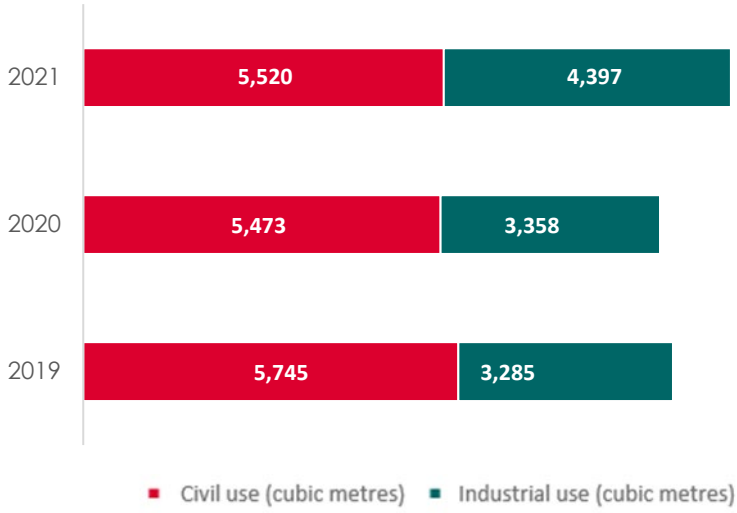
Comments on the trend

There was an increase in diesel consumption and a sharp drop in natural gas consumption in 2021 as eight natural gas buses were replaced by diesel buses.

Total CO_2eq emissions (market-based)



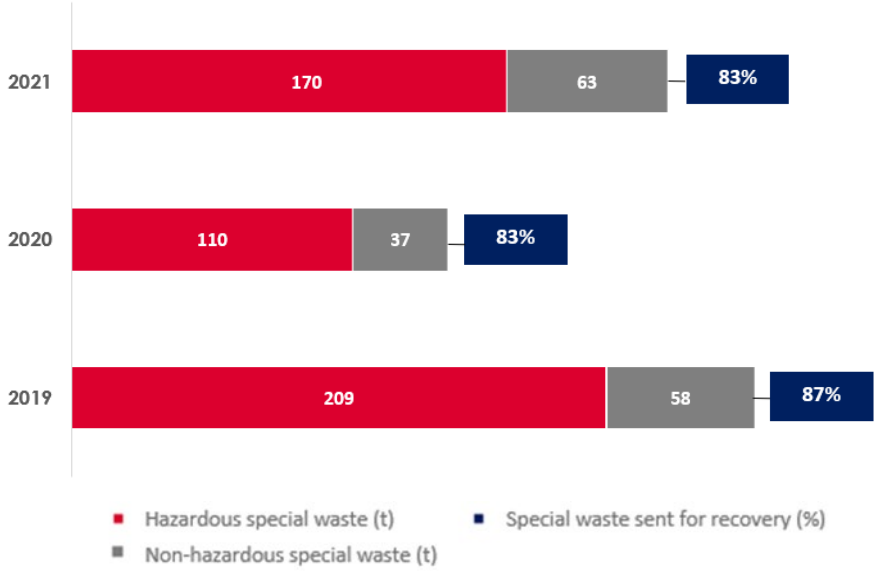
Water



Comments on the trend

The rise in consumption of water for industrial use in 2021 is a result of increased washing of buses and maintenance work on the water purification units.

Waste



Comments on the trend

The waste analysed in the graph refer to scrap material from maintenance work carried out at Busitalia Campania's own workshops. The decrease in quantities produced compared to 2019 is the normal consequence of outsourcing maintenance processes. The even larger dip in 2020 is due to the large-scale restrictions imposed during the pandemic.

The slight drop in special waste sent for recovery as a percentage of the total is due to "body shop" activities remaining in-house. The waste from such maintenance cannot be recovered.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED **Improvement in the energy efficiency of offices** through the replacement of light bulbs and fluorescent tubes with LED lights and the replacement of air conditioners.	2023	- CO_2		Postponed from 2021 to 2023.
	Replacement of 42 buses with new, higher environmental performance models (Euro 6 engines).	2021	**68 thousand litres (fuel)** **205** tCO_2	✓	
	NEW Two new Euro 6 buses will be rolled out in 2022.	2022	**3200 thousand litres (fuel)** 9.3 tCO_2		

Key

Continuous improvement | *Raw materials cycle* | *Energy and emissions* | *Water cycle* | *Land*

in progress

✓ completed

Busitalia - Sita Nord's subsidiaries

Ataf Gestioni

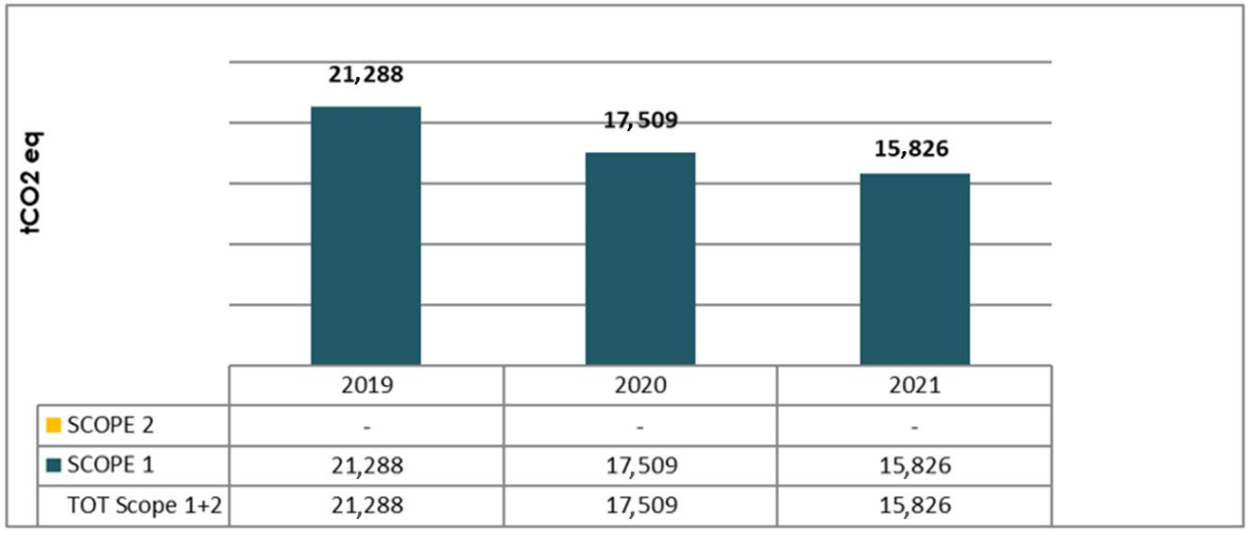
Final energy consumption

		2021	2020	2019
Electricity	MWh	1,457	1,796	2,250
with guarantee of origin or self-produced solar energy	*%*	*100%*	*100%*	*100%*
Diesel	l	5,594,941	6,112,960	7,162,507
Natural gas	Sm^3	399,100	545,939	1,027,116
Petrol	l	1,284	1,462	2,305
Total consumption	**GJ**	**220,980**	**245,951**	**302,005**

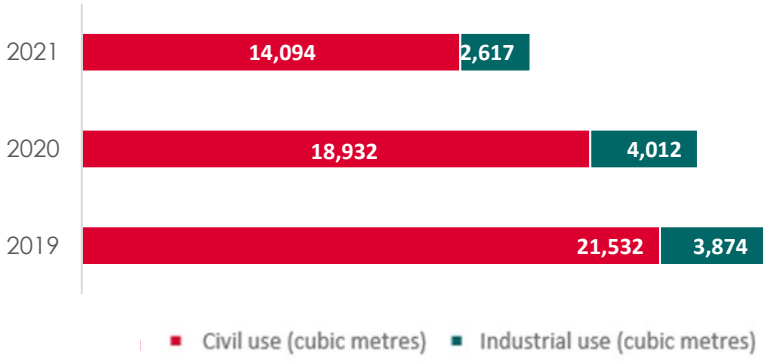
Comments on the trend

Lower energy consumption in 2021 was chiefly due the LPT service ending on 1 November when the new service provider for the Tuscany region took over.

Total CO_2eq emissions (market-based)



Water



Comments on the trend

Consumption dropped in 2021 as a result of two factors: a leak in the plant being fixed in 2020 and the LPT service ending in Tuscany on 1 November.

Waste

Comments on the trend

The rise in special waste mainly refers to packaging which accounted for the highest percentage increase for both hazardous and non-hazardous special waste. There was also another important increase in equipment no longer in use.

The preparatory work for the transfer of the Tuscan LPT service to the new operator entailed packaging many materials to be transferred and also sending materials that can no longer be used to the landfill.

Busitalia - Sita Nord's subsidiaries

Qbuzz

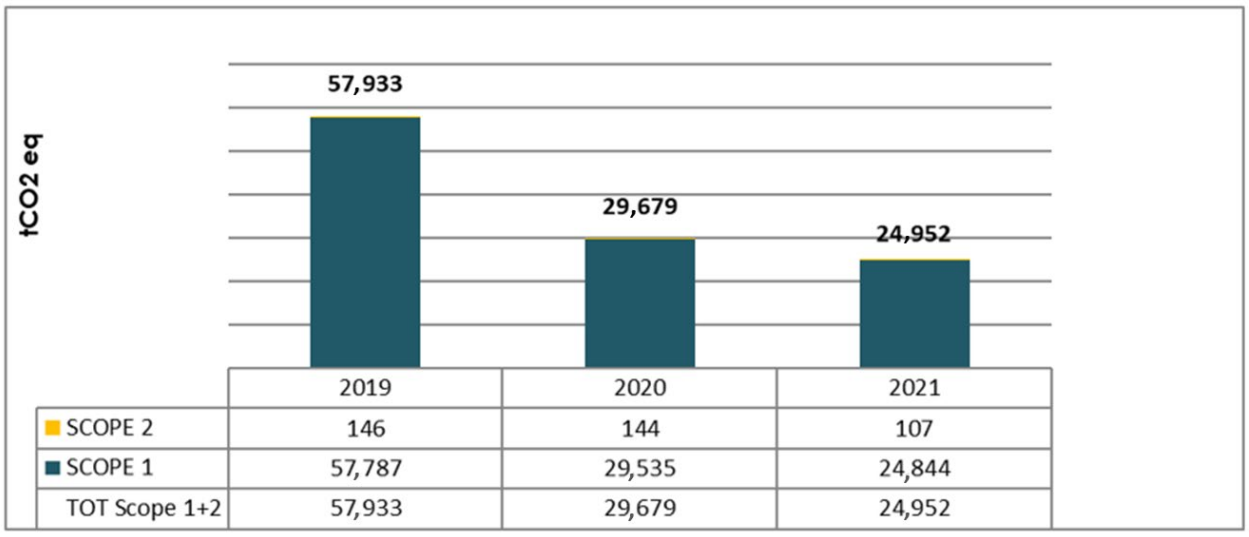
Final energy consumption

		2021	2020	2019
Electricity	MWh	34,999	28,325	17,358
with guarantee of origin or self-produced solar energy	*%*	*100%*	*100%*	*100%*
Self-produced and consumed solar energy	*MWh*	*46*	*40*	*64*
Diesel	l	9,043,751	10,774,266	21,365,298
Biodiesel	l	6,162,225	6,479,672	0
Natural gas	Sm^3	66,425	70,451	127,427
Hydrogen	kg	53,302	0	0
Other consumption	GJ	4,462	5,255	4,767
Total consumption	**GJ**	**694,476**	**739,257**	**843,041**

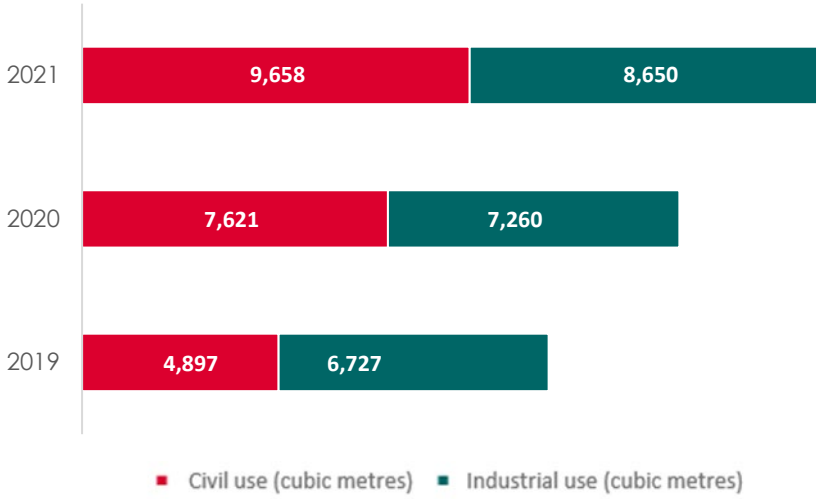
Comments on the trend

Following the addition of numerous electric buses to the fleet, electricity consumption shot up, while diesel consumption dropped off.
In 2021, 35 battery-powered electric articulated buses were rolled out in Utrect, leading to a rise in electricity consumption as they are charged with power generated by the wind farms. The buses fuelled by GTL were replaced, resulting in lower consumption of GTL.
In 2021, 20 buses powered by hydrogen cells were rolled out at Groningen Drenthe, replacing HVO buses.

Total CO_2eq emissions *(market-based)*



Water



Comments on the trend

Water consumption rose due to the addition of a new bus washing unit, office buildings and toilets compared to 2020.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Roll-out of **20 hydrogen buses into the vehicle fleet in Groningen**	2021	**448 thousand litres (fuel)** **1,375** tCO_2	✓	
	Roll-out of **35 fully-electric articulated buses** into the vehicle fleet in Utrecht	2021	**784 thousand litres (fuel)** **2,406** tCO_2	✓	
	Roll-out of **10 hydrogen buses** into the vehicle fleet in **Emmen**	2022	**224 thousand litres (fuel)** **687** tCO_2	🗒	

Key

Continuous improvement

Raw materials cycle

Energia e emissioni

Water cycle

Land

🗒 in progress

✓ completed

Mercitalia Logistics

OUR APPROACH

In accordance with the guidelines of FS Italiane group's sustainability policy and its occupational health and safety action areas and furthering its commitment to the integrated management of the requirements of major international standards, Mercitalia Logistics S.p.A. considers the quality of its services, the protection of the environment and the protection of occupational health and safety strategic elements in developing its business.

The company's commitment to the environment can be seen through the use of the railway as the preferred mode of transport in its provision of integrated logistics services, thereby gaining an advantage in terms of sustainable mobility and reducing emissions. It confirmed this sensitivity to environmental issues in the installation - back in 2007 – of a photovoltaic power station at the Roma San Lorenzo site, which contributes to achieving the pollution prevention goal by using alternative sources of energy, thus limiting CO_2 emissions into the atmosphere.

In 2017, as sub-holding company of the Mercitalia hub and to coordinate and address issues related to the environment, quality, safety and sustainability, Mercitalia Logistics S.p.A. launched the preparation and subsequent issue of the first process guidelines included in its management and coordination model of Mercitalia hub's subsidiaries.

In particular, the sub-holding company issued the safety, environment and quality process guidelines and the related operating procedures to promote the complete integration of workers' health and safety, integrated management systems, quality, the environment and sustainability in the core fields of its business and that of the Mercitalia hub.

Mercitalia Logistics also plays the role of Focal Point with regard to the areas of competence, towards FS

SpA.

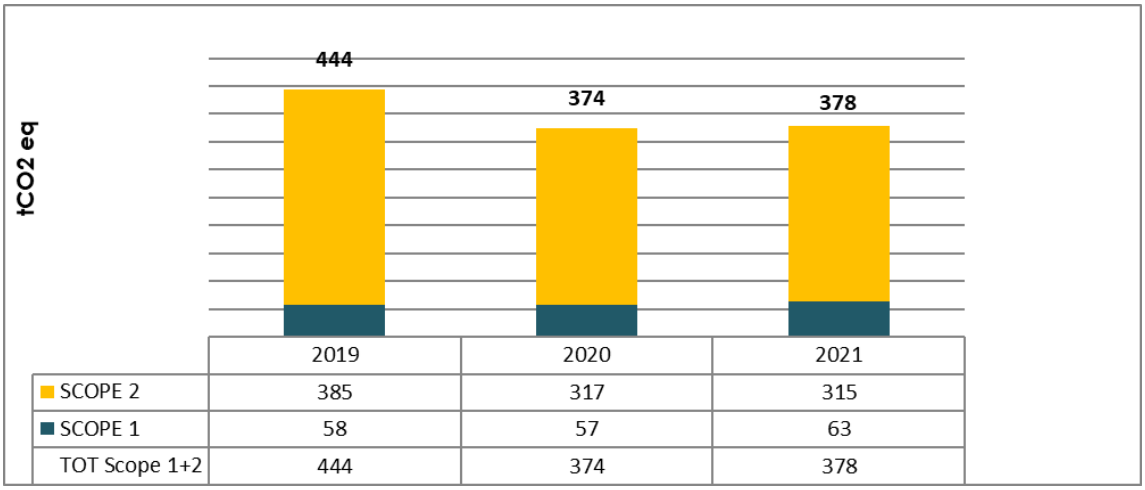
Final energy consumption

		2021	2020	2019
Electricity	MWh	2,214	2,088	2,726
with guarantee of origin or self-produced and consumed solar energy	%	70%	69%	71%
Self-produced and consumed solar energy	MWh	231	214	276
Natural gas	Sm^3	30,641	26,679	23,852
Diesel	l	596	1,073	2,744
Petrol	l	272	352	1,392
Total consumption	**GJ**	**9,051**	**8,482**	**10,774**

Comments on the trend

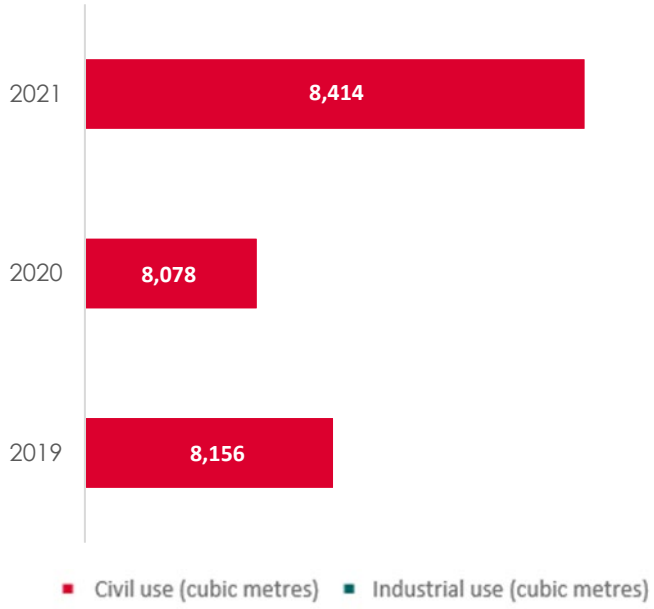
Diesel consumed for company cars decreased in 2021 as work trips were reduced due to Covid-related restrictions. Though at a reduced percentage given the lower demand for services, consumption of natural gas rose on 2020 following the partial return of employees to work spaces in spring 2020.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	385	317	315
SCOPE 1	58	57	63
TOT Scope 1+2	444	374	378

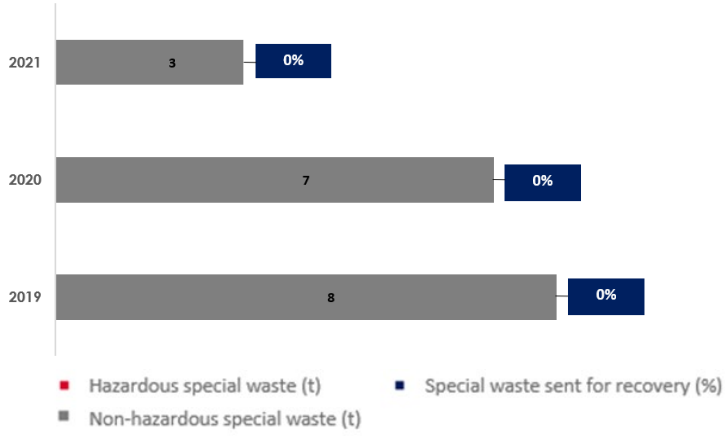
Water



Comments on the trend

Water consumption (m^3) rose slightly in 2021 following the gradual return of employees to offices. The trend remained largely constant over the three years, however, despite the lower presence of employees during the public health emergency.

Waste



Comments on the trend

The waste quantities shown in the table are attributable to the cleaning of the septic tank at the Orbassano site. Two disposals were made in 2021, compared to three in the previous years.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	**Maintaining UNI EN ISO 14001:2015 and UNI EN ISO 9001:2015 certification and renewing UNI ISO 45001:2018 certification**. In 2021, Mercitalia Logistics chose a new certifying body (SGS Italia S.p.A.) to gain new pointers for improving the integrated management system. Following the audits by the new body, the UNI ISO 45001:2018 certification was renewed and UNI EN ISO 14001:2015 and the UNI EN ISO 9001:2015 certifications were maintained.	2021	+ control	✓	
	Maintaining UNI EN ISO 14064-1:2019 certification to quantify and report on greenhouse gas emissions. The company chose the new certifying body, SGS Italia S.p.A., in 2021 so that it could implement the process to certify the GHG inventory of the FAST service using a body that is also authorised for UNI EN ISO 14064-1:2019 audits. Following the positive outcome of the audit, in December 2021, the company received certification of compliance of the inventory of greenhouse gas emissions of the MERCITALIA FAST service as per UNI EN ISO 14064-1:2019.	2021	+ control	✓	
	Updating activities to define the material topics in the Mercitalia hub materiality matrix compiled by the work group set up with group organisational notice no. 47/AD of 26 June 2020. The updated version of the hub's materiality matrix was presented to the hub committee in November 2021 and subsequently to the central structure at FS S.p.A.	2021	+ commitment	✓	
	Organising the SAFETY DAY in October 2021, during which the Safety Golden Rules were presented. On 20 October 2021, to mark the European Week for Safety and Health at Work, the Mercitalia hub organised its third Safety Day with the theme "Safety Golden Rules and teaching health and safety in the workplace". This Safety Day 2021 promoted health and safety both in the workplace and in everyday life, proposing simple rules to help adopt safe and healthy behaviour in every situation.A presentation was also given on trends in the injury rates of all Mercitalia hub companies, including the Safety Golden Rules. These latter were not designed to replace manuals and procedures, which remain the base rules to be adhered to, but rather to strengthen and stimulate our capacity to recognise and act on a danger or irregularity as soon as it arises while performing our daily tasks. Senior management and a substantial delegation of operating personnel, along with trade union representatives, took part in the event.	2021	+ commitment	✓	

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

completed

Mercitalia Logistics' subsidiaries

Mercitalia Rail

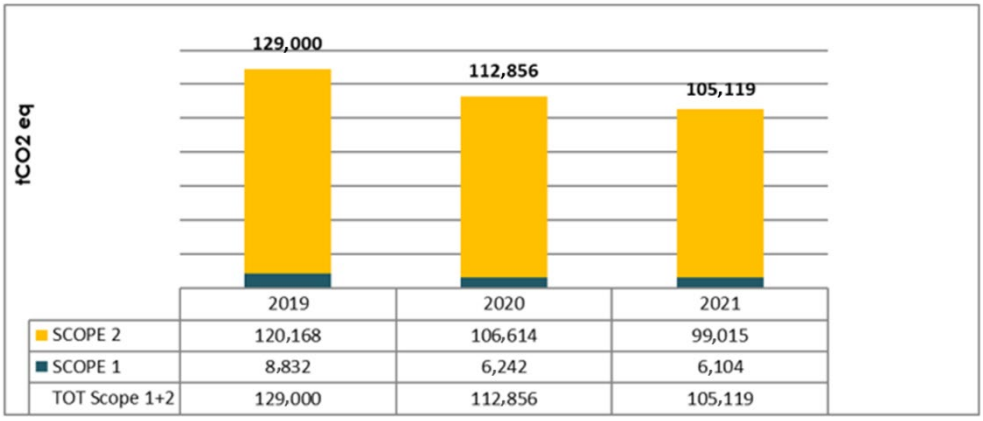
Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	353,872	355.975	375.948
Electricity for other uses	MWh	2,384	2.413	2.721
with guarantee of origin or self-produced solar energy	%	100%	100%	100%
Diesel	l	1,520,146	1.510.560	2.086.894
Natural gas	Sm^3	832,774	911.554	1.341.484
Petrol	litres	1,175	1.448	20.600
Total consumption	**GJ**	**1,366,211**	**1.376.259**	**1.485.497**

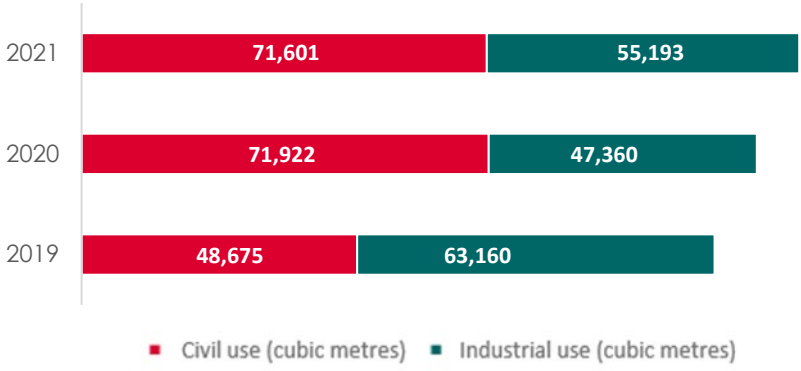
Comments on the trend

The consumption of electricity for railway traction dipped slightly in 2021.
The consumption of electricity for other uses and natural gas reflects requirements for industrial production and also takes into consideration the reduced presence of personnel in the offices during the pandemic.
Diesel consumption in 2021 was slightly above 2020 levels (due to the higher number of train km), but much lower than 2019. This considerable drop is due to the reduced usage of diesel trains for transport services, also (and above all) the outsourcing of train shunting activities to other rail operators, and, last but not least, the use of new higher-performance diesel engines.
The reduction in diesel consumption for cars was also a factor, though to a lesser degree. This was due to less cars needed during the public health emergency and the upgrading of the car fleet with vehicles with a lower environmental impact.

Total CO_2eq emissions (market-based)



Water

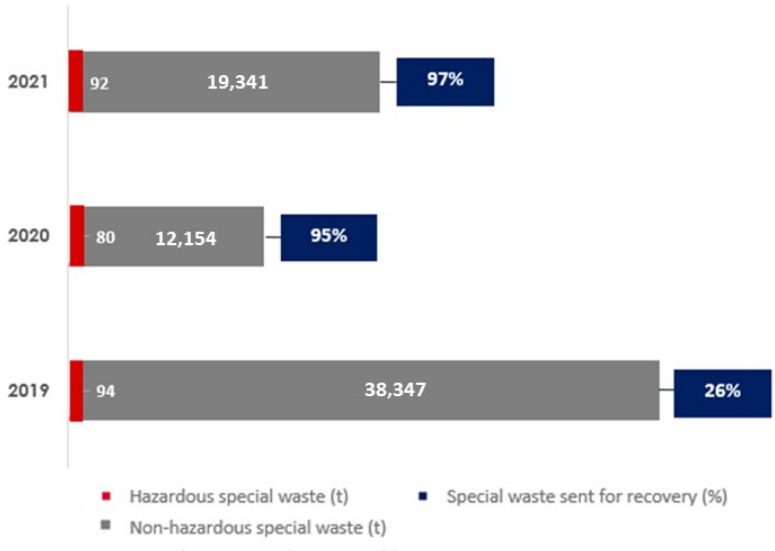


Comments on the trend

The consumption of water for civil use in 2021 remained in line with 2020. The increase on 2019 (approximately +20,000 m^3) is due to leaks at the Cervignano current maintenance plant (underground water) where a leak in the fire branch is being fixed.

Variations in the consumption of water for industrial use reflect trends in production activities.

Waste



Comments on the trend

The increase in 2021 referred to both hazardous and non-hazardous waste. Specifically, the rise in non-hazardous waste is due to a large-scale cutback of the wagon and engine fleet.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	**Acquisition and maintenance of green bonds related to the acquisition and management of rail vehicles: upgrading the fleet with electric engines, diesel engines and latest-generation wagons** improving the efficiency and sustainability of the transport service: • 40 E494 electric engines • 5 diesel engines • 240 coil wagons	2021	- 120 tCO_2	✓	The annual average CO_2 saving refers solely to the electric engines and wagons placed in service. The company completed the acquisition of new diesel engines, which are showing real energy efficiency on the field.
	**Raising awareness on the efficient use of water resources** by posting notices on how water should be used. **Systemic monitoring of water consumption** and analysing trends over time.	2021	**- 20,000 m^3 (including fixing leaks)**	✓	The notices were posted. A new initiative on disseminating consumption data is under way. Targeted actions at certain locations (e.g., Pisa Centrale, Grosseto, Livorno e Chiusi, Parma, Cervignano) to reduce/eliminate leaks.

Key

Continuous improvement

Raw materials cycle

Energy and emissions

Water cycle

Land

in progress

✓ completed

Mercitalia Logistics' subsidiaries

Mercitalia Shunting & Terminal

Final energy consumption

		2021	2020	2019
Electricity for railway traction	MWh	882	835	881
Electricity for other uses	MWh	482	419	411
with guarantee of origin or self-produced solar energy	*%*	*9%*	*10%*	*10%*
Self-produced and consumed solar energy	*MWh*	*45*	*40*	*39*
Diesel	l	3,015,689	2,267,230	2,800,000
LPG	l	52,259	38,118	65,747
Total consumption	**GJ**	**115,429**	**87,583**	**107,677**

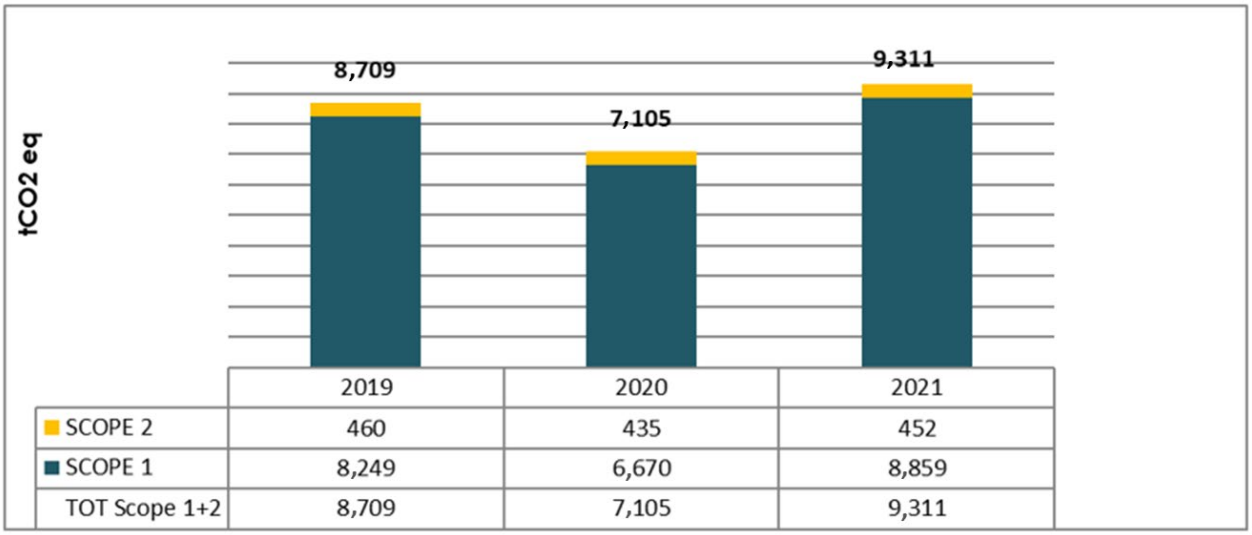
Comments on the trend

Diesel consumption rose in 2021 as operations picked up again after the considerable dip in 2020 which led to reduced consumption.

Specifically, there was an approximate 30% increase in consumption for shunting activities and a roughly 70% increase for railway superstructure activities, due to the resurgence of activities after the lockdown in 2020 (a year when superstructure activities were shut down).

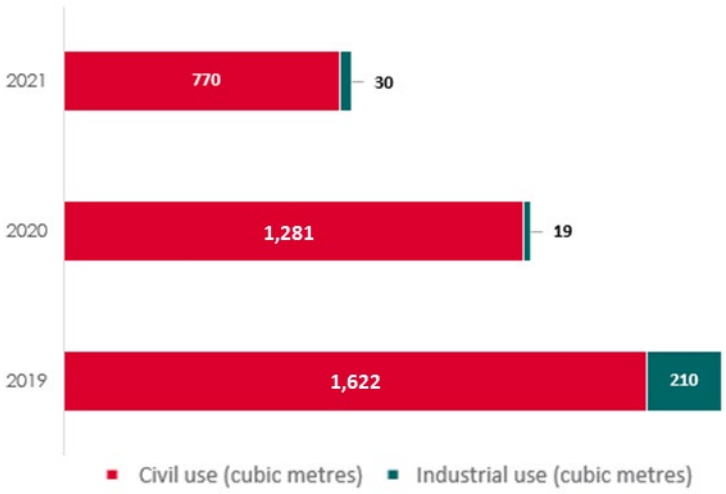
The LPG used to heat the Udine workshop also rose roughly 50% as operations became fully up and running once again.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	460	435	452
SCOPE 1	8,249	6,670	8,859
TOT Scope 1+2	8,709	7,105	9,311

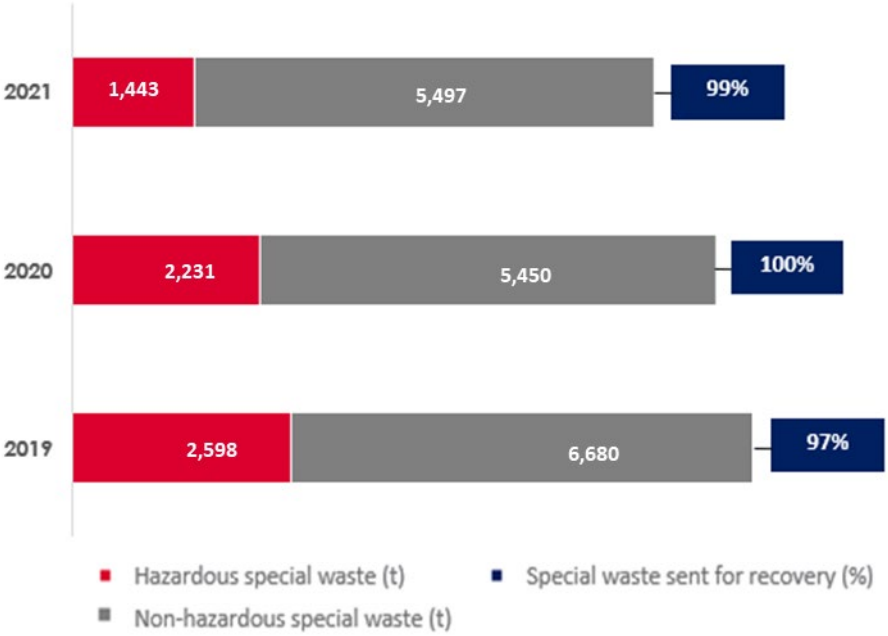
Water



Comments on the trend

Lower consumption of water for civil use due to some employees continuing to work from home due to the public health emergency.

Waste



Comments on the trend

The changes in the amount of waste produced, some of which were substantial, were due to contracts and maintenance on the superstructure by the Construction Division.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	UPDATED  **The "2.0 shunting engine revamping" project** to revamp 26 engines.	2023	- CO_2		The due dates were updated on the basis of the timeline of the new business plan.
	UPDATED  **Acquisition of six** CZ Loco 744 and 741 **shunting engines.**	2022	- CO_2		The due dates were updated on the basis of the timeline of the new business plan.
	UPDATED  **Acquisition of two diesel/electric hybrid shunting engines** at the La Spezia site.	2023	- CO_2		The due dates were updated on the basis of the timeline of the new business plan.
	Acquisition of eight hybrid (diesel/electricity from battery) **or bimodal diesel engines** (diesel/electricity from pantograph)	2025	- CO_2		
	Acquisition of four fully-electric traction engines to both replace and add to the current fleet.	2024	- CO_2		
	Acquisition of 12 latest-generation road-rail loaders to both replace and add to the current fleet.	2028	- CO_2		
	Acquisition of 12 Euro 6 or equivalent goods transport trucks to set up a new business unit.	2025	- CO_2		

Key

 Continuous improvement

 *Raw materials cycle*

 *Energy and emissions*

 *Water cycle*

 *Land*

 in progress

Mercitalia Logistics' subsidiaries

TX Logistik

Final energy consumption

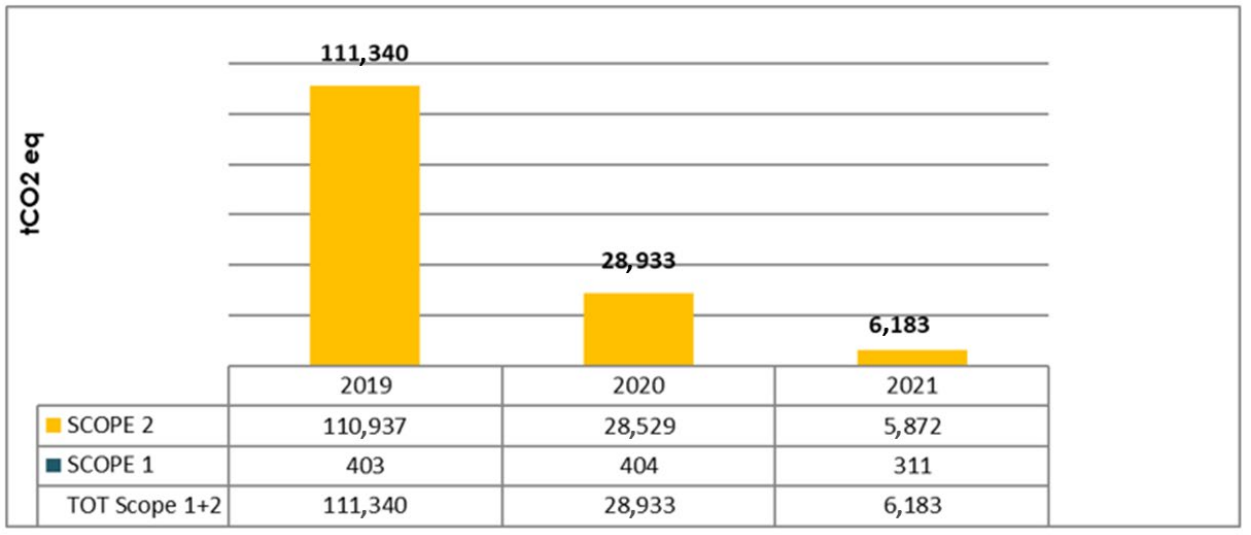
		2021	2020	2019
Electricity for railway traction	MWh	176,420	160,501	150,000
with guarantee of origin or self-produced solar energy		*89%*	*70%*	*0%*
Electricity for other uses	MWh	737	708	730
with guarantee of origin or self-produced solar energy	*%*	*0%*	*0%*	*0%*
Diesel	l	95,683	128,330	128,161
Petrol	l	22,828	25,354	25,111
Total consumption	**GJ**	**641,945**	**585,790**	**548,052**

Comments on the trend

There was a rise in both the consumption of electricity and the percentage of electricity acquired from renewable sources certified with guarantee of origin in 2021.
The former is a result of the higher total of train kilometres, while the latter is mainly due to the fact that the acquisition of green energy was extended to Austria.

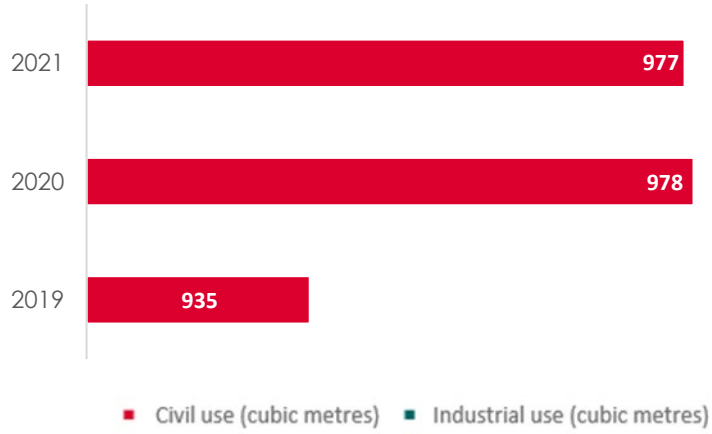
Diesel and petrol consumption decreased on the other hand, as company cars were used less during the pandemic. This reduction would have been even greater were it not for the in-sourcing of a shunting service with a diesel engine which began in 2021 for the Stellantis traffic in Lahr, with consumption totalling 2,151 litres of diesel.

Total CO_2eq emissions (market-based)



	2019	2020	2021
SCOPE 2	110,937	28,529	5,872
SCOPE 1	403	404	311
TOT Scope 1+2	111,340	28,933	6,183

Water



Comments on the trend

Water consumption remained largely unchanged on the previous years.

OUR APPROACH

FS Sistemi Urbani is responsible for developing the group's assets which are not functional for railway operations and providing integrated urban services with a business-oriented approach, as well as streamlining and improving the functioning and service offered to the public.

The company's mission is, therefore, focused on environmental aspects, handing any potentially critical environmental issues by planning and redeveloping land with intermodal and urban planning solutions.

The company began a process to implement sustainability within its governance system. This was put into practice in 2021 by implementing the parent's sustainability guidelines into a FS Sistemi Urbani Sustainability Policy. This sets out the values underlying the company's operations aimed at responsible management of its impacts on the environment, protecting the environment and preventing pollution, as well as on the communities where it operates and company personnel. The policy also details the "FS Sistemi Urbani sustainability governance", "Background analysis" and "Stakeholder engagement" procedures.

Projects and initiatives

Scope	Description	Deadline	Average annual savings/target	Status	Notes
	Urban regeneration project for the **Milano Porta Romana** hub, for a total surface area of roughly 190,000 m² with roughly 164,000 m² suitable for building on. The development includes a large park, with an area of roughly 100,000 m², surrounded by houses, offices, social housing, student housing and services interconnected with the entire metropolitan area.	2021	+ **regeneration of natural capital**	✓	The winning team was chosen for the tender to sell the area and draft the master plan.
	Brera Academy "Arts Campus" at the Farini Scalo Unit within the special Farini zone, with an extension of roughly 25,000 m² for around 3,500 students and 400 workers.	2021	+ **regeneration of natural capital**	✓	A preliminary contract was signed in December to sell a section of the building that will house the Arts Campus.
	Development of FS Sistemi Urbani areas at the **Milano Lambrate hub** for environmental and urban regeneration via the international **Reinventing Cities** competition.	2021	+ **regeneration of natural capital**	✓	The Cooperativa Sant'Ilario project was judged the winner. The preliminary sale contract for the portion of the Milano Lambrate hub was signed in December.
	Development of FS Italiane group areas at **Roma Tuscolana** for environmental and urban regeneration via the international **Reinventing Cities** competition. The project plans a green area of roughly 22,500 m², greater than that set in the urban planning regulations.	2021 competition 2023	+ **regeneration of natural capital**		The C40 Reinventing Cities competition was won by the Campo Urban team. The urban planning variation is currently being approved.
	Urban regeneration project for the Rome hub railway areas no longer in use as part of the **"green circle"** from Roma Tiburtina to Roma Trastevere	TBD	+ **regeneration of natural capital**		The general structure outline of the green circle was approved. The proposal for the urban planning variation for Roma Tiburtina was presented in December 2020 and updated in August 2021.
	Development and urban regeneration of the railway areas no longer in use in Turin with the municipal authorities and the Piedmont regional authorities. The currently planned green areas cover an area of approximately 40,000 m².	2027	+ **regeneration of environmental-urban planning capital**		Negotiations continue with the municipality's steering committee and the region's technical panel.
	Development of the **Venezia Mestre – Parco del Piraghetto** areas for urban regeneration and environmental development. The currently planned green areas cover an area of approximately 18,000 m².	2023	+ **regeneration of natural capital**		The service conference was completed and the programme contract was signed. The contract for the transfer to the municipal authorities is currently being defined.
	Development of FS Italiane group areas at the **Verona Porta Nuova** hub, turning the freight hub areas into a city park enhanced with new functions for a total surface area of 450,000 m², including 280,000 m² currently planned as green areas.	2023	+ **regeneration of natural capital**		An addendum was added to the memorandum of understanding with the Veneto regional authorities and Verona municipal authorities. The call for tenders for the urban planning variation was published
	Project for constructing a **recreational path along the retired Genoa-Ventimiglia railway line**, between San Lorenzo al mare and Andora, and redevelopment of idle areas like former freight terminals and/or retired passenger buildings	2023	+ **regeneration of natural capital**		Agreements are under way as per the 2018 framework agreement. Specifically, the preliminary sales agreements for the

	Plant to redevelop and reorganise the **Napoli Garibaldi intermodal hub**	2029	+ **regeneration of natural capital**		Talks have resumed with EAV, the Campania regional authorities and the Naples municipal authorities for drafting the technical and financial feasibility project - phase II and the subsequent calling of the service conference.
	Roll-out of process to implement **sustainability** within the FS Sistemi Urbani governance system by formalising analysis processes for internal and external factors, stakeholder engagement and fostering the integration of sustainability into the group's business management.	2021	+ **quality**	✓	The Sustainability Policy and the following operating procedures were formalised in December: – Background analysis – Stakeholder engagement Sustainability governance
	Development of FS Italiane group areas for urban regeneration and **environmental, tourism and archaeological development in the Appia Antica Park.** The roughly 100,000 m² area will be kept green.	2024	+ **regeneration of natural capital**		Negotiations continue with the park authorities and RFI Investments Division for upgrading the transport services and for the urban regeneration of the area.

Key

Continuous improvement

Raw materials cycle

Energia e emissioni

Water cycle

Land

in progress

✓ completed

Management systems

The following table shows the certification scopes for the various group companies. The "Integrated systems" column shows information on the integration of the management systems (Quality, Environment, Occupational safety).

Ferrovie dello Stato Italiane	Integrated systems: -
Environment (E)	**Ferrovie dello Stato Italiane (Headquarters)** Scope: ✓ setting the guidelines and coordinating policies and industrial strategies for the group's operating companies, implementing corporate governance processes, preparing the group's business plan, governing and monitoring corporate relationships within the group, managing relationships with the government and other institutional authorities.

RFI	Integrated systems: Q + E + S
Quality (Q)	**Commercial and Network Operation Department and Steering Departments** Scope: ✓ management of train traffic to ensure safe railway operation. **Production Department (PD) and Local Production Units** Scope: ✓ maintenance of the railway infrastructure to ensure safe train travel and railway operation and the performance of train travel and shunting activities; ✓ design in the railway engineering sector (superstructure, signalling and telecommunications systems and electrical traction), civil engineering, road engineering and environmental protection in the railway field. **National Electric Equipment Workshop - Bologna, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through the inspection, repair, rehaul and assistance for vehicles operating on the rails and railway equipment for electrical traction systems and safety and signalling systems. **National Superstructure Workshop - Pontassieve, the PD's national workshops** Scope:

	✓ maintenance to ensure safe train travel and railway operation; construction of railway superstructure equipment through mechanical processing, welding, assembly and attachment of rails and railway switches. **National Carriage Workshop - Catanzaro, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through general inspections, non-routine maintenance, 5-year checks, repairs and assistance for the vehicles operating on rails.
Environment (E)	**Central Divisions** Scope: ✓ design, construction, implementation, management and maintenance of national railway infrastructure. **Steering Divisions** Scope: ✓ management of train traffic to ensure safe railway operation. **Local Production Units** Scope: ✓ maintenance of the railway infrastructure to ensure safe train travel and railway operation and the performance of train travel and shunting activities. **National Electrical Equipment Workshop - Bologna, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through the inspection, repair, rehaul and assistance for vehicles operating on the rails and railway equipment for electrical traction systems and safety and signalling systems. **National Superstructure Workshop - Pontassieve, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation; construction of railway superstructure equipment through mechanical processing, welding, assembly and attachment of rails and railway switches. **National Carriage Workshop - Catanzaro, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through general inspections, non-routine maintenance, 5-year checks, repairs and assistance for the vehicles operating on rails.

Occupational safety (S)	**Steering Divisions** Scope: ✓ management of train traffic to ensure safe railway operation. **Local Production Units** Scope: ✓ maintenance of the railway infrastructure to ensure safe train travel and railway operation and the performance of train travel and shunting activities. **National Electrical Equipment Workshop - Bologna, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through the inspection, repair, rehaul and assistance for vehicles operating on the rails and railway equipment for electrical traction systems and safety and signalling systems. **National Superstructure Workshop - Pontassieve, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation; construction of railway superstructure equipment through mechanical processing, welding, assembly and attachment of rails and railway switches. **National Carriage Workshop - Catanzaro, the PD's national workshops** Scope: ✓ maintenance to ensure safe train travel and railway operation through general inspections, non-routine maintenance, five-year checks, repairs and assistance for the vehicles operating on rails.
Bluferries	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Safety (S)**	**Bluferries (Registered office, operating sites and owned ships)** Scope: ✓ Maritime transport using roll-on roll-off (ro-ro) ships and high-speed craft (HSC)
Terminali Italia	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Safety (S)**	**Terminali Italia (Headquarters and operating sites)** Scope: ✓ management and operation of terminals equipped for intermodal transport; ✓ provision of terminal services through shunting, container handling and accessory services.
Trenitalia	**Integrated systems: Q + E + S**

Quality (Q) **Environment (E)** **Occupational safety (S)**	**Trenitalia (Headquarters and operating sites)** Scope: ✓ design and provide integrated mobility passenger transport by rail.
Trenitalia C2C	**Integrated systems: -**
Environment (E) **Occupational safety (S)**	**Trenitalia C2C** Scope: ✓ operation and maintenance of infrastructure and the fleet controlled by C2C on the Tilbury and Southend routes arriving from and departing for London Fenchurch Street.
Busitalia - Sita Nord	**Integrated systems: Q + E + S**
Quality (Q)	**Busitalia - Sita Nord (Headquarters and regional divisions)** Scope: ✓ design and provision of transport services using buses, trolley buses, railways and ships: local public transport. Design and provision of transport services using buses: long haul lines, rentals, replacement and integrated rail services and atypical services. Roll-out of alternative mobility services (lifts, cable railways, escalators and moving walkways). Maintenance and depot facilities for its own vehicle fleet and alternative mobility. Sea works and dredging. Management of parking areas and rest areas.
Environment (E)	**Busitalia - Sita Nord (Headquarters and regional divisions)** Scope: ✓ design and provision of transport services using buses and trolley buses: local public transport. Design and provision of transport services using buses: long haul lines, rentals and atypical services. Roll out of alternative mobility services (lifts, cable railways, escalators and moving walkways). Maintenance and depot facilities for its own vehicle fleet. Management of parking and rest areas.
Occupational safety (S)	**Busitalia - Sita Nord (Headquarters and regional divisions)** Scope: ✓ design and provision of transport services using buses and trolley buses: local public transport. Design and provision of transport services using buses: long haul lines, rentals and atypical services. Maintenance and depot facilities for its own vehicle fleet.
Busitalia Veneto	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Occupational safety (S)**	**Busitalia Veneto (Headquarters and operating sites)** Scope: ✓ design and provision of transport services using buses and trolley buses: local public transport. Design and provision of transport services using buses: long haul lines, rentals and atypical services. Maintenance and depot facilities for its own vehicle fleet.
Busitalia Campania	**Integrated systems: -**

Quality (Q)	**Busitalia Campania (Headquarters and operating sites)** Scope: ✓ design and provision of transport services using buses (local public transport, long haul lines, rentals and atypical services); ✓ maintenance and depot facilities for its own vehicle fleet (Sector EA: 31 - 35).
Mercitalia Logistics	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Occupational safety (S)**	**Mercitalia Logistics (Headquarters and local units)** Scope: ✓ steering and coordinating the Mercitalia operating companies; ✓ design, organisation and coordination of logistics services in connection with sundry freight through third-party coordination; ✓ management of the company's real estate assets; ✓ design and organisation of "fast" transport services by train and logistics for sundry freight through third-party coordination.
Mercitalia Shunting&Terminal	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Occupational safety (S)**	**Mercitalia Shunting&Terminal (Headquarters, Genoa office and operating site in Udine)** Scope: ✓ design, construction, maintenance and restructuring of sidings; ✓ freight and passenger transport services as railway company in the national railway infrastructure; ✓ management of shunting in sidings; ✓ maintenance and reconditioning of diesel traction vehicles, railway rolling stock for freight transport and related services.
Mercitalia Rail	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Occupational safety (S)**	**Mercitalia Rail (Headquarters and operating sites)** Scope: ✓ design and provision of freight transport services by rail.
FS Sistemi Urbani	**Integrated systems: -**
Environment (E)	**FS Sistemi Urbani (Headquarters)** Scope: ✓ management, on its own behalf or by appointing third parties, of the company's real estate assets; ✓ real estate development, on its own behalf or by appointing third parties, of the company's real estate assets and other group companies' real estate assets not functional for railway operations; ✓ planning, development and implementation of real estate development and management processes and urban intermodal systems;

	✓ management control activities on the real estate portfolio in Salerno used by third parties.
Grandi Stazioni Rail	**Integrated systems: -**
Environment (E)	**Grandi Stazioni Rail (Roma Termini, Roma Tiburtina, Milano Centrale, Venezia S. Lucia, Torino Porta Nuova, Napoli Centrale, Venezia Mestre, Verona Porta Nuova, Bologna Centrale, Genova P. Principe, Genova Brignole, Palermo Centrale, Bari Centrale and Firenze S.M. Novella stations)** Scope: ✓ management of station complexes and development support through facility and energy management services.
Ferservizi	**Integrated systems: Q + E + S**
Quality (Q)	**Ferservizi (Headquarters and operating units)** Scope: ✓ service management: administration, procurement, real estate sales services, leases and agreements, technical asset services, maintenance and facility management services for office buildings and hotels, the issue of travel concessions, company canteen services, real estate and legal custody services, printing services, credit management, tax services, correspondence, notifications and document filing.
Environment (E) **Occupational safety (S)**	**Ferservizi (Headquarters and operating units)** Scope: ✓ provision of all the activities that the company performs to manage administrative, sale and lease of real estate, custody and safeguarding of real estate and facility services, in addition to group procurement, IT, maintenance and document filing.
Italferr	**Integrated systems: Q + E + S**
Quality (Q) **Environment (E)** **Occupational safety (S)**	**Italferr (Headquarters and operating sites)** Scope: ✓ project management, design, contracting management, works management and supervision and safety coordination for transport infrastructure work and the related interferences.
Netinera group	**Integrated systems: -**

Quality (Q)	**Netinera Deutschland** Scope: ✓ development of the group's business; ✓ management of new or existing public transport contracts in Germany and abroad; ✓ support to the affiliated companies with technical and non-technical services. **Netinera Werke** Scope: ✓ maintenance and inspection of railway vehicles in accordance with current German regulations (Railway, Building and Operating Regulations – EBO).
Environment (E)	**OHE** Scope: ✓ operating maintenance on electric trains and passenger carriages; ✓ maintenance and inspection of railway vehicles in accordance with current German regulations (Railway, Building and Operating Regulations – EBO). **Vlexx** Scope: ✓ public transport with electric and diesel buses; ✓ operating and heavy maintenance on vehicles at proprietary workshops. **Erixx** Scope: ✓ public transport with diesel buses; ✓ operating maintenance on vehicles at proprietary workshops. **Länderbahn** Scope: ✓ public transport with diesel buses and electric and diesel trains; ✓ operating maintenance on vehicles at proprietary workshops.
Anas	**Integrated systems: -**
Quality (Q)	**Anas (Central and Divisions and Regional Units)** Scope: ✓ planning, execution, monitoring and technical, administrative, legal and financial management of the planning processes for large-scale infrastructural works, roadway works contracting and the related services, works management, direct operation and surveillance of the road network, research and the testing of materials and infrastructures using innovative technologies.
TrainOSE	**Integrated systems: -**
Quality (Q)	**TrainOSE** Scope: ✓ definition of objectives and measurement of delivered service quality
Safety (S)	**EESSTY** Scope: ✓ definition of objectives and measurement of delivered service quality

Ferrovie del Sud-Est e Servizi Automobilistici	Integrated systems: Q + S
Quality (Q) **Occupational safety (S)**	**Ferrovie del Sud-Est e Servizi Automobilistici (Headquarters and operating sites)** Scope: ✓ design and provision of local public road transport services, design and provision of local railway transport services, maintenance of rolling stock, design and management (routine and non-routine maintenance) of railway infrastructures.