



# 2019

Annual report

**ENVIRONMENTAL  
PROTECTION**

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\$430 m

allocated to investment projects with an environmental impact as part of Strategy 2022

\$78 m

allocated to investment projects with an environmental impact in 2019

97%

of water in production is recycled and reused

92%

of generated waste is reused (not including mining waste: overburden and tailings)

#### Awards

NLMK Lipetsk won the 16<sup>th</sup> High Social Performance Mining and Metallurgical Enterprise Industry Competition, finishing first in the *Environmental Activity and Resource Saving* category

The 'NLMK Lipetsk Eco-ideas' project won a competition as part of the *Environmental Culture. Peace and Harmony* international project in the *Environmental Culture in Industry and Energy* category

NLMK was awarded with a certificate for active participation in the *Green Spring' National Volunteer Clean-up Saturday* for taking the initiative and contributing to environmental protection

The Group received a gold medal at the Metal-Expo'2019 international industry awards for its briquetting plant project

For the third consecutive year NLMK Kaluga was a winner in the regional Eco Organization 2019 competition, taking first place among major corporations in the *Protecting Environmental Safety and Preserving a Healthy Environment* category

NLMK Kaluga was awarded with a Certificate of Merit for active participation in the High Social Performance Mining and Metallurgical Enterprise Industry Competition

# ENVIRONMENTAL PROTECTION

## MAJOR THEMES

- Water
- Discharge
- Biodiversity
- Atmospheric emissions
- Waste
- Supplier environmental assessment
- Environmental compliance

## KEY EVENTS IN 2019

- The Board of Directors approved a programme to reduce CO<sub>2</sub> emissions, including GHG reduction targets
- The Board of Directors established environmental protection as the key principle of NLMK Group's Sustainable Development Policy
- Drafting of NLMK Group's Policy for an Integrated Management System in Quality, Environmental Protection, Energy Efficiency, and Occupational Health and Safety
- Completion of 3 major projects to reduce emissions, with a reduction of over 5,000 tonnes

## UNITED NATIONS GLOBAL COMPACT PRINCIPLES

- **Principle 7:** Businesses should support a precautionary approach to environmental challenges.
- **Principle 8:** Businesses should undertake initiatives to promote greater environmental responsibility.
- **Principle 9:** Businesses should encourage the development and diffusion of environmentally friendly technologies.

## GLOBAL SUSTAINABLE DEVELOPMENT GOALS





# OUR APPROACH TO MANAGING ENVIRONMENTAL PROTECTION

The efficient use of natural resources and a responsible attitude towards the environment are important aspects of NLMK's work. The Group objectively assesses environmental risks and is committed to minimizing them. It allocates significant resources to various environmental programmes and the implementation of innovative technologies.

NLMK takes a comprehensive approach to environmental management by focusing on improving energy efficiency, reducing air emissions by upgrading equipment, reusing and processing waste, conserving water resources, and rehabilitating contaminated land.

## IMS POLICY<sup>1</sup>

We continue to analyse and enhance our policies and approaches to environmental protection management. In 2019, the Company updated the Group's Environmental Policy when drafting NLMK Group's Policy for an Integrated Management System in Quality, Environmental Protection, Energy Efficiency, Occupational Health and Safety (IMS Policy). The IMS Policy is the Group's fundamental document on environmental protection. It reflects the responsible and sound approach that NLMK takes to managing activities relating to environmental protection and safety. NLMK Group's management recognizes its responsibility for key aspects of the environmental impact on atmospheric air, water resources, biodiversity, climate change, and the social sphere from NLMK Group's operations and production processes. Our policy also confirms the commitment of the Group's companies to a number of principles, including adhering to Russian and international environmental protection standards, minimizing the risk of environmental impacts, and disclosing information about the environmental activity of the Group's companies.

### IMS Policy goals:

- Be a global leader in the quality of metal products and raw materials by continuously upgrading and expanding the product mix with the aim of increasing our customers' competitiveness
- Comply with the best industry practices in the sustainable use of material, technical, fuel, and energy resources as well as the occupational and environmental health and safety of production processes
- Be a global leader in adopting best practices to increase the energy efficiency of operations, and to achieve the minimum technically and economically feasible level of specific energy intensity and cost of production
- Ensure efficient production with zero accidents, emergencies, and near-misses through global excellence in operational health and safety practices and the continuous development and promotion of a safety culture among NLMK Group's employees and contractors
- Ensure the ecological and climate efficiency of operations, as well as respond to the changing environmental and climate conditions in balance with the social and economic needs

## ORGANIZATIONAL STRUCTURE

NLMK is committed to ensuring that all industrial processes are eco-efficient and conform to best global practices.

NLMK's management team is actively involved in the environmental management process:

- The Group's CEO and Board of Directors review environmental performance on an annual basis.
- The Strategic Planning Committee under the Board of Directors studies risks related to sustainable development, including those related to environment, atmospheric air, water resources, soil, biodiversity, and climate change (including greenhouse gas emissions).
- The Management Board's Investment Committee is directly involved in reviewing NLMK's Environmental Strategy and Environmental Programme. The Investment Committee includes vice presidents and directors of NLMK companies. It devotes special attention to the results of the annual environmental assessment, approves the investment budget for projects aimed at reducing environmental impacts, and oversees the investment budget for the Environmental Programme and its execution.
- The Environmental Department coordinates environmental management, including managing environmental risks and implementing advanced eco-friendly technologies.

Each of the Group's companies has an environmental protection expert who is responsible for, among other things, implementing systems that assess the maturity of environmental indicators and improve environmental management.

## TARGETS AND KEY PERFORMANCE INDICATORS

NLMK recognizes the importance of efficient environmental management. As part of its Environmental Programme 2022, which is reviewed and supplemented annually following a risk assessment, the Company has established the following targets:

- Minimizing the impact that the Group's Russian and international companies have on the environment, and complying with all applicable environmental standards and environmental risk management commitments
- Increasing the waste recycle rate at NLMK Group's Russian sites to 96%
- Reducing specific emissions at NLMK Group's Russian sites to 18.8 kg/t of steel

An important highlight in 2019 was the Board of Directors' approval of NLMK Group's CO<sub>2</sub> emissions reduction programme, which focuses on reducing specific CO<sub>2</sub> emissions across NLMK Group to 1.94 t/t of steel in 2023.

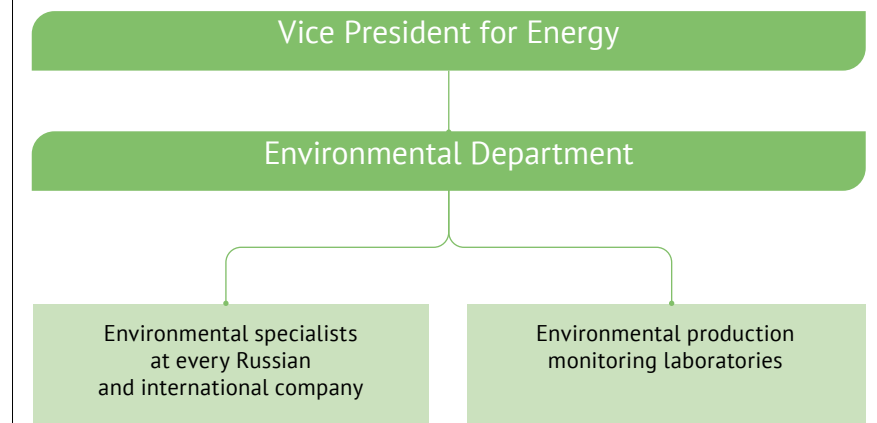
## CERTIFICATION

NLMK works continuously to systematize its environmental management operations in accordance with modern international standards. NLMK Group has an Environmental Management System in place, which enables it to identify and monitor environmental issues and the risks of its activities.

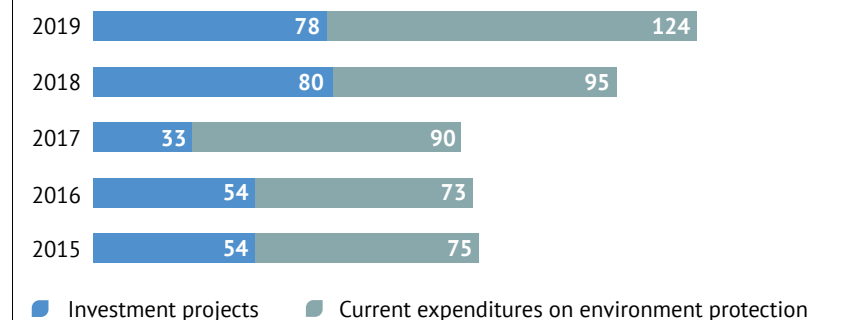
The ISO 14001:2015 standard has been implemented at 14 of the Group's facilities. The certified companies include: NLMK Lipetsk, VIZ-Steel, Altai-Koks, Dolomit, NLMK Kaluga, NLMK Metalware, NLMK Ural, Stagdok, Stoilensky, NLMK Verona, NLMK DanSteel, NLMK Clabecq, NLMK La Louvière, and NLMK Strasbourg.

In order to ensure a systematic approach to environmental management at the Group's facilities, supervision and recertification audits for compliance with ISO 14001:2015 are carried out on a regular basis.

## ORGANIZATIONAL ENVIRONMENTAL MANAGEMENT STRUCTURE



## NLMK GROUP SPENDING ON ENVIRONMENTAL PROTECTION, 2015–2019, \$ M



## INVESTMENT IN ENVIRONMENTAL PROTECTION

Each year NLMK Group commits significant resources to ensuring the accident-free operation of equipment and the implementation of investment projects that have an environmental impact. Spending on environmental management over the reporting period totalled more than \$200 m, an increase of 60% over the past five years.

NLMK Group maintains a high level of environmental investments, further increasing the share of nature conservation activities in current spending on environmental protection in 2019. In February 2019 the Company launched another operational effort to process technological and slag dump waste that has accumulated since Soviet times.

Since the commissioning of Blast Furnace No. 1 and up until the 1970s, the slag dump was used to collect and process blast furnace slag. In the early 1970s, a slag processing facility was built, and the slag dump was converted to collecting refractory shards, dust, and slag spilled from steelmaking shops. About 5 m t of materials were accumulated by 1990. No additional materials were accumulated at the slag dump after 1990. In post-Soviet times, all the waste from repairing key process units was fully recycled at the slag dump and used for reclamation and by specialized organizations. Recycling the slag dump will put roughly 20 hectares of useful area back into economic operations and allow for the sales of the accumulated process waste as building materials (different grades of crushed stone, scrap, etc.), and as raw materials for the Group's steelmaking operations.

<sup>1</sup> NLMK Group's Policy for an Integrated Management System in Quality, Environmental Protection, Energy Efficiency, and Occupational Health and Safety

MONITORING, CONTROL,  
AND COMPLIANCE

NLMK conducts internal audits to assess its environmental impact. It also has a production control system in place. Internal environmental audits involve the comprehensive monitoring of operations at the Group's companies, including treatment facility performance tests, measures to reduce the environmental impact of generated waste, and an environmental production plan to reduce specific air emissions.

The Group employs environmental production monitoring procedures with support from accredited laboratories in order to monitor the implementation of resolutions, prevent non-compliance with effluent discharge standards, and monitor sources of emissions and atmospheric quality at NLMK companies. These procedures have been agreed with state supervisory bodies and are regulated by legal documents. [GRI 303-2](#)

Supervisory bodies conduct regular annual checks, both scheduled and unscheduled, of the Group's companies to ensure they comply with Russian legislation as well as stakeholder expectations. A total of 48 checks were carried out by local environmental supervisory bodies in 2019. No significant fines or non-monetary sanctions were imposed on NLMK Group over the reporting year, and no legal proceedings were brought against the Group seeking compensation for damage to the environment or to third parties. [GRI 307-1](#)

The payments have been decreasing over the last five reporting years, which serves as a confirmation that the Group has reduced its negative impact on the environment.

PAYMENTS FOR NEGATIVE ENVIRONMENTAL IMPACT, \$ M

	2015	2016	2017	2018	2019
Entire Group <sup>1</sup>	4.0	2.4	2.6	2.3	1.7
Including payments for negative environmental impact of the Group's Russian sites	3.2	1.6	1.9	1.3	1.0

In 2019, the share of over-the-limit payments within the overall structure of payments by the Group's Russian sites for their negative environmental impact was slashed to 4% (from 21% in 2018).

NLMK also involves employees of all levels in the environmental monitoring process, by giving them an opportunity to register on an online system where they can note and propose solutions to issues associated with environmental safety and support for environmental welfare.

All employees are personally involved in responding to environmental issues

*In an effort to continuously improve environmental management, an internal environmental improvement system (IEIS) has been set up at ten of the Group's companies, including at all key production sites. This is the only project being implemented by steel producers in Russia to get assistance from the Group's employees to identify and prevent potential environmental incidents on a continual basis. Monitoring parameters are determined at each facility and its surrounding territory, and then monitored by employees. Once identified, potentially harmful situations are entered into a computer system. The individual responsible is assigned and a timeframe is established for eliminating the potential threat. All the Company's units are encouraged to eliminate all deficiencies and threats as quickly as possible.*

*The IEIS is an example of how environmental management processes can be improved and environmental safety safeguarded through the personal involvement of all staff members. In 2019, for the first time in its history, the Group presented awards to the best units and employees for the best annual IEIS results. Over 200 employees received financial rewards for their outstanding IEIS performance.*

TRAINING

As a company that is committed to improving the efficiency of its activities and reducing its environmental impact, NLMK Group works to boost the environmental protection skills and expertise of its employees.

NLMK devotes special attention to fostering a culture of environmental awareness among employees at its companies and in communities in the regions where it operates. A series of educational initiatives and materials, including the Key Rules for Protecting the Environment document and *Protecting the Environment* distance training course, has been developed for the benefit of all the Group's staff. Special environmental protection training consists of modules covering the use of dust and gas cleaning facilities and treatment equipment, how to eliminate situations which could lead to environmental issues, and waste handling. At least 10% of employees go through environmental training sessions and development courses every year.

Another form of such training are animated videos on environmental topics on the corporate portal. Two videos are currently available: *Environmental Initiatives* and *Handling Class I and Class II Hazardous Waste*. The Group uses this accessible and simple format to communicate environmental requirements to its employees.

In 2019, the Company developed and introduced the *Green Office* distant learning course, which promotes an eco-friendly lifestyle at home and at the workplace. This course was developed by the administrators of the *Green Office* community, which



has been active for several years within the Group, with the support of the HR development specialists. In this community, all the employees, who are committed to energy efficiency and environmental protection, share their advice, interesting web links, and discuss important topics concerning how one can use the Company's resources in the most sustainable manner and protect the environment. The *Green Office* programme aims to enhance the environmental commitment of the Group employees and teaches people about how they can contribute to reducing emissions into the air, water, and soil, and also reduce fuel costs in the process.

The Head of the Environmental Department's Industrial Safety Unit on animated videos developed in cooperation with the Group's PR Service:

*"Our objective is to create favourable conditions for involving our people in environmental protection. Such engagement motivates people, and being able to suggest an idea on improving the environmental situation creates a commitment to the overall cause of environmental protection. The Environmental Initiatives video facilitates this. As regards the waste management, complying with these requirements is of paramount importance, because it directly affects the condition of the nature around us."*

<sup>1</sup>. For the Group's international companies, costs of procuring permits are taken as payments for negative environmental impact





SUPPLIER  
ENVIRONMENTAL  
ASSESSMENT

A qualifications procedure for all suppliers has been introduced within NLMK Group, which covers compliance with environmental standards. The environmental criteria for assessing suppliers are set out in NLMK Group's regulatory documents.

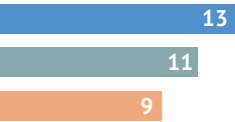
One of the key environmental criteria that the Group employs in assessing suppliers is compliance with Russian environmental legislation. All providers of raw materials, supplies, and equipment to NLMK Group as well as suppliers of services (contractors), undergo assessments for compliance with Russian environmental legislation. Contractors who have been found not to meet the established criteria following the qualification and audit procedures are not permitted to supply raw materials, supplies, or equipment or to provide services to NLMK Group companies. In 2018–2019, 100% of new service providers were screened using the environmental criteria. For contractors, assessments are based on an internal document titled Standard Environmental Protection Requirements for Contractors. **GRI 308-1** In 2019, the Company updated the Agreement on occupational health, industrial and fire safety, work performance, environmental protection as well as onsite and access control for relations with its counterparties,

SUPPLIERS SUBJECT TO MEASURES TO IMPROVE ENVIRONMENTAL COMPLIANCE FOLLOWING AUDITS (% OF TOTAL AUDITS CONDUCTED)  
**GRI 308-2**

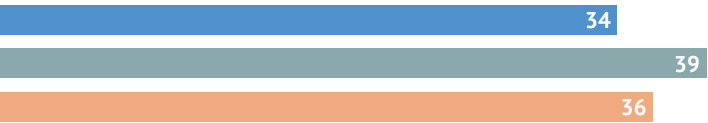
Indicator	2017	2018	2019
Number of suppliers with environmental compliance improvement measures	69	80	41

SUPPLIERS OF FEEDSTOCK, MATERIALS, AND EQUIPMENT TO NLMK GROUP SCREENED USING ENVIRONMENTAL CRITERIA DURING AUDITS **GRI 308-1**

Number of new suppliers



Number of supplier audits



■ 2019 ■ 2018 ■ 2017

which will also enable the Group's enterprises to deal efficiently with suppliers and contractors on matters concerning environmental protection and to effectively prevent environmental violations from their side.

Compliance with Russian environmental legislation by qualified suppliers is assessed at NLMK Group through supplier audits, which seek to confirm that supplier activities comply with the environmental criteria applied by NLMK Group. These audits also confirm that the environmental impact of suppliers is not significant enough to indicate non-compliance – this would result in the decision to break off relations with the contractor. In addition, all products supplied to NLMK companies come with safety data sheets that regulate potential hazards associated with the handling of products and prescribe the respective necessary precautions.

The Group works with its suppliers during the audits to eliminate environmental deficiencies. In particular, in 2019, based on the audit results for one of its lubricants suppliers, the Company prevented the risk of soil pollution with petroleum products by implementing measures to reinforce the storage areas. Such continuous efforts helped reduce the number of improvement activities among suppliers.

MEMBERSHIP  
AND PARTICIPATION  
IN ORGANIZATIONS

NLMK works with Russian and international associations to establish an effective dialogue on issues surrounding the sustainable use of natural resources. In particular, NLMK Group is a member of the World Steel Association (WSA), which represents over 170 steel producers across the globe. NLMK is a member of WSA expert groups on the environment, sustainable development and climate, and participates in the Association's events and expert meetings. As part of its collaboration with the WSA, the Group collects and submits data on sustainable development indicators on an annual basis. In 2018, NLMK Group signed the Sustainable Development Charter, which spells out the commitment of WSA members to treating steel as a key element

in a sustainable world and their willingness to be guided by environmental, social, and economic sustainability principles.

NLMK Group is also a member of the Russian Steel industry association and takes active part in the work of its environmental committee, which reviews various environmental aspects of steelmaking operations and environmental regulation issues. NLMK is a member of the Committee on Ecology and Environment Management of the Russian Union of Industrialists and Entrepreneurs, the main platform for consolidating the Russian business community's position on various environmental aspects.

NLMK Europe is a member of the European Steel Association (EUROFER), which discusses environmental developments in Europe and is particularly active in the EU carbon regulation activities. NLMK Group is committed to the sustainable steelmaking principles promoted by the EUROFER.

As of the end of 2019, NLMK had consolidated its position among the top ten most environmentally responsible Russian mining and steel companies according to World Wildlife Fund (WWF) data. The main purpose of the report published by WWF Russia was to rank Russian companies according to their transparency in matters of environmental responsibility. The research examines the activities of 40 major companies and has been published since 2015, with the support of the UN Development Programme, the Global Environment Facility, and the Russian Ministry of Natural Resources and the Environment.

In 2019, NLMK Group, the Russian Ministry of Natural Resources and the Environment, the Federal Supervisory Natural Resources Management Service (Rosprirodnadzor), and the Administration of the Lipetsk Region have signed a four-way Cooperation Agreement as part of a comprehensive plan to reduce gross air emissions in Lipetsk. Total environmental investment will amount to RUB 21 bn, slashing 8,100 tonnes of gross air emissions by 2024. The Agreement forms part of the Federal Clean Air Project implemented under the Ecology National Project and confirms the Company's commitment to the nationwide effort on environmental protection.

NLMK Group also cooperates with other steelmaking companies in exchanging best practices and promoting sustainability principles, including those related to greenhouse gas emissions. In particular, NLMK Group's office in Moscow hosted a workshop on the Responsible Steel standard – the steel industry's first certification initiative that will be used by steelmaking companies in the future to prove the compliance of their products with global sustainable development standards, including those related to CO<sub>2</sub> emissions. The workshop was attended by over 10 key representatives of the Russian industry companies.

# WATER RESOURCES

GRI 303-1, 303-2

Water is an essential resource for NLMK Group's industrial processes. The Group is committed to reducing the volume of water that it consumes, and devotes considerable efforts to lowering its water intake volumes in favour of reusing water. The Group's companies are likewise focused on reducing the volume and improving the quality of wastewater produced, which is in line with the IMS Policy of NLMK Group.

## WATER WITHDRAWAL

GRI 303-1, 303-2

NLMK companies withdraw a small proportion of their water from external sources for production and drinking purposes (less than 4% of the Group's total water consumption). Maintaining the same low level of freshwater intake as production volumes grow is an important objective of NLMK Group. For industrial water supplies, the companies use water from surface water bodies, underground sources, and rainfall. NLMK Group companies do not use wastewater from other organizations or water from municipal supply systems for industrial processes. Stoilensky, Stagdok, Dolomit, NLMK Metalware, Vtorchermet NLMK, NLMK Verona, and NLMK Strasbourg do not withdraw water from surface water bodies. The Group's companies do not withdraw water from wetlands included on the Ramsar List of Wetlands of International Importance or from water bodies located within environmental conservation sites.

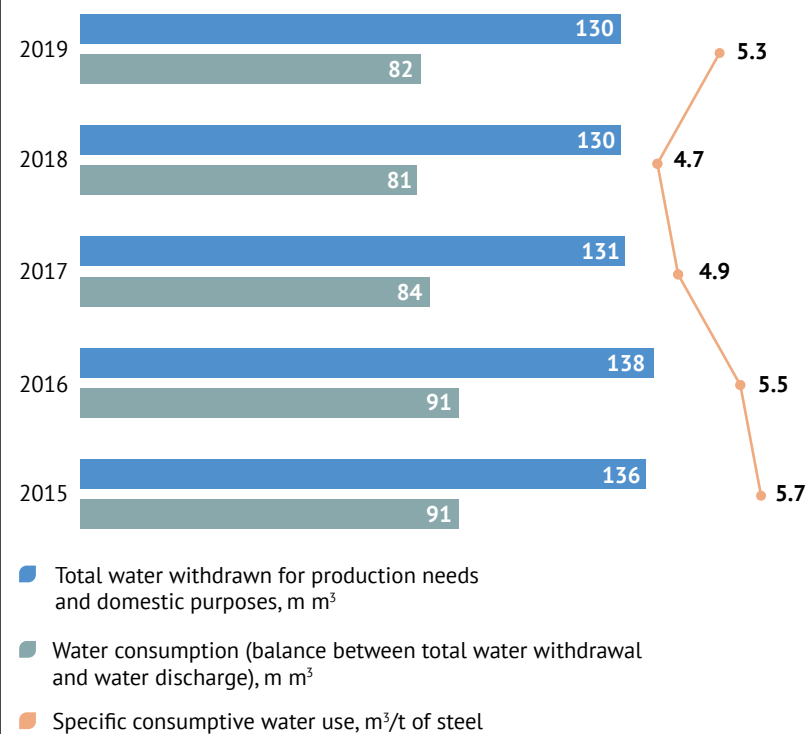
The water bodies that supply NLMK companies are assessed as being not particularly vulnerable given their size, role, or lack of status as being rare, threatened, or endangered.

The Group's companies withdraw water in accordance with current permits and have no significant impact on the water sources in question. Water withdrawal by NLMK Group companies does not exceed 2.5% of the average annual water flow volume. **GRI 303-5**

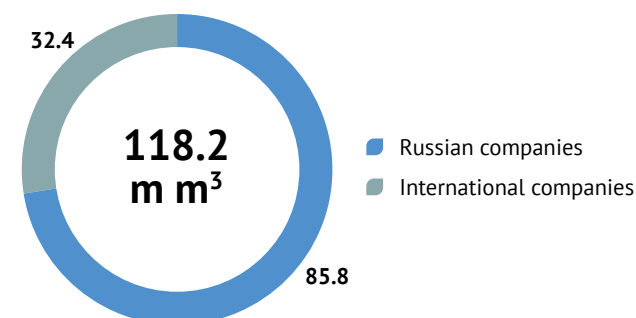
In 2019, specific consumptive water use per tonne of steel increased because the main consumers of fresh water – power generation facilities – increased their output (leading to higher water consumption), while major overhauls of steelmaking units resulted in a reduction in steel production, which, in turn, led to an increase in this specific indicator.

### TOTAL VOLUME OF WATER CONSUMED BY NLMK GROUP, 2015–2019

GRI 303-3, 303-5



### TOTAL VOLUME OF WATER WITHDRAWN FOR NLMK GROUP PRODUCTION NEEDS BY REGION, 2019, M M³ **GRI 303-3**



### TOTAL VOLUME OF WATER WITHDRAWN FOR NLMK GROUP PRODUCTION NEEDS BY SOURCE, 2015–2019, M M³ **GRI 303-3**

Source type	2015	2016	2017	2018	2019
Surface water	63.2	61.5	60.9	60.1	60.9
Ground water	59.4	62.6	58.1	58.0	57.1
Rainwater collected and stored by organization	0.2	0.1	0.1	0.1	0.1
Group total	122.7	124.3	119.1	118.2	118.2

Over the last 45 years (since 1974), the annual withdrawal of fresh water from the Voronezh River by the Group's core site in Lipetsk has been reduced by over nine times down to 21 m³/year (from the level of 194 m³/year in 1979 when production output was merely 9 m t).

## RECYCLED AND REUSED WATER

In order to reduce their negative impact on water resources, the majority of NLMK Group's companies are equipped with water recycling systems. This also mitigates the Group's water-related risks.

Water recycling solutions have been put in place at NLMK Lipetsk, Altai-Koks, VIZ-Steel, NLMK Kaluga, Stoilensky, NLMK Ural, NLMK Metalware, NLMK DanSteel, NLMK Indiana, NLMK Pennsylvania, NLMK Sharon Coating, NLMK Verona, NLMK Clabecq, and NLMK La Louvière. These solutions include both local systems for individual facilities and entirely self-contained subsidiary-wide systems. This helps to reduce water withdrawal and effluent discharge into surface water bodies. The share of recycled water supply at NLMK Group remains at a consistently high level. The goal is to maintain a recycled water supply of at least 96% amid increasing production output.

The figures provided for recycled water supply show the additional water consumption by NLMK Group that would have occurred if no water recycling had been in place at its enterprises.

### WATER WITHDRAWAL (CONSUMPTION FROM WATER UTILITIES) FOR POTABLE WATER SUPPLY AT NLMK GROUP COMPANIES, 2015–2019, M M³ **GRI 303-3**



### SHARE OF RECYCLED WATER IN NLMK GROUP'S TOTAL WATER CONSUMPTION, %



### VOLUME OF WATER RECYCLED AT NLMK GROUP COMPANIES, M M³



The regions where the Group operates offer a high availability of water resources. The Group has no operations in water-stressed areas.

Only one location, namely the Belgorod Region where Stoilensky is situated, is exposed to a local water shortage as related to potable and household water supply in some areas of the region during dry years. This local water shortage



risk is addressed in the federal target programme *Development of Water Management in the Russian Federation*, which provides for the construction of new water reservoirs and renovations of engineering structures at existing ones.

Recognizing the importance of preserving the water resources in light of shortage risks, Stoilensky is implementing projects to cut down potable water consumption and taking action to protect water resources from the harmful effects of its operations, including though better safety and the reliability of hydraulic structures. A dedicated certified laboratory regularly samples and checks the quality of water withdrawn, sewerage, and water bodies in the area of potential impact.

DISCHARGE

Monitoring of discharge into water bodies at all sites is an important environmental aspect of NLMK Group operations.

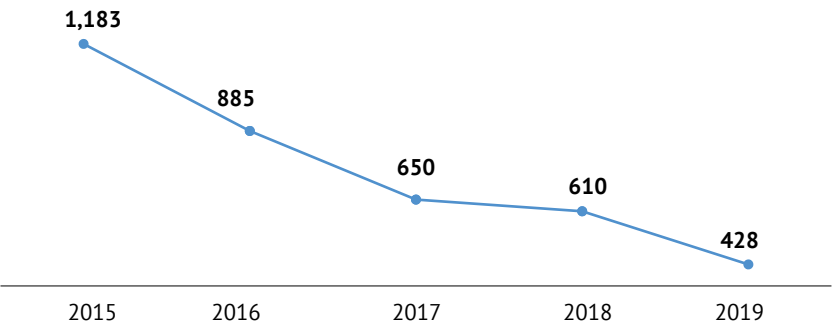
The Group's international companies mainly discharge water that is used for cooling equipment in once-through systems. This water does not get polluted in use and is discharged into water bodies in the same conditions as it was withdrawn, without disrupting the natural state of the environment.

In 2019, actions were taken at the main site in Lipetsk to reduce discharges of household wastewater into the Voronezh River.

Over the last five years, water discharge from NLMK Lipetsk decreased by 2.8 m m<sup>3</sup> (–24%), while the total mass of discharged pollutants decreased by 3,200 t (–24%).

In 2019, NLMK Ural shut down two of its three wastewater discharge sites. As a result, the volume of water discharge decreased in 2019 versus 2018 by 0.1 m m<sup>3</sup> (–17%), while the discharge of pollutants declined by 100 t (–73%). The total discharge reduction over the last five years amounted to 0.6 m m<sup>3</sup> (–51%), and the reduction of discharged pollutants by weight amounted to 200 t (–89%).

POTABLE AND HOUSEHOLD WATER CONSUMPTION AT STOILENSKY, K M<sup>3</sup>



Swan Lake Environmental Park – a natural indicator of NLMK’s commitment to a clean environment and biodiversity

Swan Lake Environmental Park was created by NLMK employees in 1978. It is the only bioindicator in Russia and the former Soviet Union that is situated on the territory of an industrial site. The lake is filled with process water from the Lipetsk site that has undergone treatment following its use in production. The environmental park occupies more than 5 hectares of land situated between the BOF shops of the Lipetsk site. It is home to some 500 birds of over 40 species, including 20 rare species. The lake is also inhabited by fish (common and bighead carps), which helps ensure that the waterfowl have a natural diet. Many bird species can only live in natural or near-wildlife conditions. The quality of the environment in the park allows these picky and demanding birds to enjoy long lives and reproduce regularly. In 2019, half of the species produced offspring, including three species listed in the Red Book of Russia: the bar-headed goose, red-crowned crane, and demoiselle crane. A new spawn of ostriches is expected too. Swan Lake works closely with leading Russian zoos and nature reserves to grow and replenish the animal populations.

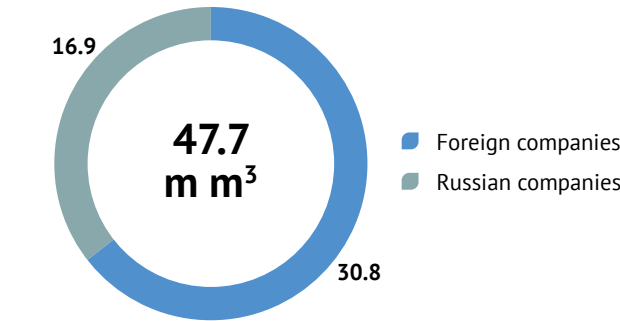
The park’s premises underwent improvements and renovations in 2019. Flowerbeds were installed over an area of 100 m in length. More than 230 willows and lindens were planted around the park, as well as more than 400 shrubs of juniper, spirea, rhododendron and panicled hydrangea, 50 shrubs of beach rose, 100 bushes of silvergrass, and 50 bushes of stefanandra. A pavilion for feeding birds was built at the park by NLMK’s own repair service. Amenities for the birds were not left out either, floating pontoons were installed along the shoreline. Older, derelict houses were replaced by block-house structures with soft roofing. Pontoons with on-top cabins were already floating on the lake in autumn. This was done to give the birds a chance to get used to the new facilities so that they can readily occupy them early in spring.

In 2019, Swan Lake Park was visited by over 5,000 people.

Each company makes use of water purification and treatment technologies that ensure the quality of wastewater as well as water used for industrial and domestic purposes meets the standards set by applicable regulations. The appropriate methods are applied according to the type of wastewater in question (mechanical purification, oil/water interceptors, biological purification, decontamination). All discharged materials have mineral content of less than 1,000 mg/L. No untreated discharges are made into water bodies.

The Group has been pursuing the Steel Tree initiative for several years now. In 2019, a new project called Environmental Patrol was launched. Led by Mariya Trukhacheva, volunteers went down the Voronezh River in kayaks and cleaned up municipal waste along 10 km of the river and on over 500 m<sup>2</sup> of adjacent lands. Waste entangled in aquatic vegetation was sent for treatment.

TOTAL VOLUME OF DISCHARGE BY NLMK GROUP, INCLUDING RUSSIAN AND INTERNATIONAL COMPANIES, 2019, M M<sup>3</sup>



TOTAL VOLUME OF DISCHARGE BY RECEIVING WATER BODY<sup>1</sup>, M M<sup>3</sup>

Indicator	2015	2016	2017	2018	2019
Total volume of water discharge for NLMK Group	45.2	46.5	47.3	49.0	47.7
Water discharge as % from total water supply	1	1	1	1	1
into surface water bodies, including rivers, lakes, reservoirs, and canals	43.2	44.4	45.2	46.8	45.7
including into seas and oceans	0.2	0.2	0.2	0.3	0.3
transferred to third-party organizations for treatment	2.0	2.1	2.1	2.1	2.0

ACTIONS TAKEN AT NLMK LIPETSK TO REDUCE WASTEWATER DISCHARGES INTO THE VORONEZH RIVER

No.	Description of activities	Environmental improvement at the point of discharge at NLMK treatment facilities on the Voronezh River
1	Retrofitting of local treatment facilities	In 2019, as compared with 2018, wastewater discharge was reduced by 1.5 m m <sup>3</sup> (–15%)
2	Reuse of water from drawdown sites of the Refractory Shop in the water recycling system instead of withdrawal of river water	
3	Optimization and redistribution of water flows in the process water supply system	
4	Elimination of discharges into the household sewage system at seven subdivisions of the site	
5	Elimination of rainwater discharge from the site premises into the household sewerage system by resealing wells	

<sup>1</sup> Data for the previous year was corrected after the 2018 report had been published due to a revision of Stoilensky’s indicators.



# AIR EMISSIONS

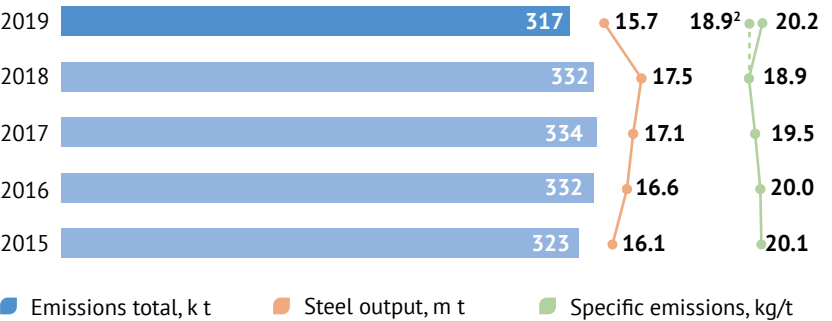
NLMK Group devotes considerable efforts to reducing its air emissions and has set a target of reducing specific air emissions from 19.8 kg/t of steel in 2018 to 18.8 kg/t of steel by 2023.

In order to attain this target, the Environmental Programme 2022 envisages over 30 investment projects that aim to reduce the impact on the atmosphere. When upgrading its purification equipment, NLMK seeks to integrate and utilize best available technologies (BAT). For emission reduction projects implemented in 2019, see the table below.

## Lipetsk – one of Russia’s cleanest steelmaking centres

Since 2014 the city of Lipetsk, which is home to NLMK Group’s largest site, has been officially recognized as the ‘cleanest’ steelmaking city in Russia, according to data from Russia’s Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet). Thanks to environmental protection measures implemented at the Lipetsk site, the Integrated Air Pollution Index (IAP)<sup>1</sup> in the city of Lipetsk fell by a factor of almost 10 between 2000 and 2019.

SPECIFIC VOLUME OF AIR EMISSIONS BY NLMK GROUP IN 2015–2019<sup>2</sup>



## ENVIRONMENTAL PROGRAMME EMISSION REDUCTION PROJECTS IMPLEMENTED IN 2019

Site	Measure	Effect
NLMK Lipetsk	Revamp of de-dusting systems, replacement of hot-blast stoves and re-tooling of slag granulation plants during overhauls of Blast Furnace No. 6	<ul style="list-style-type: none"><li>Reduction of H<sub>2</sub>S, SO<sub>2</sub>, dust and CO</li><li>Total effect – 4,806 tpa</li></ul>
	Reconstruction of off-gas ducts at BOF No. 2 and construction of secondary emission treatment systems at BOF Shop No. 2	<ul style="list-style-type: none"><li>Reduction of dust and CO</li><li>Total effect – 500 tpa</li></ul>
	Revamp of the de-dusting unit (ATU-24) in the refractory shop	<ul style="list-style-type: none"><li>Over 90% reduction in dust emissions at the facility</li><li>Performance of de-dusting system up by 20% to 240,000 m<sup>3</sup>/h</li><li>Total effect – 100 tpa</li></ul>
	Revamp of by-product collection facilities, including merging of coke gas flows from coke batteries	<ul style="list-style-type: none"><li>Reduction of phenol, H<sub>2</sub>S and other specific substances.</li><li>Total effect – 20 tpa</li></ul>
NLMK Indiana	Installation of dust catchers for truck unloading	<ul style="list-style-type: none"><li>Elimination of visible emissions during loading and unloading</li></ul>

In 2019, specific emissions increased compared with 2018, while gross emissions fell by only 4.3% and steel production was the lowest in five years (~10%) amid major overhauls of steelmaking units at the Lipetsk site. This was driven by sources at the site that generate emissions independently of steel production output (power generation, mining, rolling lines, and upstream operations at the Lipetsk site). The other driver was the transition of NLMK Lipetsk to full captive supply of pellets from Stoilensky, which increased emissions at the mining plant compared with 2018. Given the steel production plan as per Strategy 2022 and the implementation of upcoming emission reduction measures, there is no risk of the failure to meet the specific emission target (18.8 kg/t of steel in 2023).

## NLMK launches green coke and chemical by-product recovery complex

NLMK Lipetsk, the Group’s flagship production site, launched a recovery complex to capture and process chemical by-products from coke and chemical operations. The project makes it possible to increase the production of raw materials for the chemical industry and the agricultural sector, and halves the shop’s air emissions. The new complex was built with the use of best available technologies (BAT).

The new equipment and sustainable technologies will allow for the recovery of 100% of ammonium sulphate dust and significantly reduce the shop’s emissions: hydrogen sulphide by 31%, phenol by 71%, ammonia by 79%, and naphthalene by 23%.

The company’s total investment in the project amounted to RUB 4.6 bn.

## VOLUME OF SIGNIFICANT AIR EMISSIONS BY NLMK GROUP BY SUBSTANCE TYPE, KT GRI 305-7

Indicator	2015	2016	2017	2018	2019
Total	323.4	332.4	333.8	331.5	317.0
NOx emissions	22.0	24.8	27.1	27.2	26.2
per unit of production, kg/t	1.4	1.5	1.6	1.6	1.7
SO <sub>2</sub> emissions	27.7	28.9	31.8	31.7	29.5
per unit of production, kg/t	1.7	1.7	1.9	1.8	1.9
Particulate matter emissions	25.5	25.2	25.7	24.4	22.5
per unit of production, kg/t	1.6	1.5	1.5	1.4	1.4
CO emissions	244.9	249.6	245.9	244.8	235.3
per unit of production, kg/t	15.3	15.0	14.4	14.0	15.0
Volatile organic compounds	2.5	2.6	2.6	2.7	2.8
Hazard class 1 substances, t	2.0	1.0	1.0	1.0	1.0

<sup>1</sup>. The IAPI indicator, which was developed and calculated by Roshydromet, is used by the Russian Ministry of Natural Resources and the Environment to conduct scientific assessments of air pollution in Russian cities.  
<sup>2</sup>. Specific emissions without the impact of temporary decline in production output at NLMK Lipetsk amid overhauls of blast furnace and steelmaking operations.

# GREENHOUSE GAS EMISSIONS

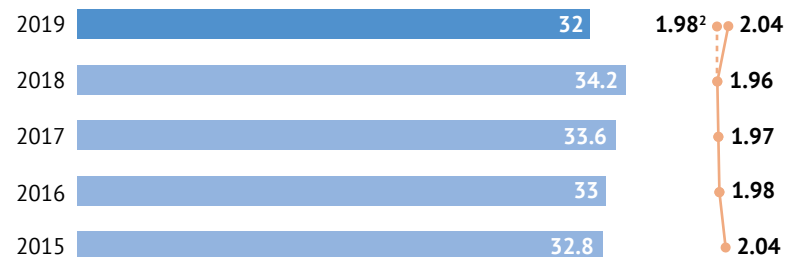
NLMK Group is aware of the importance of climate change prevention and the transition to a low-carbon economy, and is committed to reducing greenhouse gas emissions by implementing measures to reduce the specific consumption of non-renewable fuels and to boost energy efficiency. The Group carries out regular monitoring, analysis, and evaluation of climate-related regulatory, reputational, and market risks. The most significant risk, which the Group focuses on and monitors closely, is the introduction of a carbon border tax / emission allowances for products imported into the European Union.

The increase in specific CO<sub>2</sub> emissions in 2019 versus 2018 is due to an increase in captive power generation amid lower steel production and the remaining constant CO<sub>2</sub> emissions generated by non-steel producing assets.

During the reporting year, two of NLMK Group's Russian companies, namely Altai-Koks and Dolomit, took part

## SPECIFIC EMISSIONS OF CO<sub>2</sub> BY NLMK GROUP, 2015–2019, T / T OF STEEL<sup>1</sup>

GRI 305-4



■ Total emissions of CO<sub>2</sub>, m t ■ Specific emissions of CO<sub>2</sub>, t/t of steel

in the Climate and Responsibility 2019 Russian national competition and were nominated in the categories *Best Russian organization in GHG emission reduction among organizations emitting over 150,000 t of CO<sub>2</sub> equivalent per year* and *...emitting less than 150,000 t of CO<sub>2</sub> equivalent per year*.

In 2019, NLMK Group developed its Greenhouse Gas Emissions Reduction Programme. The objective of this Programme is to reduce CO<sub>2</sub> emissions (Scope 1 and 2) to 1.94 t/t of steel by 2023 versus 1.96 t/t of steel in 2018. To this end, the Group put together a set of measures, some of which were already completed in 2019. Their effect will be captured in 2020. The main effect will be achieved by the Strategy 2022 projects that are developing captive power generation. This includes a new power plant to recover secondary fuel gases at the Lipetsk site, co-generation units at NLMK Ural, and a reduction in coke consumption as the iron content is increased in the ore that goes into charge materials. The Group will continue looking into opportunities to further slash CO<sub>2</sub> emissions beyond those stated in the Programme.

## DIRECT AND INDIRECT ENERGY EMISSIONS OF CO<sub>2</sub> (SCOPE 1 AND 2), 2015–2019, T CO<sub>2</sub> EQUIVALENT<sup>3</sup>

GRI 305-1, 305-2

Indicator	2015	2016	2017	2018	2019
Direct CO <sub>2</sub> emissions (Scope 1), m t	29.20	29.20	29.60	30.20	28.40
Specific direct CO <sub>2</sub> emissions (Scope 1), t/t of steel	1.82	1.76	1.73	1.73	1.81
Indirect energy CO <sub>2</sub> emissions (Scope 2), m t	3.60	3.80	4.00	4.00	3.60
Specific indirect energy CO <sub>2</sub> emissions (Scope 2), t/t of steel	0.22	0.23	0.23	0.23	0.23
<b>Total CO<sub>2</sub> emissions (Scope 1 and 2), m t</b>	<b>32.80</b>	<b>33.00</b>	<b>33.60</b>	<b>34.20</b>	<b>32.00</b>
<b>Specific CO<sub>2</sub> emissions (Scope 1 and 2), t/t of steel</b>	<b>2.04</b>	<b>1.98</b>	<b>1.97</b>	<b>1.96</b>	<b>2.04 (1.98<sup>2</sup>)</b>
<b>CO<sub>2</sub> emissions, kg/\$ revenues</b>	<b>4.09</b>	<b>4.32</b>	<b>3.34</b>	<b>2.84</b>	<b>3.03</b>

<sup>1</sup> Includes revised data from previous periods as additional flows of carbon-containing materials were accounted for at the Lipetsk site.

<sup>2</sup> Specific emissions without the impact of a temporary decline in production output.

<sup>3</sup> NLMK Group's CO<sub>2</sub> emissions were calculated based on total emissions at the Group's sites. Emissions at the Group's sites are calculated on the basis of applicable national (regional) methodologies for determining emissions and indirect energy emission factors (for different countries or regions of Russia).

# WASTE HANDLING AND SOUND USE OF NATURAL RESOURCES

## WASTE MANAGEMENT

NLMK Group's waste-handling operations are orientated towards key modern steelmaking trends: minimizing waste generation, disposing of waste safely, and increasing the proportion of waste that is processed and reused. For example, a priority of the Environmental Programme 2022 is to increase waste utilization at NLMK Group to 96% (not including such mining waste as overburden and beneficiation tailings).

NLMK Group utilizes some of the waste generated at its sites in the course of its own activities, and transfers some for reuse by specialized organizations that hold relevant licences.

The potential environmental impact is minimized through compliance with safe waste-handling standards and by implementing corresponding measures.

## NLMK Group launches new by-product fuelled facility

*NLMK Group launched a facility to manufacture metallurgical briquettes for use in blast furnace operations. The project allows for the production of feedstock from blast furnace by-products, and the recycling of previously accumulated waste. The plant uses processes that NLMK developed in-house. The new production facility has total capacity of 700,000 t of briquettes per year.*

*Briquettes are produced from Fe-containing waste generated during blast furnace gas treatment as well as coke and coal dust recovery.*

*Investment in the project totalled RUB 3 bn. The project created about 200 new jobs at NLMK.*

*This project will help achieve the Group's target of increasing waste utilization to 96% (not including such mining waste as overburden and beneficiation tailings).*

In 2019, total waste generation increased by 14% (by 7.1 m t) due to increased mining output at Stoilensky and the implementation of major investment projects at the Lipetsk site, which involved significant amounts of construction waste. The volume of recycled waste increased by 0.6 m t, while the volume of waste disposed at third-party landfills remained flat due to actions taken to increase the share of recycled waste as well as the implementation of waste sorting and separation and separation from previously disposed waste and recycled waste (paper, plastic, wood).

## TOTAL WASTE GENERATED BY NLMK GROUP, 2015–2019, M T

GRI 306-2

Indicator	2015	2016	2017	2018	2019
Waste generation	63.5	60.0	57.3	49.9	57.0
Mining waste	58.1	55.3	53.9	46.6	53.7
Waste generation, excluding mining waste	5.4	4.7	3.4	3.4	3.4
Volume of recycled (processed and neutralized) waste (excluding mining waste)	5.2	4.4	3.0	3.0	3.1
Waste recycling, excluding mining waste, %	95.7	93.6	86.7	89.3	92.0



A total of 99.7% of the waste generated by NLMK Group is non-hazardous, with 97.2% of the waste generated by the Group's Russian sites classified as Hazard Class 5 (non-hazardous). This waste category has virtually no impact on ecosystems and requires no special handling measures, including licensing.

## TAILINGS DAMS AND HYDRAULIC ENGINEERING STRUCTURES

The organizational structure of NLMK Group includes dedicated services and units responsible for the safety of hydraulic structures.

The Stoilenskoye iron ore deposit is mined using the open-pit method. The sole tailings dam at NLMK was built in 1984, and the tailings dams at Stoilensky are being built on the upstream slope. Throughout its operation, no environmental incidents related to the tailings dam systems and structures have been recorded.

The safe operation of the tailings dam is ensured by means of a number of internal and independent inspections. Among other things, during the inspections:

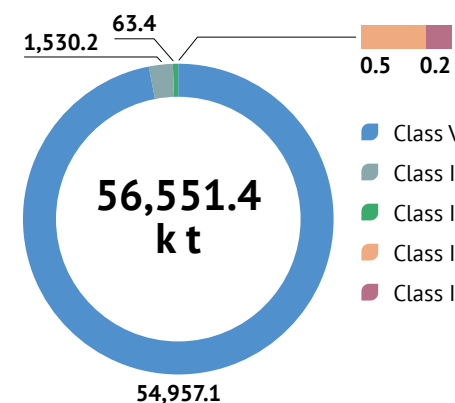
- Water level is checked at least twice a day
- Visual inspection of engineering structures is performed at least once a day
- Quality control of tailings is performed at least once every quarter
- Water filtration is checked at the dams at least once a month
- The facility's safety is checked weekly by inspectors from the Federal

## NLMK Group uses innovative technology for road in Lipetsk Region

*NLMK Lipetsk, NLMK Group's flagship production site, completed the construction of a road in the Lipetsk Region village of Teploye by employing a new soil stabilization technology that uses steel slag. This road will not need repairs for at least three years, and has a price tag three times lower than that of regular asphalt and concrete roads.*

*In July 2019, NLMK Group hosted guests from the World Steel Association at a Conference on Industrial Safety in Ore Mining and Beneficiation in the city of Stary Oskol, where the Stoilensky tailings dam is located. The participants exchanged best practices on ways to ensure safety of hydraulic structures.*

WASTE GENERATED BY NLMK GROUP BY HAZARD CLASS, 2019, KT GRI 306-2



Service for Environmental, Industrial, and Nuclear Supervision Service (Rostekhnadzor)

- Environmental compliance assessment is performed twice a month
- Geological survey is carried out annually
- Planned inspections of the dam's technical condition and safety are performed annually involving specialized government agencies

- Hydraulic engineering structures at the tailings dam are checked involving government organizations, the general designer, and expert organizations at least once every three years

In September 2018, a comprehensive survey of Stoilensky TMF hydraulic engineering structures was conducted together with representatives of Rostekhnadzor, EMERCOM, and other specialized government agencies and entities. The survey assessed the ultimate safety level of the Stoilensky tailings hydraulic engineering structures as 'normal' (the best possible option).

There is a local warning system in place at Stoilensky and its operability is checked monthly by Stoilensky's own staff and Rostekhnadzor specialists. A contingency plan for hydraulic structures at the tailings dam has been drafted and is updated each year. Staff training is administered at least once a month. In April 2019, training sessions were held with participation of experts from EMERCOM. There is no need to monitor seismic activity in the area according to the appropriate determination of a specialized state committee.

The Group duly informs local communities about the existence of the tailings dam and holds regular public hearings regarding the development of the facility.

Stoilensky has introduced an Environmental Management System in accordance with ISO 14001:2015.

## EFFICIENT TAILINGS STORAGE TECHNOLOGY

Stoilensky, one of Russia's leading iron ore producers, employs an efficient and environmentally friendly treatment process for the beneficiation of waste rock. It involves liquid extraction followed by the forced transfer of thickened tailings to storage. This process returns 80% of industrial water used during transportation back into the beneficiation process. Additionally, the better resilience of thickened tailings to weathering significantly reduces the dust levels at the tailings dam. As there is no way for excessive water to come into the facility, the overflow risk is mitigated and pressure on the dams is reduced. Thus, given that the tailings are thickened and measures are taken to ensure the safety of hydraulic structures, the risk of dam failure at Stoilensky is under control and has a conditionally acceptable level. Estimates indicate that a transition to fully dry storage of tailings at Stoilensky would inevitably lead to strong dusting, and it would be impossible to completely curb dust, especially in summer. In light of this, the Group considers dry tailings storage to be an unacceptable environmental risk and considers tailings thickening to be the most effective technology for managing environmental risks.

## PRODUCTION LIFECYCLE

NLMK Group companies produce steel products that can be fully assimilated into the environment once they are no longer of use to consumers. In this regard, ferrous metal products are a valuable raw material that can be reused in steelmaking.

All steel produced by NLMK Group companies can be recycled and reprocessed. About 25% of the liquid steel output is produced from ferrous scrap. Thus NLMK Group's operations are part of the circular economy.

## Vtorchermet NLMK – a leader in scrap ferrous metal reprocessing

*One NLMK Group asset, Vtorchermet NLMK, is an industry leader in scrap metal processing technology. It collects and processes scrap ferrous metals, and supplies NLMK Ural, NLMK Kaluga, and NLMK Lipetsk with 85% of the high-quality scrap metal they need for steelmaking. The scrap metal that arrives at Vtorchermet NLMK is given a second life in the form of products that are in high demand across various industries: rebar, channels, angles, wire, fasteners, and flat-rolled products. Processing scrap metal helps both rid the environment of scrap and significantly reduce consumption of natural resources and energy.*

*Vtorchermet NLMK is a member of RUSLOM.COM, an organization whose mission and objectives include safeguarding Russia's access to raw materials and environmental safety by returning recycled resources to the economy and creating a high-tech and efficient sector for handling scrap metal and industrial and consumer waste.*

# BIODIVERSITY

NLMK Group conducts operations on both industrial lands and residential areas in line with applicable law. The Company's activities have no direct significant impacts on biodiversity. [GRI 304-2](#)

NLMK Group production sites are not located on industrial sites that are leased. More specifically, they are not situated on environmentally protected land or on land with a high biodiversity value. NLMK Group's activities do not pose any threat to animal or plant species registered on the IUCN Red List or in the Russian Red Book, or to species threatened with extinction. [GRI 304-1, 304-4](#)

The Group regularly implements measures that aim to rehabilitate land disturbed by the operations of its extractive companies (Stagdok, Dolomit). The treatment of deposit sites includes phased rehabilitation work to restore the landscape and its plant cover and to enable plants to grow again in the soil. [GRI 304-3](#) In 2019, rehabilitation was carried out on 15 hectares of disturbed land.

## NLMK Lipetsk is getting greener

*The first stage of tree and bush stocktaking has been completed at the Lipetsk site along the plant's arterial transport route running from the HQ Building to Blast Furnace Shop No. 2. Over 2,500 trees were checked by specialists from the Voronezh State Academy of Forestry Engineering.*

*As a result, an action plan was put together to replenish greenery at the site. It was launched in 2019, as October saw 680 poplars and 1,250 shrubs (spiraea, lilac) planted along the route. The plan for 2020 is to plant more than 530 seedlings of the Amur maple and to prepare planting locations for 2021.*

*The main objective of this long-term programme is to renew greenery. This should foster a favourable microclimate and create a natural green barrier to reduce the environmental impact of production operations. The premises of NLMK Lipetsk have always been green thanks to numerous trees, shrubs and planters. However, this new, deliberate, and fact-based effort will enable the industrial site to become even livelier and add a wide variety of canopies and leaves.*

## The Steel Tree initiative rolls out in five Russian regions

*NLMK Group is committed to promoting an environmentally aware culture and ensuring high environmental management standards in the regions where it operates. It aims to achieve this goal by training local residents in project management, and grants for this are made available by the Miloserdiye Charitable Fund. The grants are used to fund volunteering initiatives that aim to resolve current issues faced by local residents.*

*The Steel Tree initiative was launched in 2017 and provides environmental projects with financial support from NLMK's Miloserdiye Charitable Fund. Anyone can submit ideas as part of the initiative. In 2019, the programme was rolled out in five regions where NLMK Group operates: the Lipetsk, Kaluga, Belgorod and Sverdlovsk Regions as well as Altai Territory. The Steel Tree selection commission has received almost 200 ideas that aim to create a more favourable urban environment as well as implement social, environmental, and educational measures. The number of project participants has exceeded 15,000 people.*

## VIZ-Steel reclaims waste storage as parks

*VIZ-Steel launched a project to reclaim land in the industrial waste storage area that is now out of commission. The project to reclaim land in the former storage area was favourably received at a public hearing and received a positive review by the State Environmental Impact Assessment Authority. In 2019, during the technical stage of land reclamation, the site was stripped of asphalt and topsoil, and the subsoil was levelled and fertile ground was spread over it. The next biological stage, which includes planting out perennial grass, rowan trees, firs and ornamental shrubs on the reclaimed land, is set to kick off in 2020.*

*In 2019, VIZ-Steel also completed a project to reclaim the former industrial-waste landfill Lesnoy. According to an official conclusion by the Centre for Environmental Monitoring and Supervision of the Sverdlovsk Region's Ministry of Natural Resources, the landfill was delisted in the Sverdlovsk Regional Waste Cadastre under the 'reclaimed' status. The land plot, which is now suitable for recreational activities, has been handed over to a new owner for forestry. Thus, a source of negative environmental impact has been transformed into an environmentally friendly site.*

*Since 2007, the enterprise has been carrying out reclamation work, including technical and biological work, according to a project approved by a state environmental expertise review. The first stage involved the clean-up of drainage facilities, the construction of access roads, building slopes, and putting a multifunctional soil cover and a fertile soil layer into place. The second stage involved a set of agriculture engineering measures: planting about 3,000 coniferous and foliage trees, and sowing the slopes with perennial grasses.*

*The project resulted in the full restoration of 4.1 hectares of land and turned the former landfill into an eco-friendly environment. For example, forest birds have been nesting and raising chicks there for several years now. Continuous monitoring by the accredited environmental laboratory at VIZ-Steel confirms that the condition of soil, water and air in the Lesnoy area meets sanitary standards.*

# PLANS FOR 2020 AND THE MEDIUM TERM

NLMK Group is planning to implement significant environmental protection initiatives in future reporting periods under its Environmental Programme 2022. The initiatives seek to minimize our environmental impact, including by revamping major production facilities in line with the best available technologies.







# 532.8 PJ

total energy consumption in 2019 (–8.1% yoy)

# 0.172 Gcal/t

increase in specific energy intensity of steel production at the Lipetsk site (+3.1% yoy)

## Awards

NLMK Group was ranked third in the Top 20 Energy Efficient Companies annual ranking compiled by Expert RA based on performance data for 600 leading Russian companies

NLMK Lipetsk won the *Environmental Activity and Resource Saving* category at the 16th High Social Performance Mining and Metallurgical Enterprise Industry Competition

NLMK employees received awards at the 2019 *International Contest of Scientific, Engineering, and Innovative Developments Aimed at the Development of the Fuel, Power, and Mining Industries*. The contest is supported by the Russian Ministry of Energy

# ENERGY EFFICIENCY

## MAJOR THEMES

Energy

## KEY EVENTS IN 2019

- Large-scale overhauls were carried out at the Lipetsk site: at Blast Furnace No. 6, and at Basic Oxygen Furnace No. 2 in BOF Shop No. 2
- The fourth high-efficiency walking beam re-heating furnace was commissioned at the Hot Rolling Shop at the Lipetsk site
- Project documentation was completed and preparations began at the construction site for a new recovery power plant to be fuelled by recyclable gases from steel production
- Investment projects to optimize power supply systems were implemented at the NLMK Ural sites. Co-generation plants were put into operation at the sites in Beryozovsky and Nizhniye Sergi, and a new gas boiler house was commissioned at the Revda site

## UNITED NATIONS GLOBAL COMPACT PRINCIPLES

- **Principle 7:** Businesses should support a precautionary approach to environmental challenges.
- **Principle 8:** Businesses should undertake initiatives to promote greater environmental responsibility.
- **Principle 9:** Businesses should encourage the development and diffusion of environmentally friendly technologies.

## GLOBAL SUSTAINABLE DEVELOPMENT GOALS





# OUR APPROACH TO MANAGING ENERGY EFFICIENCY

Steelmaking is an energy-intensive industry. NLMK Group systematically pursues energy efficiency improvements in its operations. This includes identifying and applying integrated solutions to ensure the reliable supply of energy resources and reduce costs as well as using energy sparingly in order to minimize the environmental impact.

In 2019, the Company developed NLMK Group's Integrated Management System Policy in Quality, Environmental Protection, Energy Efficiency, and Occupational Health and Safety (IMS Policy). The new policy, which supersedes the NLMK Energy Policy, sets forth an updated vision, goals, principles, and management commitments related to the improvement of energy efficiency.

Some of the goals of the IMS Policy are to become a leader in the adoption of international best practices to drive energy efficiency in operations and to achieve the minimum technically and economically feasible level of specific energy intensity and production costs. The main principles of the IMS Policy aim to ensure that NLMK Group reduces the resource intensity of its operations by consistently acting on the following items:

- Reduction of the specific consumption of natural raw materials, water, fuel, and energy
- Improvement of production process efficiency
- Integration of resource reuse systems and best available technologies (BATs)

The Group's commitments under the IMS Policy go beyond introducing advanced energy efficient technologies and solutions that reduce the consumption of natural and secondary energy

resources. The Group is additionally committed to developing power generation capabilities that utilize metallurgical gases and other secondary energy resources, and to supporting the use of renewable energy sources where applicable and reasonable.

The Unified Technical Policy on Energy Complex Management has been in effect at NLMK Group's Russian companies since 2014. One of this policy's objectives is to introduce the most advanced technical solutions, machinery, and technologies that bolster the reliability, efficiency, and safety of the Group's energy complex. The policy also sets out priorities and rules for applying technical solutions related to the utilization of energy facilities, the implementation of investment programmes for new construction and the re-tooling of core equipment, and overhauls of energy assets belonging to NLMK Group companies along with the innovative and promising development of these companies.

The Vice President for Energy and the units reporting to him work to frame the principles and strategic goals for improving the energy efficiency of production and to develop energy facilities in addition to setting energy efficiency KPIs and tracking them. Each year the directors of NLMK Group companies approve a list of initiatives to improve energy efficiency and the targets for the rational use of energy resources.

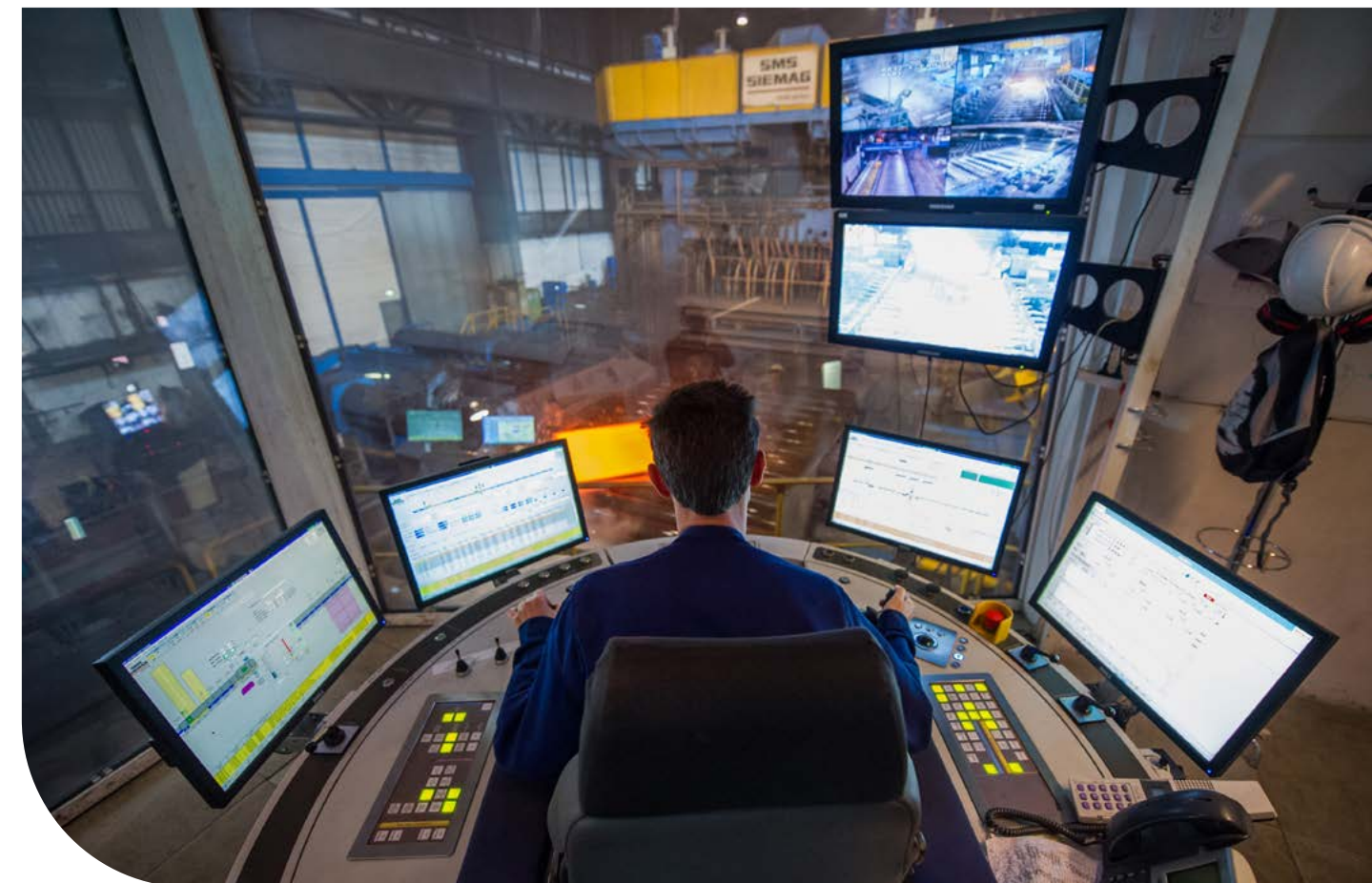
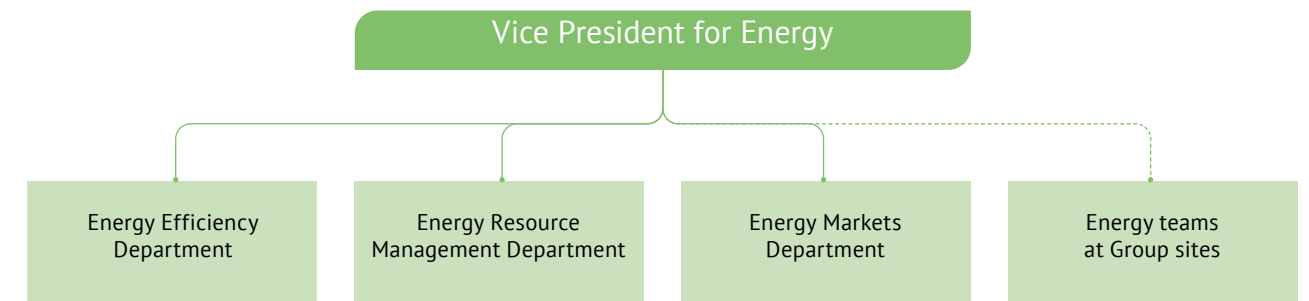
A key performance indicator for improving energy efficiency is the specific energy intensity of production (Gcal/t of output). The targets for key performance indicators are determined based on statistical data, an analysis of the potential for process improvements, and the results of benchmarking similar machinery and conversion stages, both within and outside the Company.

## CERTIFICATION

The Company operates an 'umbrella' energy management system, as approved by Certificate No. ENMS 598731, which encompasses nine core production sites:

- 1 NLMK Lipetsk
- 2 VIZ-Steel
- 3 Altai-Koks
- 4 Dolomit
- 5 NLMK Kaluga
- 6 NLMK Metalware
- 7 NLMK Ural
- 8 Stagdok
- 9 Stoilensky

## ENERGY MANAGEMENT STRUCTURE AT NLMK GROUP



NLMK DanSteel is also certified under ISO 50001 Energy management.

All the Group's companies are certified for compliance by international certification bodies.

In 2019, the Group took action to bring the energy management systems of its companies into compliance with the 2018 version of ISO 50001. This work should

be completed in 2020 and the appropriate certification authority will verify its results.

## MEMBERSHIP AND PARTICIPATION IN ORGANIZATIONS

NLMK Group is a member of the Russian Association of Energy Consumers, a non-profit partnership that aims to protect the interests of member companies on industry platforms and within federal bodies that regulate energy development.



# ENERGY RESOURCE CONSUMPTION IN 2019

NLMK Group uses a variety of non-renewable energy resources in its production activities. Approximately 17.1% of all energy consumed comes from natural gas and 37.1% comes from coal.

In 2019, total energy consumption within the Company stood at 532.8 PJ, which is 46.8 PJ lower than in 2018. This reduction was achieved thanks to energy-saving measures and decreased output due to the repair of production units.

In 2019, the use of electrical power generated from renewables accounted for 5.1% of total power consumption<sup>1</sup>.

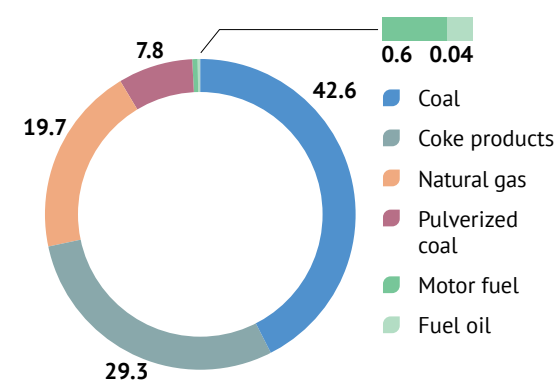
## GROSS ENERGY CONSUMPTION BY NLMK GROUP IN 2015–2019<sup>2</sup>, PJ GRI 302-1



## CONSUMPTION FROM NON-RENEWABLE SOURCES BY NLMK GROUP IN 2015–2019<sup>2</sup>, PJ GRI 302-1



## BREAKDOWN OF NON-RENEWABLE FUEL CONSUMPTION BY NLMK GROUP IN 2019, % GRI 302-1



<sup>1</sup> The share of 1.6% (source: hydro) in the electricity purchased by sites located within the Centre Integrated Power System (NLMK Lipetsk, Stoilensky, Stagdok, Dolomit, NLMK Kaluga); share of 2.3% (sources: hydro, wind, solar) in the electricity purchased by sites located within the Urals Integrated Power System (NLMK Ural, NLMK Metalware, VIZ-Steel) [Share of generation from renewables as assumed for the Russian Federation as of the end of 2018 according to the annual operations report of the Unified Energy System of Russia in 2018 [https://so-ups.ru/fileadmin/files/company/reports/disclosure/2019/ups\\_rep2018.pdf](https://so-ups.ru/fileadmin/files/company/reports/disclosure/2019/ups_rep2018.pdf) p. 19]

The share of 22% (source: wind, solar, biofuel) in the electricity purchased by sites located in Belgium (NLMK La Louvière, NLMK Clabecq); the share of 20% (source: hydro, wind, solar, biofuel) in the electricity purchased by sites located in France (NLMK Strasbourg); the share of 40% (source: hydro, wind, solar, biofuel) in the electricity purchased by sites located in Italy (NLMK Verona); the share of 75% (source: wind, solar, biofuel) in the electricity purchased by sites located Denmark (NLMK Dansteel) [Share of generation from renewables as assumed for Europe as of the end of 2018 according to the report 'The European Power Sector in 2018' [https://www.agora-energiawende.de/fileadmin2/Projekte/2018/EU-Jahresauswertung\\_2019/Agora-Energiawende\\_European-Power-Sector-2018\\_WEB.pdf](https://www.agora-energiawende.de/fileadmin2/Projekte/2018/EU-Jahresauswertung_2019/Agora-Energiawende_European-Power-Sector-2018_WEB.pdf) p. 7]

The share of 17% (source: hydro, wind, solar, biofuel) in the electricity purchased by sites located in the U.S. (NLMK Indiana and NLMK Pennsylvania). [Share of generation from renewables as assumed for the U.S. as of the end of 2018 according to Monthly Energy Review US by the Energy Information Administration <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> p. 127].

The share of renewables in the total volume of electrical power generation is shown without transit flows; NLMK Group companies made no direct purchases from renewable energy suppliers.

<sup>2</sup> The methodology was adjusted to calculate the consumption of electric power, natural gas, and motor fuel so as to isolate consumption volumes by individual sites.

## NLMK GROUP CONSUMPTION OF NON-RENEWABLE FUELS IN 2015–2019<sup>3</sup>, PJ GRI 302-1

Fuel type	2015	2016	2017	2018	2019
Coal	240.8	237.5	234.8	217.5	197.6
Natural gas	103.5	99.4	91.6	87.2	91.3
Coke products (coke breeze, lump coke, coke nut)	162.4	158.9	158.4	153.4	136.2
Pulverized coal	15.6	18.1	28.4	43.3	36.2
Motor fuel (petrol, diesel, liquefied gas)	2.7	2.7	2.6	2.7	2.8
Fuel oil	0.2	0.3	0.0	0.0	0.2
<b>Total</b>	<b>525.2</b>	<b>516.8</b>	<b>515.9</b>	<b>504.1</b>	<b>464.2</b>

## CONSUMPTION, GENERATION, AND SALE OF ELECTRICITY AND THERMAL ENERGY BY NLMK GROUP, 2015–2019, PJ GRI 302-1

Indicator	2015	2016	2017	2018	2019
<b>Electricity and thermal energy obtained for consumption</b>					
Electrical power obtained	79.43	83.06	87.32	87.30	78.47
Thermal energy obtained as steam	0.46	0.45	0.51	0.50	0.48
Thermal energy obtained as hot water	1.51	1.64	1.52	1.59	1.33
<b>Total</b>	<b>81.40</b>	<b>85.15</b>	<b>89.35</b>	<b>89.39</b>	<b>80.28</b>
<b>In-house electricity and thermal energy generation</b>					
Electricity generation	50.22	46.99	46.34	49.36	50.01
Thermal energy as steam	24.83	23.76	23.74	21.86	21.72
Thermal energy as hot water	8.45	8.70	7.99	9.84	7.47
<b>Total</b>	<b>83.50</b>	<b>79.44</b>	<b>78.06</b>	<b>81.06</b>	<b>79.20</b>
<b>Electricity and thermal energy sold to external consumers</b>					
Electricity sold and transmitted	13.35	11.06	11.78	10.70	8.98
Thermal energy sold and transmitted as steam	0.35	0.34	0.36	0.35	0.37
Thermal energy sold and transmitted as hot water	2.62	2.69	2.56	2.76	2.36
<b>Total</b>	<b>16.33</b>	<b>14.08</b>	<b>14.70</b>	<b>13.81</b>	<b>11.71</b>

## SPECIFIC ENERGY INTENSITY<sup>4</sup> AT THE LIPETSK SITE IN 2015–2019, GCAL/T GRI 302-3

Indicator	2015	2016	2017	2018	2019
Specific energy intensity	5.665	5.599	5.491	5.469	5.641

<sup>3</sup> Consumption of natural gas, fuel oil and motor fuel was adjusted in line with changes to the calculation methodology

<sup>4</sup> Specific energy intensity = (energy consumption during steel production / extraction and processing of raw materials, Gcal) / (steel production / extraction and processing of raw materials, t)

The following types of energy resources were used in the calculation: purchased – coking coal, pitch coke, lump coke, coke breeze, pulverized coal, natural gas, fuel oil, thermal energy as hot water, steam, electricity, oxygen (NLMK Kaluga), and heat from chemically treated water (VIZ-Steel); sold – coke breeze, coke nut, chemical products, blast furnace gas, steam, thermal energy as hot water, oxygen, nitrogen, compressed air, industrial water, hydrogen, and commercial pig iron.

## CAPTIVE ELECTRICITY GENERATION

The Company has managed to reduce energy costs by implementing optimization initiatives and increasing captive electricity generation.

Maximizing the utilization of available recyclable energy is one of the main challenges faced by NLMK Group; overcoming this challenge will make it possible to not only minimize costs, but to also reduce our environmental impact by slashing emissions of harmful substances and greenhouse gases.

In the reporting period, the total installed in-house generation capacity was 733 MW: 522 MW at the Lipetsk site and 200 MW at Altai-Koks; the installed capacity of gas-piston units at NLMK Ural was 11 MW.

Electricity is generated at the Company's captive power plants, which are chiefly powered by recycled fuel gases from steel production.

Over half of the electricity consumed at the Lipetsk site and 100% of the electricity consumed at Altai-Koks is generated using NLMK Group's captive recyclable resources.

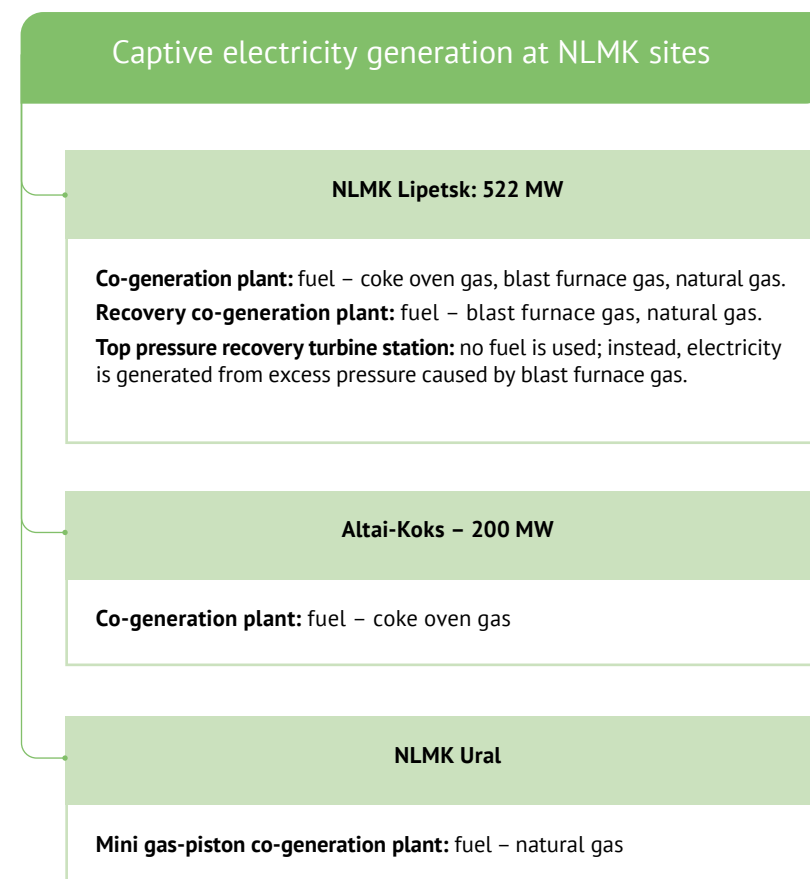
The recovery of secondary energy resources for the purposes of power generation is an important tool to improve the energy efficiency and lessen the environmental impact of production operations. The Lipetsk site in particular generates electricity using by-product gases from coke and blast furnace production processes as fuel. Between 2017 and 2019, the share of captive generation at NLMK Lipetsk rose from 53% to a record high of 65% in the power consumption mix. The increase resulted from the commissioning of the 60 MW turbine generator unit No. 5 at the co-generation plant in 2018 and the implementation of an equipment efficiency project at this plant and the recovery plant.

### Launch of new waste energy plant running on by-product gases to boost Lipetsk site's self-sufficiency in electricity to 94%

*In 2019, NLMK Group began drafting project documentation and preparing a construction site for the new recovery co-generation plant at NLMK Lipetsk. Recyclable BOF and BF gases from steel production will fuel the new plant. The new recovery co-generation plant will have installed capacity of 300 MW. Investment in the project is estimated at RUB 35 bn.*

*The plant will make it possible to reduce greenhouse gas emissions (CO<sub>2</sub>) by 650,000 t per year. The construction of the new recovery power plant running on by-product gases from steelmaking operations is in line with industry BAT's and advances the objective of Russia's national Clean Air initiative as part of Ecology National Project. Once commissioned, the new recovery co-generation plant will increase the self-sufficiency of the Lipetsk site in electricity from the current 65% up to 94%.*

#### CAPTIVE ELECTRICITY GENERATION AT NLMK SITES



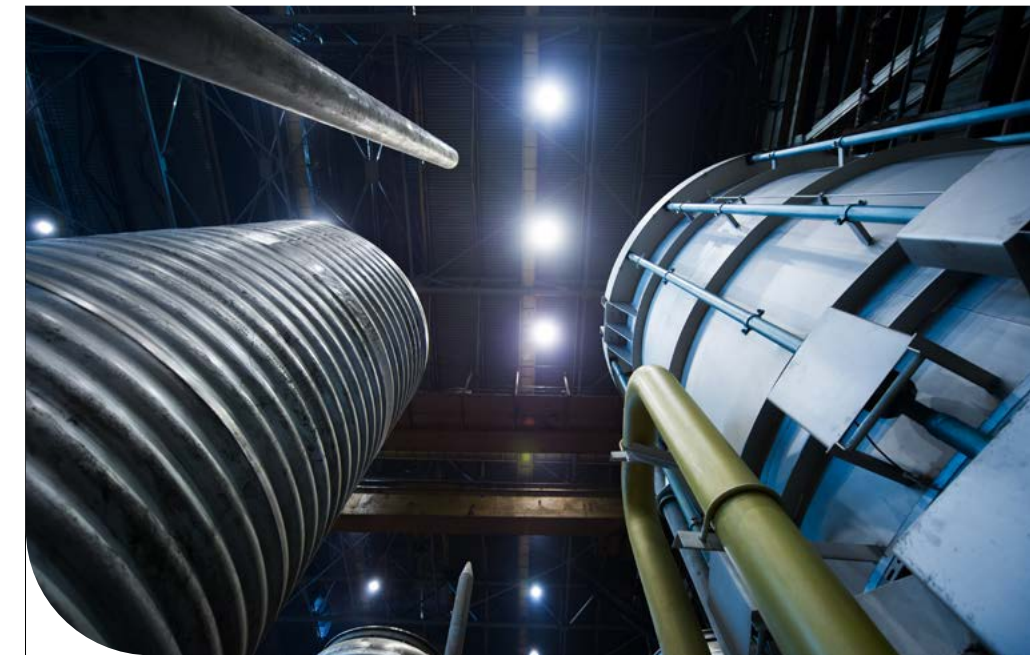
## IMPLEMENTING ENERGY-SAVING MEASURES

During the reporting period, NLMK Group implemented a number of energy efficiency projects at its sites to address the following issues:

- Improving the energy efficiency of core and auxiliary processes
- Efficient management of energy distribution based on the source load
- Reducing energy consumption through the analysis and monitoring of each production stage

Specifically, measures were taken in 2019 to optimize the operating modes of boilers at the co-generation and recovery plants at the Lipetsk site and upgrade turbine units. Additionally, the configuration of heat supply networks at the Lipetsk site was optimized.

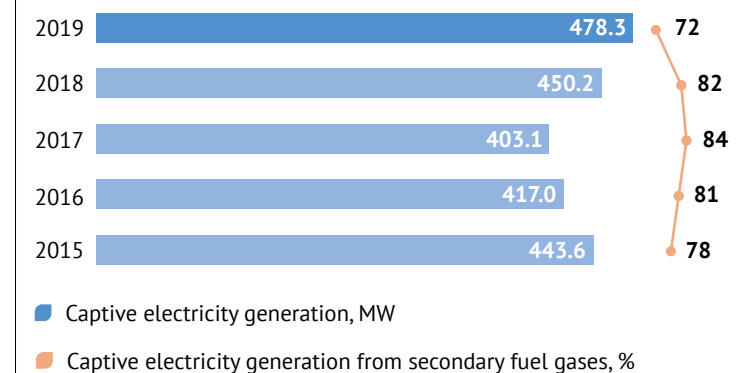
As part of target-oriented programmes, lighting fixtures at NLMK Group sites were replaced with more advanced and efficient solutions. Previous work to improve efficiency was continued, such as the replacement of pumping equipment and projects to improve the efficiency of compressor operation. The optimization of the cooling towers created better water cooling efficiency, which in turn increased the generation of captive electricity.



#### SHARE OF CAPTIVE ELECTRICITY IN TOTAL ELECTRICITY CONSUMPTION AT NLMK LIPETSK, 2015–2019, %



#### CAPTIVE ELECTRICITY GENERATED AT NLMK LIPETSK, 2014–2019<sup>1</sup>



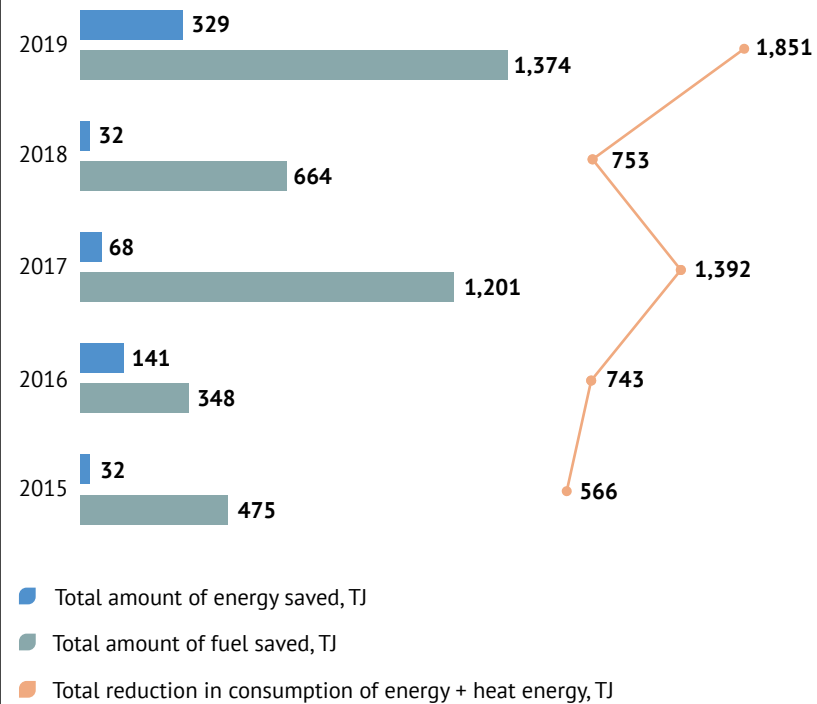
<sup>1</sup> The share of captive electricity generation from secondary fuel gases was reduced in 2019 due to shutdowns of blast furnaces related to major repairs.



## OPTIMIZATION INITIATIVES UNDERTAKEN BY NLMK GROUP IN 2019

The energy efficiency and optimization projects carried out in 2019 for the co-generation and recovery plants at NLMK Lipetsk and the co-generation plant at Altai-Koks aimed to improve the operating modes and control algorithms of the main boiler and turbine regulator, overhaul turbine nozzle blades, utilize industrial extraction from the turbine, optimize steam turbocharger operating conditions, and improve algorithms for the boiler burner switchover. Intra-shop process diagrams and configuration networks for the transmission of air separation products have been optimized at the Oxygen Shop. The heat supply system to VIZ-Steel was modified with heat insulation, and pumping equipment was retrofitted with more efficient units at Stoilensky and NLMK Ural. NLMK Lipetsk and VIZ-Steel completed another stage of comprehensive upgrades to their lighting equipment.

REDUCTION OF ENERGY CONSUMPTION AS A RESULT OF ENERGY-SAVING INITIATIVES (PROGRAMMES) AT THE LIPETSK SITE, 2015–2019 GRI 302-4



## NLMK Ural builds new energy facility to supply electricity and heat

The energy facility is located at the NLMK Ural site in Nizhniye Sergi. The facility includes three 7 MW hot water boilers and a gas-piston plant to generate electricity. The heart of the complex is a generator powered by a 4.5 MW gas-piston engine. In addition to electrical power, the energy facility generates heat. The project uses modern equipment to further cut the cost of purchased power and heat. The project budget was RUB 300 m.

## New types of energy facilities launched at NLMK Long sites

The new mini co-generation plant increases the efficiency of power supply to the production site in Beryozovskoye. Construction on the mini plant began in late 2018 and was completed in 2019. The power plant will supply the NLMK Metalware and NLMK Ural production sites with captive electrical power, heat, and hot and chemically treated water for rolling operations. The new facility is equipped with energy-efficient cascaded controls and runs two gas-piston units with total installed capacity of 6.5 MW (2 MW + 4.5 MW). The units are capable of generating both electrical and thermal energy. If the temperature drops, hot water boilers are put into operation: the boiler house has installed thermal capacity of 31.7 MW.

# PLANS FOR 2020 AND THE MEDIUM TERM

One of the key goals of Strategy 2022 is to improve operational efficiency, including the efficiency of energy supplies to the Group.

The main objectives aimed at improving energy efficiency in 2020 and the medium term include:

- Improving the efficiency of power generating equipment

- Optimizing process charts for the production of technical gases
- Improving the efficiency of compressor equipment
- Replacing pumping equipment with more energy efficient units
- Improving the efficiency of cooling equipment
- Reducing the amount of thermal energy procured from third parties
- Developing innovative solutions in energy

## NLMK Ural commissions new boiler house at Revda

The boiler house at the Revda site consists of modern, advanced equipment supplied by leading international vendors. This ensures efficient and safe operation and significantly reduces the cost of heat supply. The boiler house is equipped with three water heating boilers with total capacity of 19 MW and two steam boilers with steam output of 10 tph. The new facility fully covers the plant's need for thermal energy. The steam from the boilers will be used in the operations of the EAF and Energy shops. Since 25 September 2019, the boiler house has been supplying heat to all facilities on the production site itself and outside battery limits, including the Demidov Centre and the plant management and administration building at 1 Karl Liebknecht St.

The investment capex in the new boiler plant totalled RUB 150 m. The payback period is about three years.