



GAS ENGINE LOCOMOTIVES OF THE RUSSIAN RAILWAY



Department of Technical Policy JSCo «RZD»
BORIS IVANOV

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CHRONOLOGY OF THE GAS-PISTON MAIN GAS TURBINE LOCOMOTIVE ГТ1h-002 2015 – 2017 y.y.



On November 11, 2015 – the beginning of under control operation of the Gt1h-002 gas turbine locomotive on a site the Equipment room – Egorshino – Serov-Sortirovochny SwRW



On May 23, 2016 – experimental trip Gt1h-002 with train No. 9759 weighing 8445 tons , 400 осейпо to a site Surgut – Voynovka Svzhddlinoy of 696 km



On October 13, 2016 – MVK meeting by results of end of a cycle of tests Gt1h-002 in JSC VNIKTI Kolomna

December 15, 2016 – LTZ is received the CERTIFICATE OF CONFORMITY on Gt1h-002, granting the right of serial release of these locomotives



On February 14, 2017 – the Act No. 001 of final acceptance of the main Gt1h-002 gas turbine locomotive by operational locomotive depot of Egorshino of Sverdlovsk management of draft is issued.

THE MAIN GAS TURBINE LOCOMOTIVES WORKING AT LNG

ГТ1h-001



ГТ1h-002



Technical characteristics

Power, kWt	8300
Quantity of traction axes	12
Force of draft of the long mode, kN	630
Reserve of fuel, tons	17
Course stock without refueling, km	700

Technical characteristics

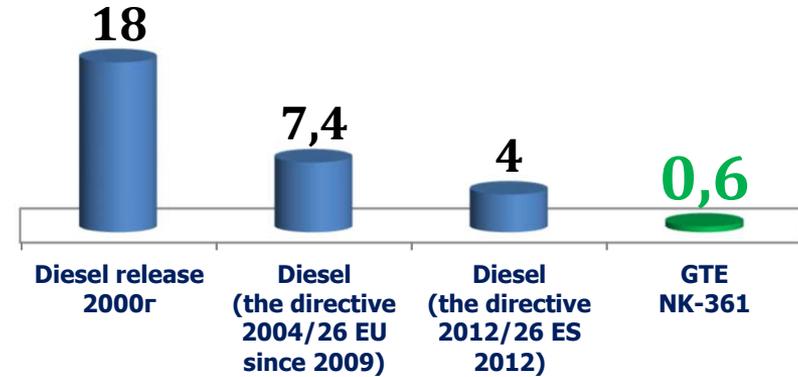
Power, kWt	8500
Quantity of traction axes	16
Force of draft of the long mode, kN	700
Reserve of fuel, tons	20
Course stock without refueling, km	700

THE MAIN GAS TURBINE LOCOMOTIVES WORKING AT LNG ECOLOGICAL CHARACTERISTICS

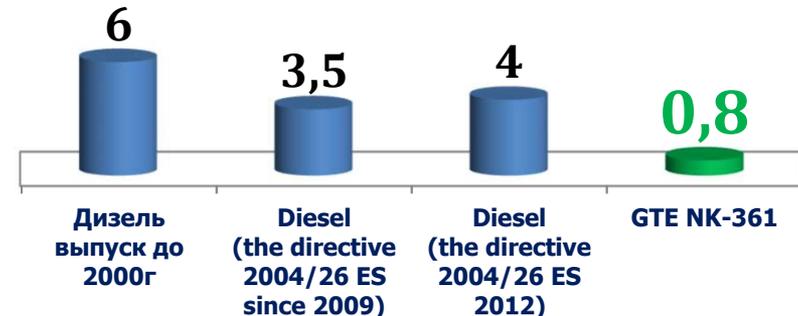


Level of harmful emissions when using Gt1h in 5 times are lower than standard requirements for diesel engines, the level of external noise conforms to standard requirements

Emissions NO_x, g/kWt*h

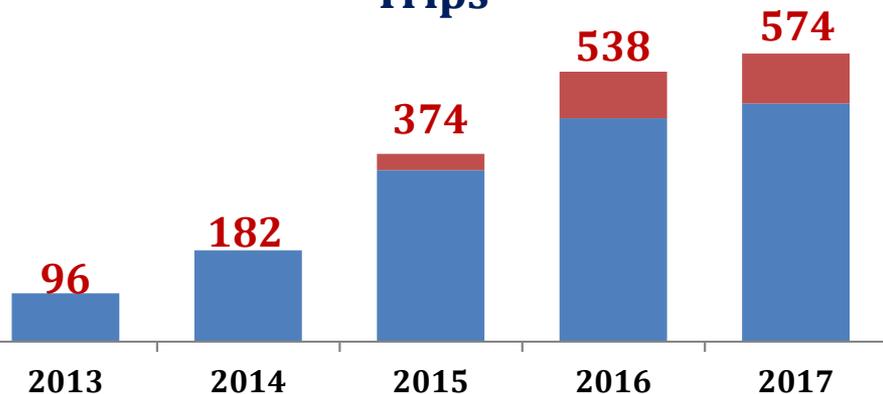


Emissions CO, g/kWt*h

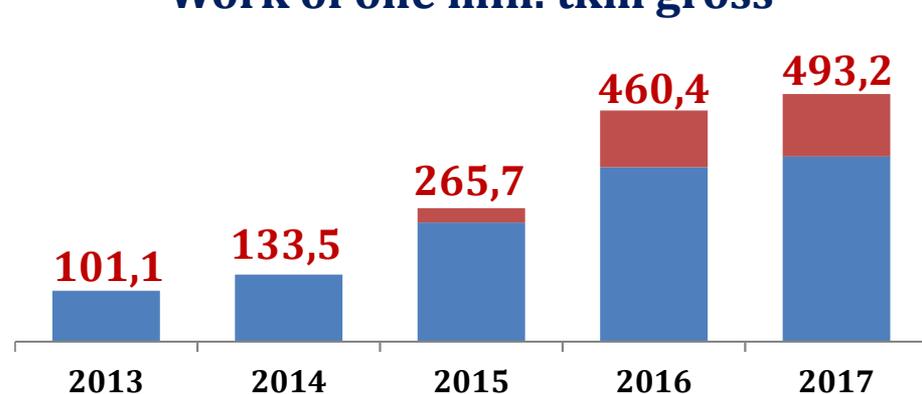


THE MAIN RESULTS OF OPERATION OF GAS TURBINE LOCOMOTIVES ON SVZHD FOR 2013 - 2017 y.y.

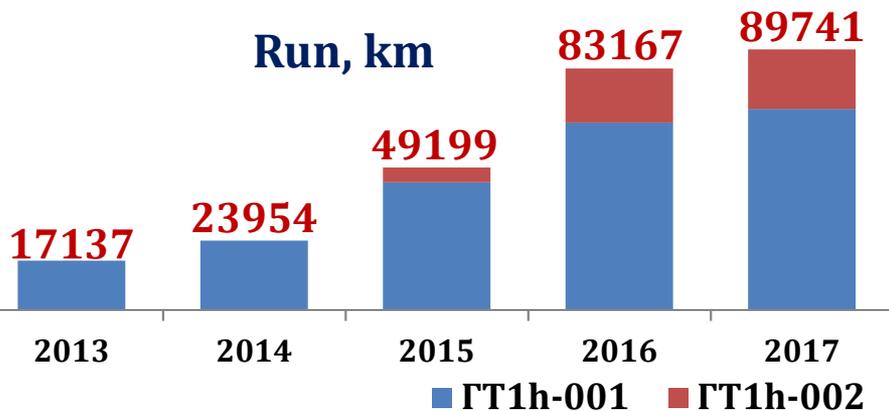
Trips



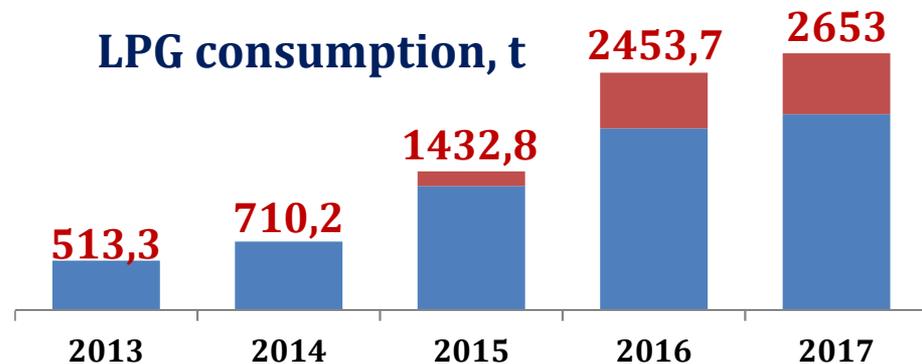
Work of one mln. tkm gross



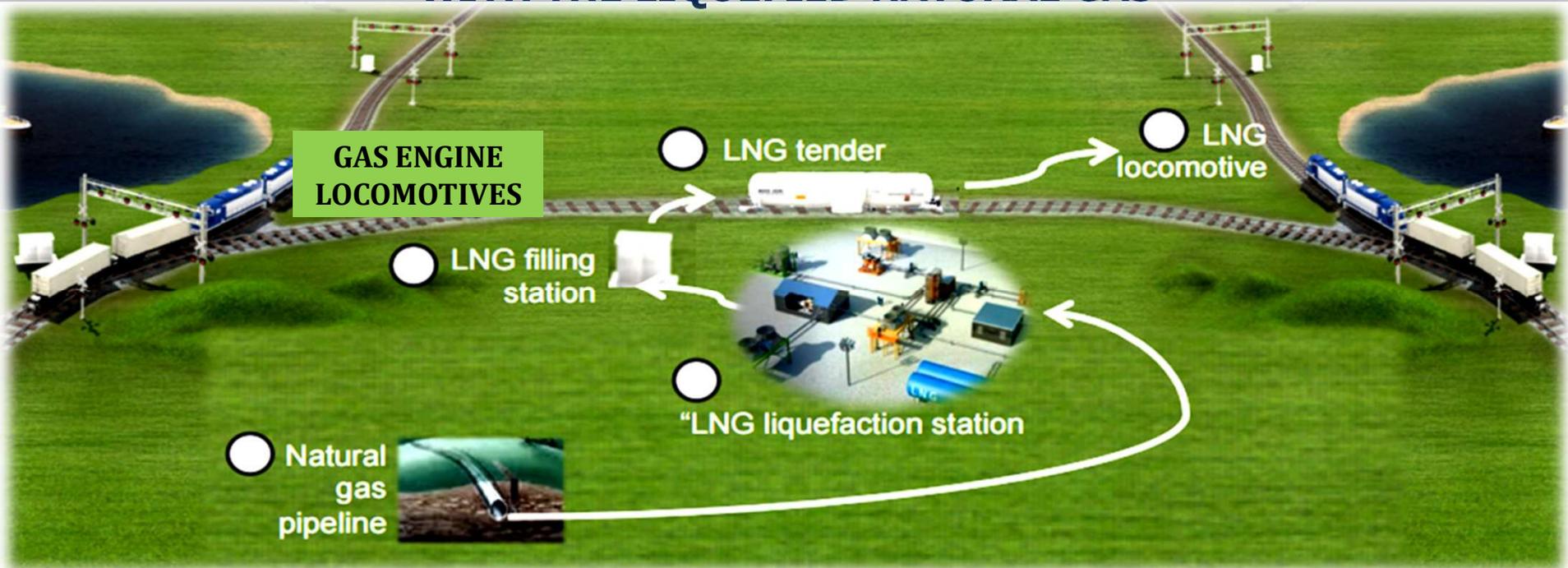
Run, km



LPG consumption, t



NECESSARY INFRASTRUCTURE OF PROVIDING GAS ENGINE LOCOMOTIVES WITH THE LIQUEFIED NATURAL GAS

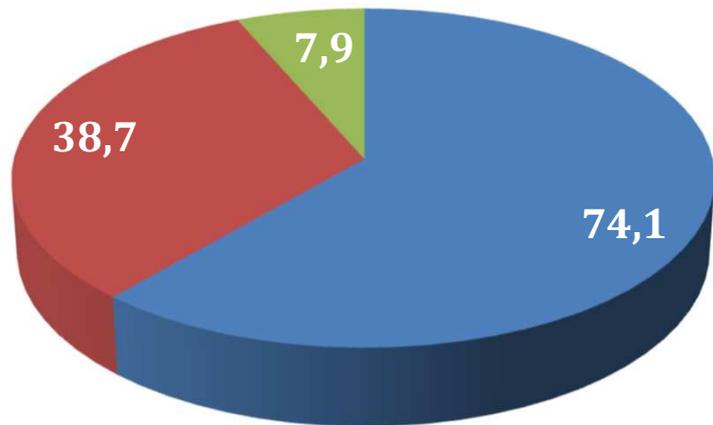


- **COMPLEXES ON LNG PRODUCTION (LNG KP)**
- **POINTS of EQUIPMENT of LNG (PE LNG) of gas engine locomotives (GML)**
- **LNG DELIVERY SYSTEMS from the producer to the consume**

COMPARATIVE ECONOMIC INDICATORS OF THE GAS TURBINE LOCOMOTIVE Gt1h-002 IN COMPARISON WITH THE LOCOMOTIVE 3TE116U ON THE SITE SURGUT-VOYNOVKA

3TE116U

**ANNUAL CHARGES – 120,6 million rubles
(1,773 million euros).**



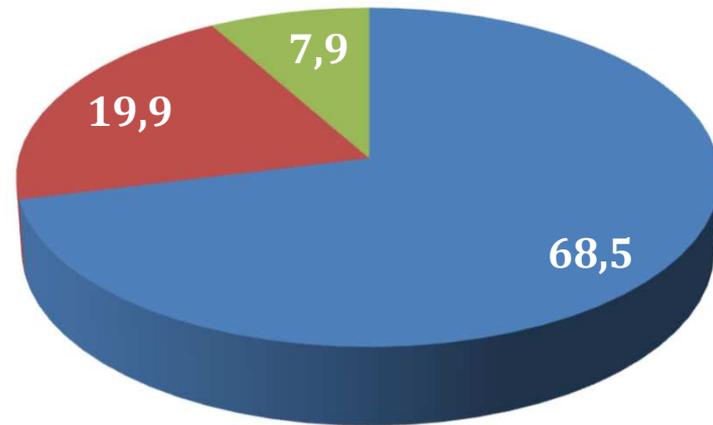
■ Fuel

■ Maintenance and repair

■ Compensation of locomotive crews

GT1h-002

**ANNUAL CHARGES – 96,3 million rubles
(1,416 million euros)**



ECONOMY of ANNUAL CHARGES ON TRANSPORTATIONS – 24,4 million rubles (0,359 million euros)

THE MAIN RESULTS OF TRIAL OPERATION OF TEM19-001 ON SVZHD IN 2014 – 7 MONTHS 2017. ON 31.07.2017



ТЭМ19-001	Indicator	2014	2015	2016	7 mon. 2017 г.	TOTAL 2015-2017
It is fulfilled changes	Change	38	164	350	195	747
It is fulfilled hours	hour	450,8	1967	4178	2 132	8 727,8
Run	iok.-km	2415	11678	14502	7 528	36 123
It is processed cars	cars	6444	28138	70117	36 561	141 260
The mass of the processed cars	T gross	279667	1235561	3148416	1 698 441	6 362 851
LNG consumption	т	23,180	51,034	89,345	48,4	211,9
Specific fuel consumption	kg/100 iok.-km	959,8	438,0	616,1	580,8	648,7

THANK YOU FOR ATTENTION

