SUSTAINABLE DEVELOPMENT TARGETS



BASIC RESULTS OF JSCo "RZD" ENVIRONMENTAL ACTIVITY



pollutants from stationary sources, thous, tons

yearly CO, emission in rail transport operations, mln tons

SAVING

1 TERRESTRIAL

ECOSYSTEMS

dirty discharges into water bodies, mln m³



Results of JSCo RZD environmental activity



Targeting and satisfying new requirements of clients and passengers (2018-2025)

REQUIREMENTS TODAY

REQUIREMENTS IN 2025



ECOLOGICAL EFFICIENCY OF THE NEW SILK ROAD



Developing railway infrastructure to increase the transit container traffic



Coal and bulk oil cargos shipment dynamics in 2017-2025



Oil and petroleum products

- 📕 Coal
- Ferrous metals and ore
- Other cargoes*



INNOVATIONS IN DEVELOPMENT AND DEPLOYMENT OF LOCOMOTIVES ON NATURAL GAS MOTOR FUEL



developed in 2007



developed in 2013

gas turbine locomotive

Fuel: liquefied natural gas

Mainline

GT1h-002

Engine: NK-361

Power: 8500 kW

Fuel load: 20 tons

capacity: 1000 km

One-fuel filling



developed in 2013



Gas diesel shunter TEM19h

Engine: 491GD

Power: 1000 kW

Fuel: liquefied natural gas

Fuel load: 5 tons

Time between refueling: 7 days





FOR SUSTAINABLE DEVELOPMENT

30% lower is the GT1h lifecycle cost in operation than that of 2TE116 series diesel locomotives

5 times lower are hazardous emissions of GT1h

than EU directive 2012 requirement for diesels. External noise level is conformant with GOST 12.02.056 and GOST R 50951

20 patents protect the technical solutions implemented in GT1h, including 4 international ones

40 mainline gas turbine locomotives will be supplied to JSCo "RZD" by 2020

Mainline gas turbine locomotive GT1h-001

Engine: NK-361

Power: 8500 kW

Fuel: liquefied natural gas

Fuel load: 17 tons

One-fuel filling capacity: 700 km

Main distinctive design features of GT1h-002

- removable tank container
- hybrid power system with electricity storages
- higher fire and explosion safety gas treatment system

REDUCTION OF NEGATIVE ENVIRONMENTAL EFFECTS BY CHANGING WOODEN SLEEPERS WITH CONCRETE ONES IN THE TRACKS



Passenger turnover dynamics in 2017-2025

2.9%

4.2%





4-х местное купе.



Одноместное купе. Положение для сидения.



LAUNCH OF PASSENGER RAIL SERVICES IN MOSCOW CENTRAL CIRCLE

University of the second secon		Goals: to reduce the traffic congestion in Moscow, transition to a new level of quality of urban rail passenger service, expand the possibilities of travel in the capital as well as between Moscow and suburbs	
		Reduction in the fleet of vehicles, thous. units	2
Menazonaenaen (Secondaria Secondaria) Contractione Contractione Contr		Potential reduction of hazardous emissions, thous. tons/year	13.1
Baguacce Baguacce Cesa cronolscola		Reduction on greenhouse gases, thous. tons of CO ₂	1350
ength, <mark>km</mark>	54		¥ K
tops, <mark>qty</mark>	30		
f them: ransport interchange hubs, <mark>qty</mark>	19		
ansfers to metro, qty	12	Molo	dejno.Ri
ansfers to radial lines, <mark>qty</mark>	6		
ptions of transfers in travel around the city, opt.	350		
020 expected ridership, <mark>mn trips per year</mark>	282		

Among key results – better ecological and transport environment in the city

REGENERATIVE BRAKING AS A SOURCE OF 'CLEAN' ELECTRICITY FOR TRANSPORTATION OF FREIGHT AND PEOPLE



D bn kWh of regenerated electricity will be reused by electric trains of RZD in 2018

IMPLEMENTING THE 'SMART RAILWAY STATION' CONCEPT



CHEAP AND CLEAN



The 'Smart Railway Station' concept is a must in developing projects of new construction and reconstruction of railway stations and transport hubs in JSCo "RZD"

The concept contains over **80 BATs** in safety, energy efficiency, environmental protection, informatization, and unified control of railway station will utility systems

Deployment of the Concept at **Anapa** station allowed for providing autonomic **power and heat supply** only **from renewable energy sources**.







HANDLING WASTE IN JSCo "RZD"





The project of separate collection of waste covers more than 2 thousand office buildings and stations of Russian railways in 73 regions of Russia



by 1344 **tons**

or 538 thous. packs of paper it is expected to reduce the consumption of office paper in JSCo "RZD" in 2015

4.9 MN wooden sleepers will be recycled in 2015 using environmentally friendly technologies

2.7 mn reinforced concrete sleepers will be recycled for reuse in construction

15 SAVING TERRESTRIAL ECOSYSTEMS

RESPONSIBLE CONSUMPTION

AND PRODUCTION

207.1 tons of paper per year, or **4,970** trees, will be saved by deploying e-tickets for passenger trains at the company





Key parameters of the 2025 Eastern Polygon railway infrastructure development project



II. Reduction of time of container shipment by rail, in particular from Far East to western border of Russia to 7 days, and increase of transit traffic of containers by rail by 4 times

RUB 202 bn, incl. RUB 180 bn from Federal Budget (the project covers the whole rail network)

WIDER USE OF RENEWABLE ENERGY SOURCES PROGRAM



64 obsolete boiler houses of JSCo "RZD" (on coal and heavy oil) are closed in Russia over last five years in implementation of the Wider Use of Renewable Energy Sources program at railway facilities





Combined electrical power supply system for Zelenogradsk station of Kaliningrad railway



Under the JSCo "RZD" heat supply upgrading program in Kaliningrad region, heat supply systems of 13 facilities were switched to renewables, with obsolete coal-fired boiler houses closed

MITIGATION OF ADVERSE ENVIRONMENTAL EFFECTS OF PASSENGER TRAFFIC

207.1 tons of paper per year, or **4,970** trees, will be saved by deploying e-tickets for passenger trains at the company



7959 passenger cars were provided with environmentally-friendly toilets between 2004 and 2015



Этот вагон оборудован экологически чистым биотуалетом





24 times lower is the consumption of coal for



the heating of passenger trains over the last seven years thanks to acquisition of modern

rolling stock and measures to switch passenger car heating to electricity and pellet fuel, which allowed for reducing CO2 emissions by 288 thous. tons, solid particles by 76 thous. tons





