

# MANAGING ENVIRONMENTAL IMPACT

Protecting the environment and minimising negative environmental impacts from the Company's operations are among FPC's highest priorities. JSC FPC complies with the environmental legislation of the Russian Federation, follows the Parent Company Environmental Strategy, the JSC FPC

Development Strategy until 2030, and the Company's standard 1.16.001–2016 FPC Environmental Management System.

FPC involves investment, CAPEX, and operational initiatives in pursuit of its environmental safety goals.

## Regulatory and Environmental Aspects in relation to the Company's Operations

As of the end of 2022, JSC FPC systematically achieves the environmental indicators of the JSC FPC Development Strategy until 2030:

- Increase in the share of waste transfer for neutralisation, utilisation, treatment and recycling to **48%** of the level of waste generation
- Air pollutant emissions were reduced from 8,000 to **3,250 tonnes**
- Decrease in water resource use (water consumption) from 9.4 million to **5.2 million m<sup>3</sup>**
- Water discharge was reduced from 5.5 million to **≈3.2 million m<sup>3</sup>**

Such reduction was achieved by optimising operations and processes across the Company's branches, adopting new technology, and maintaining consistent supervision.

To reduce the anthropogenic impact of passenger services, FPC upgraded its rolling stock and facilities across its branches.

The Company prevents environmental contamination and maintains an adequate level of sanitation at rail infrastructure by acquiring only carriages equipped with environmentally friendly toilet facilities. Also, environmentally friendly toilet facilities are installed on carriages, which undergo overhaul.

### Environmental aspects

Indicators	2017	2018	2019	2020	2021	2022	Change 2022/2021, %
Waste generation, thousand tonnes	102.0	101.0	101.0	81.0	83.3 <sup>1</sup>	101.7	22.2
Pollutant discharges, thousand tonnes	3.8	3.4	3.3	3.0	3.2	3.3	0.75
Water consumption, million m <sup>3</sup>	6.7	6.5	6.4	6.0	5.7	5.2	-9.6
Water discharge, million m <sup>3</sup>	3.8	3.4	3.3	3.0	3.3	3.2	-1.2

<sup>1</sup> Compared with data included in the 2021 Report, there were changes related to methods of summarising data of branches: 2021 indicators were specified according to statistical reporting of branches, according to data from the official website of the Federal Service for Supervision of Natural Resources (Rosprirodnadzor).

Goals	Treatment
Minimising negative environmental impacts from the Company's operations	Equipping carriages with environmentally friendly facilities
	Purchasing carriages with centralised power supply and separate waste accumulation systems
	Installing high-voltage heating points at the turnaround and originating stations
Caring for human health and the environment	Revamping treatment facilities
	Retrofitting water recirculation systems to carriage washing facilities
	Gasification of boiler houses
	Upgrading water and sewer networks

## Hazardous Waste Handling

During 2022, the Company generated a total of 102,000 tonnes of waste of hazard classes I-V, of which more than 33% (about 34,000 tonnes) was waste from passenger carriage cleaning.

### Gross volume of waste generation by hazard class

thousand tonnes

Indicators	2021	2022	Change, %
Waste generation, total	83,266	101,749	22.2
Hazard Class 1	0.013	0.009	-29.1
Hazard Class 2	0.205	0.240	17.0
Hazard Class 3	0.147	0.200	36.2
Hazard Class 4	65,705	84,223	28.2
Hazard Class 5	17,197	17,078	-0.7

The increase in waste generation in 2022 is due to an increase in passenger turnover, as well as the implementation of measures for separate collection of waste.

**102,000**  
tonnes of waste

of I to V hazard classes are generated in total for 2022 in the Company

More than 48% (49,000 tonnes) of generated waste was transferred for treatment, recycling and disposal, which is 22,900 tonnes more than in 2021.

More than 48% (49,000 tonnes) of generated waste is transferred for recycling

## Volume of waste generation by type of handling

thousand tonnes

Indicators	2021	2022	Change, %
Used in own production	0.297	0.111	-62.6
Transferred for treatment, recycling, decontamination	25,971	49,071	88.9
Diverted for disposal	56,101	51,473	-8.2

The specific value of waste transferred for treatment, recycling and disposal (for passenger traffic) was 0.61 kg / thousand passenger-kilometres in 2022, which was 55% higher than in 2021 (0.39 kg / thousand passenger-kilometres).

The specific value of waste diverted for disposal (per passenger turnover) in 2022 was 0.63 kg / thousand passenger-km, 24% less than in 2021 (0.83 kg / thousand passenger-km).

## Air Protection and Climate Impact

## Company emissions by main pollutants

Indicators	2021	2022	Change, %
Pollutant discharges, tonnes	3,222	3,246	0.75
of these:			
• Solid	1,023	1,032	0.86
• Sulfur dioxide	466	480	3.00
• Carbon oxide	1,290	1,327	2.87
• Nitrogen oxides (converted to NOx)	212	216	1.93
Specific pollutant discharge, kg / thousand passenger-km	0,048	0,040	-16.29

In the reporting year, the Company's gross pollutant emissions amounted to 3,246 tonnes, which is 0.75% higher than in 2021.

A slight increase in pollutant emissions is due to increased coal consumption in 2022 as compared to 2021.

At the same time, the specific pollutant emissions (per passenger turnover) in 2022 was 0.040 kg / thousand passenger-km, which is 16% lower than in 2021 (0.048 kg / thousand passenger-km).

The main Company's measures to reduce pollutant emissions into the air include the gasification of boiler houses,

construction of high-voltage posts for heating passenger carriages in the turnover and makeup points, and reduction in the consumption of coal and fuel oil.

The following was accomplished in 2022:

- 433 carriages with centralised power supply were purchased
- High-voltage heating posts were installed at the turnaround and makeup points: at the Dacha Dolgoruky maintenance points of the Northwest Branch and the Anapa and Novorossiysk Passenger Carriage Depot of the North Caucasus Branch

Greenhouse gas emissions (scope 1)<sup>1</sup>

Direct greenhouse gas emissions converted to CO <sub>2</sub>	2020	2021	2022	Change 2022/2021, %
Gross, thousand tonnes CO <sub>2</sub> -eq	238.9	256.0	260.0	2
Specific, kg CO <sub>2</sub> -eq / thousand passenger-km	4.96	3.81	3.20	-16

Indirect greenhouse gas emissions (scope 2)<sup>2</sup>

Indirect greenhouse gas emissions converted to CO <sub>2</sub>	2020	2021	2022	Change 2022/2021, %
Gross, thousand tonnes CO <sub>2</sub> -eq	100.1	102.0	98.0	-4
Specific, kg CO <sub>2</sub> -eq / thousand passenger-km	2.08	1.52	1.21	-20

A slight increase in direct greenhouse gas emissions is associated with an increase in coal consumption in 2022, relative to 2021.

At the same time, specific direct greenhouse gas emissions in 2022 (per passenger turnover) amounted to 3.20 kg CO<sub>2</sub>-eq / thousand passenger-km, which is 16% lower than in 2021 (3.81 kg CO<sub>2</sub>-eq / thousand passenger-km).

The reduction in greenhouse gas emissions is achieved through the following.

1. Energy efficiency – the Company is taking measures to reduce energy consumption and greenhouse gas emissions:
  - Purchasing new, advanced, and energy-efficient rolling stock
  - Using energy-saving technologies in the Company's depot and site lighting systems (LEDs and smart control systems)
  - Introducing modern water boilers and steam boilers at power facilities
  - Decommissioning and conservation of low-efficient facilities

- Development of the charging infrastructure (construction of charging columns and high-voltage carriage heating columns)
  - Equipping buildings and facilities with heat and power metering devices
2. Decarbonisation of the fuel balance – measures are taken to reduce the share of coal and fuel oil in the Company's fuel balance:
    - Implementing projects to upgrade boiler houses and convert them from solid/liquid fuel to gas
  3. Reduction of emissions in the production process – the Company uses technologies and methods that reduce greenhouse gas emissions in the production process:
    - Switching to separate waste accumulation in order to reduce the share of waste going to landfill
    - Using biofuels
  4. Management of emissions from vehicles – the Company takes measures to reduce greenhouse gas emissions from transport operations:
    - Renewing the fleet (operating more efficient vehicles and reducing fuel consumption)

<sup>1</sup> The calculation was carried out in accordance with the Order of the Russian Ministry of Natural Resources and Environment No. 300 dated 30 June 2015 On Approval of Methodological Guidelines and Guidelines for Quantification of Greenhouse Gas Emissions by Organisations Carrying out Economic and Other Activities in the Russian Federation. Direct CO<sub>2</sub> emissions from biomass combustion (biomass products, including pellets and briquettes) are not included in the total in because it is assumed that the growth of biomass due to photosynthesis absorbs as much carbon dioxide from the atmosphere as is later emitted back during combustion.

<sup>2</sup> Evaluation of indirect greenhouse gas emissions (Scope 2) was performed on the basis of the Methodology for Determination of Greenhouse Gas Emissions of the Parent Company. No evaluation of indirect non-energy greenhouse gas emissions (Scope 3).

## Sustainable Water Use

### Total water use (water consumption)

million m<sup>3</sup>

Indicators	2021	2022	Change, %
Water consumption, total	5.70	5.15	-9.6

### Total water discharge

million m<sup>3</sup>

Indicators	2021	2022	Change, %
Total water discharge	3.27	3.23	-1.2

#### Including:

• Wastewater discharge into the environment	0.06	0.04	-33.3
• Discharge of wastewater into centralised wastewater disposal systems	3.21	3.19	-0.6

In order to reduce the amount of waste water that may have a negative impact on the environment and operation of centralised wastewater disposal systems, the Company implements programs for retrofitting treatment facilities and carriage washing facilities by furnishing them with a closed-loop water supply system and local treatment facilities.

In particular, the following works are carried out:

- Retrofitting carriage washing facilities featuring water recirculation systems
- Upgrading water supply and sewer networks
- Retrofitting the Company's buildings and structures with water consumption and discharge meters

## ENERGY EFFICIENCY

To improve energy efficiency and reduce the energy intensity of its operations, JSC FPC works to restrict its fuel and energy consumption every year.

The following measures have been implemented in 2022:

- Purchasing new, advanced, and energy-efficient rolling stock
- Using energy-saving technologies in the Company's depot and site lighting systems (LEDs and smart control systems)

- Upgrading and converting boilers from liquid fuels to gas
- Retrofitting the Company's buildings and structures with water consumption and discharge, electricity and heat meters
- Installing high-voltage charging points at passenger train preparation sites

## Progress in the Use of Fuel and Energy Resources

### Use of fuel and energy resources in physical terms

Resources	2020	2021	2022	Change 2022/2021, %
Electric energy, million kWh	107.738	111.942	113.134	1.1
Diesel fuel, thousand tonnes	1.947	3.139	1.646	-47.6
Coal, thousand tonnes	76.982	79.198	84.627	6.9
Fuel oil, thousand tonnes	10.126	10.797	9.998	-7.4
Natural gas, million m <sup>3</sup>	19.312	22.917	22.744	-0.8
Petrol, thousand tonnes	0.610	0.603	0.591	-2.0
Briquettes, thousand tonnes	2.409	2.725	2.575	-5.5
Pellets, thousand tonnes	0.534	0.452	0.280	-38.1
Firewood, thousand m <sup>3</sup>	0.092	0.074	0.080	6.9
<b>Total, thousand conventional tonnes</b>	<b>139.294</b>	<b>150.231</b>	<b>153.099</b>	<b>1.9</b>

### Use of fuel and energy resources in monetary terms

RUB million

Resources	2020	2021	2022	Change 2022/2021, %
Electric power	605.4	662.7	699.4	5.5
Diesel fuel	85.7	150.2	89.6	-40.3
Coal	277.0	279.0	362.4	29.9
Fuel oil	107.8	213.2	205.9	-3.4
Natural gas	114.2	139.9	148.3	6.0
Petroleum	33.3	32.8	34.0	3.6
Briquettes	20.1	22.4	25.5	13.9
Pellets	4.0	3.3	2.3	-31.5
Firewood	0.3	0.2	0.4	82.5