

## MANAGING ENVIRONMENTAL IMPACT

Protecting the environment and minimising negative environmental impacts from the Company's operations are among FPC's highest priorities.

In its environmental activities, FPC complies with Russian laws, the Environmental Strategy of Russian Railways, and JSC FPC's standard for Environmental Management System, 1.16.001-2016.

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

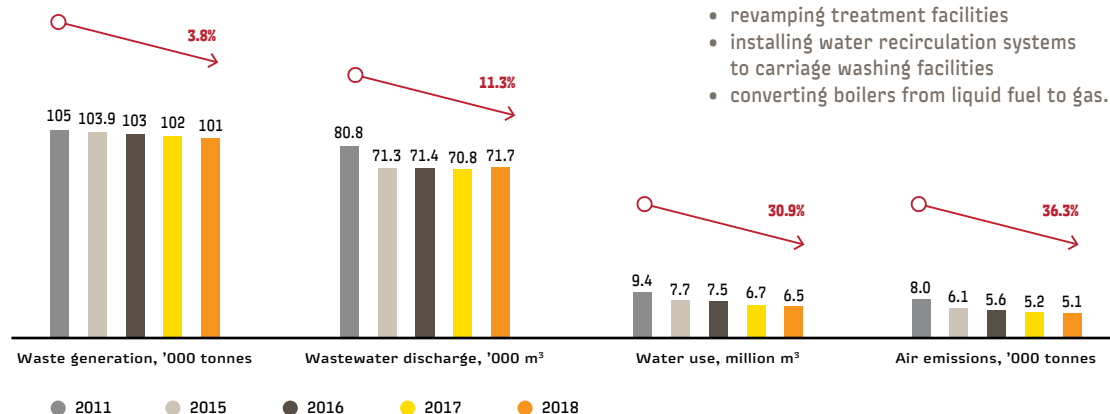
### REGULATORY AND ENVIRONMENTAL ASPECTS

#### Goals:

- minimising negative environmental impacts from the Company's operations
- promoting care for health and the environment.

#### Significant environmental initiatives:

- equipping carriages with environmentally friendly toilet facilities
- purchasing carriages with a central power supply
- installing high-voltage heating points at turnaround and originating stations
- revamping treatment facilities
- installing water recirculation systems to carriage washing facilities
- converting boilers from liquid fuel to gas.



Overall, since the start of its operations, FPC has consistently achieved annual reductions in its environmental impacts:

- production and consumption waste has decreased from 105,000 tonnes to 101,000 tonnes, including by 900 tonnes in 2018
- total used water discharge has decreased from 5.451 million m³ to 3.397 million m³, including by 0.429 million m³ in 2018 (discharge to ground surface or surface water – from 80,800 m³ to 71,700 m³ of wastewater, 59,000 m³ of which meet regulatory clean-up levels)
- water use by structural units has decreased from 9.4 million m³ to 6.5 million m³, including by 0.3 million m³ in 2018
- air emissions decreased from 8,000 tonnes to 5,100 tonnes, including by 200 tonnes in 2018

The reduction of the negative impact of the Company on the environment was achieved through the optimization of production activities, technological processes in the structural divisions of branches, the introduction of new technologies and monitoring activities on an ongoing basis.

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## OPERATING ENVIRONMENTAL EXPENDITURES

To reduce the man-made impact of passenger services, FPC upgraded its rolling stock and facilities across its branches in 2018.

The Company keeps tracks from becoming polluted while maintaining an adequate level of sanitation at rail infrastructure facilities by only acquiring carriages equipped with environmentally friendly toilet facilities, while old carriages have bio toilets installed during overhauls.

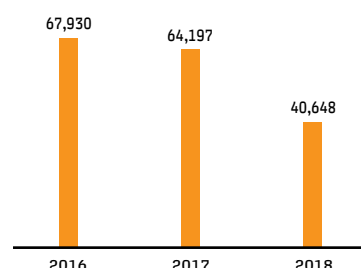
As at the end of 2018, the number of carriages equipped with environmentally friendly toilet facilities totalled 10,565 (about 60% of the total). At the current rate of rolling stock replacement and upgrades, over 90% of carriages will be equipped with bio toilets by 2025.

## AIR POLLUTION CONTROL

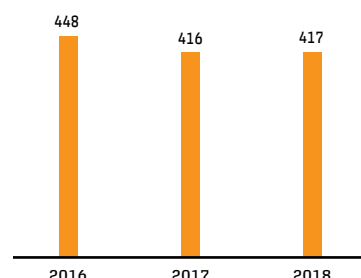
In an effort to reduce air pollution, FPC is installing boilers fired with environmentally friendly fuels and installing high-voltage points for heating its passenger carriages at turnaround and originating stations.

- Purchasing carriages with a central power supply:
  - a total of 1,014 carriages equipped
  - 161 carriages planned for procurement in 2019.
- Installing high-voltage heating points at turnaround and originating stations: RUB 24.56 million
  - installed a high-voltage heating point at service yard No. 1 of Nikolaevka station
  - upgraded the high-voltage heating point at Kaliningrad station
  - set up high-voltage heating columns at Adler station
  - built a high-voltage heating facility at Petrozavodsk station.
- Converted boilers from liquid fuel to gas in 2018: RUB 55.5 million
  - Saint Petersburg–Moskovsky carriage site (CS)
  - Perm passenger carrier depot (PCD).

**ENVIRONMENTAL EXPENDITURES,**  
**'000 RUB**



**GREENHOUSE GAS EMISSIONS,**  
**'000 TONNES OF CO<sub>2</sub>**



## SPECIFIC CO<sub>2</sub> EMISSIONS PER PASSENGER CARRIED

MODE OF TRANSPORT	TONNES PER PASSENGER	KG PER PASSENGER
Aviation	0.163	163
Rail	0.004	4

## SUSTAINABLE WATER USE

FPC's annual programmes revamping its water treatment and carriage washing facilities (CWF) reduce the negative impacts of wastewater on the environment and centralised water disposal systems, with initiatives including the installation of water recirculation systems and on-site water treatment facilities.

- Installing water recirculation systems to carriage washing facilities: RUB 183.078 million
  - Saratov PCD CWF
  - Saint Petersburg–Moskovsky CS.
- Revamped CWF treatment facilities: RUB 51.608 million
  - Khabarovsk PCD
  - Severobaikalsk CS .

- Upgraded water and sewage networks: RUB 13.677 million
  - revamped the year-round water gallery at the Chita CS
  - upgraded the cold water supply system at the Kirov PCD
  - revamped the public sewer at the train service shop of the Severobaikalsk CS (FEED)
  - revamped the building sewage system at the Ufa CS technical passenger station (FEED) with connection to the heat and water supply system.

### TOTAL USED WATER DISCHARGE, MILLION M<sup>3</sup>

INDICATORS	2017	2018
Wastewater meeting regulatory clean-up levels (surface wastewater from operating sites)	0.0589	0.0587
Contaminated wastewater (hand washing in carriages)	0.012	0.012
Sent for treatment (sewage)	3.755	3.326
<b>Total</b>	<b>3.826</b>	<b>3.397</b>

## DISPOSAL OF PRODUCTION AND CONSUMPTION WASTE

In 2018, production and consumption waste totalling about 100,000 tonnes of various hazard classes was generated across the branches:

- 400 tonnes – disposed of at the Company's own sites (class 5 waste)
- 100,300 tonnes – transferred to other companies under contracts, including:
  - 28,800 tonnes for recycling
  - 1,700 tonnes for neutralisation
  - 69,900 tonnes for disposal at landfills.

### TOTAL WASTE MASS BY HAZARD CLASS, TONNE

HAZARD CLASS	2017	2018
Class 1	21.4	20.9
Class 2	212.8	103.1
Class 3	1,383.3	1,123
Class 4	63,393.9	65,687.6
Class 5	36,581.6	33,758.4
<b>Total</b>	<b>101,593</b>	<b>100,693</b>

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## TOTAL WASTE MASS BY DISPOSAL METHOD, TONNE

DISPOSAL METHOD	2017	2018
Disposal at the Company's sites (hazard class 5)	668	393
Transferred to contractors:	100,937	100,346
for neutralisation	1,330	1,651
for recycling	26,325	28,775
for landfill	73,282	69,920

## ENERGY CONSUMPTION

In efforts to save energy and increase energy efficiency in 2018, FPC continued its focused activities reducing operating costs of fuel and energy management while introducing new resource and energy-saving technologies.

**FPC reduced its energy consumption and improved its energy efficiency through the following projects:**

- procured new, advanced, and energy-efficient rolling stock
- installed energy-saving technologies such as LEDs and smart lighting systems at FPC's depots and sites
- upgraded boiler facilities by installing advanced and more efficient boilers
- equipped FPC's buildings and structures with meters for water consumption and discharge, electricity, and heat energy
- installed high-voltage charging points at passenger train preparation sites across branches
- optimised passenger carriage depots and sites.

## FUEL AND ENERGY CONSUMPTION

TYPE	IN NOMINAL TERMS			BY VALUE, RUB MILLION		
	2017	2018	CHANGE 2018/2017, %	2017	2018	CHANGE 2018/2017
Electricity, million kWh	129.3	129.3	100.0	645.1	644.3	-0.8
Diesel fuel, '000 tonnes	2.5	2.6	102.9	92.7	107.6	14.9
Coal, '000 tonnes	106.3	109.3	102.8	280.3	324.3	44.0
Fuel oil, '000 tonnes	17.3	15.0	87.1	200.1	228.0	27.9
Natural gas, million m <sup>3</sup>	23.3	23.2	99.4	133.4	132.8	-0.6
Gasoline, '000 tonnes	0.89	0.85	96.6	41.0	43.5	2.5
Briquettes, '000 tonnes	3.0	3.4	113.8	17.0	23.9	6.9
Pellets, '000 tonnes	1.1	1.2	102.8	9.5	8.8	-0.7
Wood, '000 m <sup>3</sup>	0.76	0.31	41.0	2.8	1.9	-0.9