

The audit confirmed that MMC Norilsk Nickel’s EMS complies with ISO14001:2015 (Compliance Certificate No. RU228136 QE-U of 4 December 2017). Based on the audit findings, BVC issued recommendations on potential improvement areas and highlighted the overall strengths of the Company’s EMS.

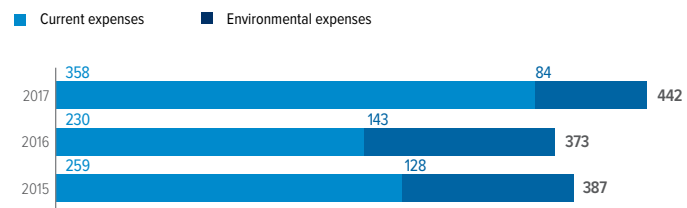
In 2017, the EMS operated in accordance with the new version of ISO 14001:2015. To comply with this international standard, among other things, the Company revised its Environmental Policy approved by MMC Norilsk Nickel’s Board of Directors (resolution No. GMK/33-pr-sd of 5 October 2017).

In line with ISO 14001 and principles of environmental openness and transparency, the Company cooperates with the legislative and executive authorities, control and supervision agencies, international and public organisations, mass media, shareholders, investors, local communities and other stakeholders.

Nornickel’s environmental projects

High sulphur dioxide emissions resulting from sulphide ore smelting is one of the Company’s key environmental issues. Nornickel’s strategic plan is to transform the Company into a cleaner and environmentally safe enterprise. To this end, the Company is gradually upgrading its production capacities.

Expenses // USD mln



-5%

reduction of sulphur dioxide emissions across Polar Division in 2017

-75%

reduction of sulphur dioxide emissions in the Polar Division as a result of the Sulphur project by 2023

Key environmental projects:

- Nickel Plant shutdown (completed in 2016);
- Sulphur Project (to be completed by 2023);
- transition to a concentrate briquetting technology (completed in 2017) and retrofit of the Zapolyarny Concentrator (to be completed by 2019).

Nickel Plant shutdown: what does it mean for the environment?

The shutdown of Nickel Plant and transfer of all nickel smelting operations to Nadezhda Metallurgical Plant helped to upgrade the production chain and improve environmental situation in the city as a result of:

- discontinued emissions of air pollutants (approximately 370 ktpa);
- eliminating 600 sources of air pollution, of which 458 had no purification facilities;
- closure of two wastewater discharge points previously discharging approximately 37 kt of pollutants per annum;
- discontinued generation of ca. 1,400 kt of production waste, including coal processing products, metallurgical slag, and ferrous cake;
- transfer of smelting emissions from Nickel Plant to Nadezhda Metallurgical Plant, that is 7 km farther away from the residential area;
- 30% less exposure time as compared to how long the air of Norilsk was exposed to Nickel Plant emissions (approximately 265 hours in the course of 73 days (based on 2015 data)).

Sulphur Project

Sulphur project is an umbrella term of the second stage of Nor Nickel’s environmental programme designed to reduce the total volume of sulphur dioxide emissions at Polar Division by 75% down to

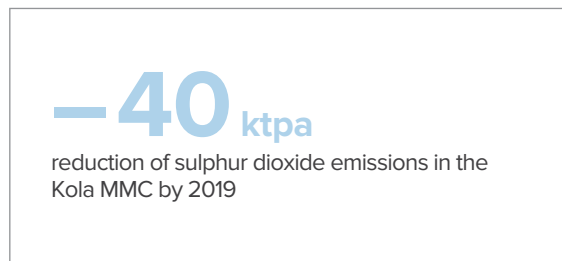
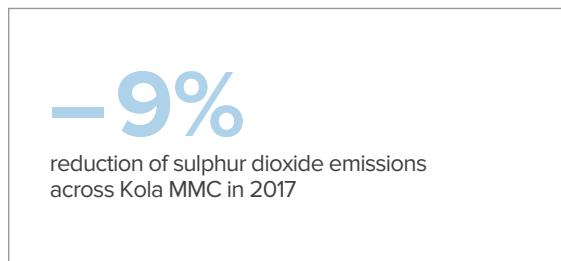
337 ktpa by 2023. This will guarantee that Norilsk air meets the air quality requirements regardless of wind speed or direction.

As part of this project, Nadezhda Metallurgical Plant is going to see construction of installations for capturing sulphur-rich gases and production of sulphuric acid (with subsequent neutralisation with natural limestone and production of gypsum), as well as principally new continuous copper matte converting facilities built, whose emissions will also be used for sulphuric acid production.

At Copper Plant, additional capacities for elemental sulphur production are expected to be commissioned, while converting operations are going to be completely discontinued, which will eliminate low-height emissions of low grade converter gases that have a pronounced effect on ground level concentrations of sulphur dioxide during unfavourable weather conditions. The total capacity for recovering sulphur from gases at Copper Plant is expected to reach ca. 280 ktpa of sulphur by 2022. The total CAPEX for the Sulphur Project is estimated in the range of USD 2.5 bn.

Kola MMC

At Kola MMC, a separate action plan has been developed and partially implemented to reduce sulphur dioxide emissions from smelting operations at the Nickel site by upgrading the equipment (reconstruction of feeding and sealing systems of ore-thermal furnaces, gas duct replacement, preparation of furnace charge for smelting, etc.) and lowering smelting shop utilisation while selling part of the concentrate to third parties. This project is expected to reduce sulphur dioxide emissions down to 40 ktpa by 2019.



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Environmental impact across Norilsk Nickel's Russian operations



Air

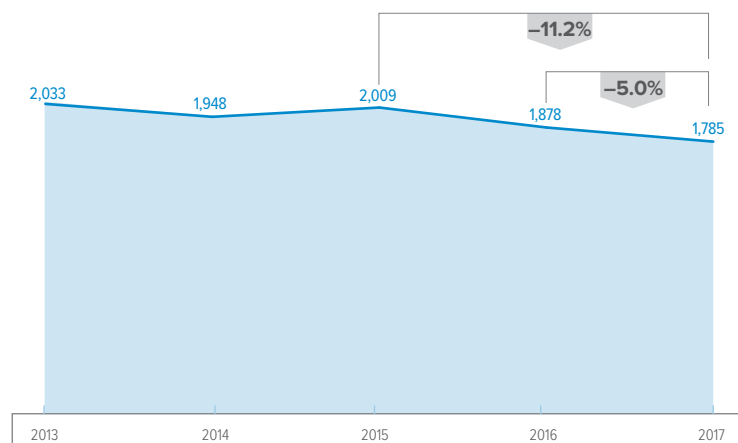
Air pollutant emissions across the Group // kt

Item	2015	2016	2017
Amount of pollutants, across the Group, including:	2,063.5	1,936.4	1,846.8
Sulphur dioxide (SO ₂)	2,009.1	1,878.0	1,785.0
Nitrogen oxide (NO _x)	9.8	10.1	11.5
Solids	20.7	14.3	14.0
Other	23.9	34.1	36.3
Amount of pollutants, total for Polar Division, including:	1,883.2	1,787.6	1,705.0
Sulphur dioxide (SO ₂)	1,853.9	1,758.2	1,675.9
Nitrogen oxide (NO _x)	1.6	1.5	1.6
Solids	9.0	6.2	6.1
Other	18.7	21.7	21.5
Amount of pollutants, total for Kola MMC, including:	169.8	132.9	121.9
Sulphur dioxide (SO ₂)	155.1	119.7	109.1
Nitrogen oxide (NO _x)	1.2	1.1	1.2
Solids	10.6	7.4	6.9
Other	2.9	4.7	4.7
Amount of pollutants, total for other branches and subsidiaries, including:	10.5	16.0	19.9
Sulphur dioxide (SO ₂)	0.1	0.1	0.1
Nitrogen oxide (NO _x)	7.0	7.5	8.7
Solids	1.1	0.7	1.1
Other	2.2	7.7	10.0

In 2017, gross emissions of Norilsk Nickel's Russian operations exceeded 1,847 kt, which is 90 kt lower than in 2016 (-4.6% y-o-y). The reduction was due to lower sulphur dioxide emissions (down 5.0%) primarily resulting from the liquidated emission sources at Nickel Plant and discontinued pellet production at the pelletisation and roasting section of Kola MMC's Zapolyarny site and other initiatives.

With the launch of a unit to produce sulphite/bisulphite reagents in 2017, the Company is now able to produce this reagent at a new facility using state-of-the-art technologies. Besides, recycling of off-gases helped to reduce sulphur dioxide emissions by another 11.5 ktpa.

Sulphur dioxide emissions // kt



In 2017, gross emissions of harmful pollutants in general across Polar Division have dropped by 82.6 kt (down 4.6% y-o-y) mostly as a result of a reduction in sulphur dioxide emissions by 82.3 kt (down 4.7%). Lower sulphur dioxide emissions are attributable to the shutdown of Nickel Plant and migration of smelting operations to modern technologies of Nadezhda Metallurgical Plant.

Analysis of actual emissions for 2017 demonstrated that pollutant emissions at Polar Division as a whole are 160,998 kt (down 8.6%) below the permitted level (with NO rebased to NO₂), including sulphur dioxide emissions that are below the statutory maximum as temporarily approved at 149 kt (down 8.2%).

In 2017, further steps were taken to reduce air emissions with a view to gradually achieving maximum permissible emission rates. The sulphur projects rolled out at Copper Plant and Nadezhda Metallurgical Plant are at different completion stages.

For more details, please see [Key investment projects](#).

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At Kola MMC's Zapolyarny site, a cold briquetting technology was introduced in recent years instead of pellet roasting. Two new briquetting lines are now in operation, and the briquetting technology is being fine-tuned to meet the required quality standards. Sulphur dioxide emissions generated by the production processes reduced from 4.8 kt in 2016 to 1.6 kt in 2017.

In Monchegorsk, we are implementing the project – Electrowinning of Chlorine Dissolved Tube Furnace Nickel Powder for the Production Volume of 145 ktpa of Electrolytic Nickel. The project includes reconstruction of cathode nickel facilities in the tank-house to replace the existing electrorefining technology (using soluble anodes) with electrowinning of nickel from chlorine solutions. The new technology will help to reduce air emissions thanks to elimination of anode smelting.

Nornickel has completed its project to produce 3,000 t of electrolytic cobalt fully replacing flame-synthesised cobalt production at the shut down Nickel Plant in Norilsk.

In 2017, gross pollutant emissions from Kola MMC amounted to 121.9 kt, which is 11 kt lower than in 2016 (down 8.3% y-o-y). Sulphur dioxide emissions also reduced by almost 11 kt (down 8.9%), as well

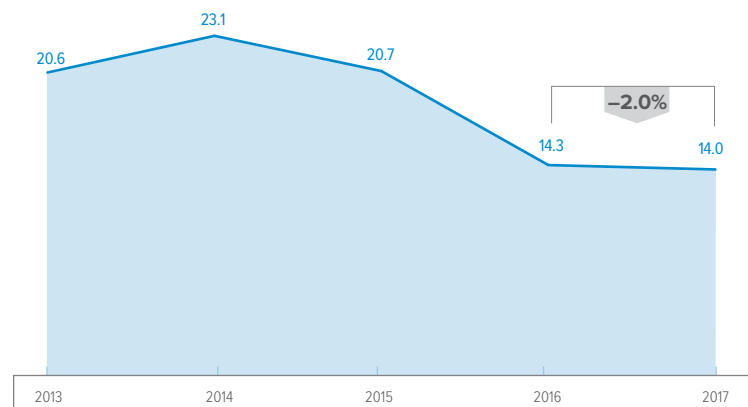
as solid (dust) emissions dropping by 480 t (down 6.5%). Lower pollutant emissions as compared to 2016 are attributable mainly to the discontinued pellet production at the Zapolyarny site, along with increased production of sulphuric acid and decreased content of sulphur in the products used for smelting purposes.

Nornickel controls emissions during unfavourable weather conditions to lower concentration of pollutants in residential areas based on timely weather forecasts. In the reporting period, a total of 182 emission control cases were held at Polar Division's metallurgical operations. To inform the local community of the environmental impact of its metallurgical operations on the quality of air in Norilsk, the Company maintains an automatic toll-free enquiry service line offering environmental forecasts for the city area to anyone dialling 007 or 420 007.

At the moment, Russian legislators are working to introduce statutory requirements for greenhouse gas (GHG) emissions reporting. The Company is monitoring all legislative developments on this front to ensure compliance with the regulations.

In accordance with the applicable guidelines and regulations, Nornickel has assessed its GHG emissions. Based on the current estimates, the Company emits around 10 mtpa of GHG¹ (10,031 kt in 2016). In addition, in 2017, the Company reported, on a voluntary basis, its GHG emissions to the Russian Ministry of Natural Resources and Environment.

Solid emissions // kt



Water

Nornickel uses a closed water circuit at its mining and metals operations. In general, 85% of all water used by the Company is recycled and reused.

All sources of water used by the Company are subject to government-approved surveillance programmes for water and water protection zones.

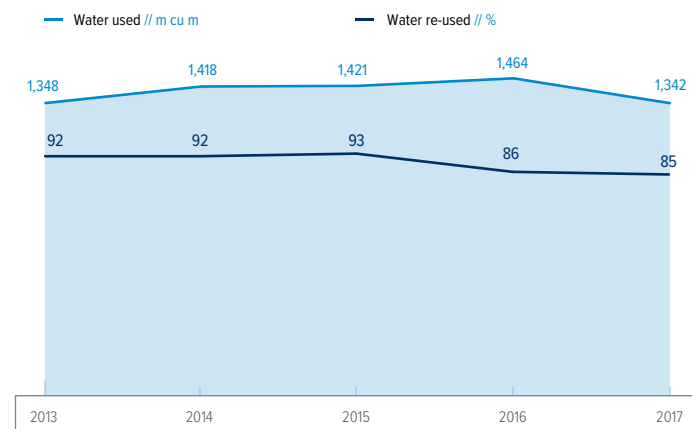
Pollutants discharged in wastewater amounted to 217 kt, which is 24 kt more than in 2016 (up 12%). The increase was caused by a natural inflow of snow melt and rain water, large-scale processing of metal-containing feedstock and ramping up of pyrometallurgical capacities at Nadezhda Metallurgical Plant after the shutdown of Nickel Plant.

In 2017, the Company continued to work on reducing discharges by gradually achieving the approved limits on the back of:

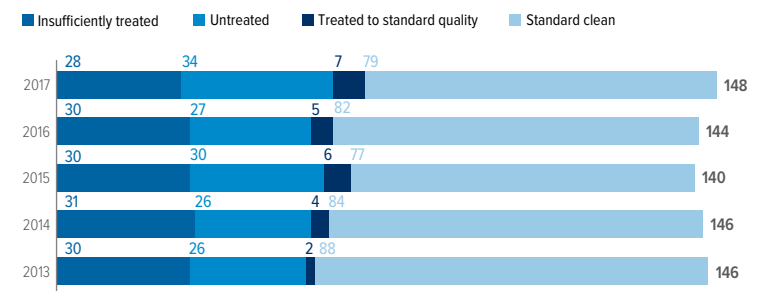
- optimised water cycle at Polar Division's concentration facilities;
- efforts made to purify production wastewater in the combined storm water collector and utility tunnel of Nadezhda Metallurgical Plant, as well as production wastewater from Lebyazhye tailings pit at Norilsk Concentrator;
- technologies developed to treat mine water at some mines;
- completion of pre-commissioning stage at the cement plant to implement a closed water circuit and local treatment facilities.

Monchegorsk site received a treatment facility for saline effluent from nickel refining operations for a more integrated treatment of industrial effluents. This technology is unique for Russia, as chemical agents, specifically boric acid, flow back to the production circuit. So the Company produces sodium sulphate and chloride instead of harmful waste. The resulting steam and condensate are then reused in the nickel tank-house to heat solutions, operate heat exchangers. At Zapolyarny site, work is in progress to design a mining water treatment plant for Severny-Glubokoy Mine.

Water consumption



Wastewater discharges // mln cubic meters



¹ The Group's direct GHG emissions were stated based on the earlier estimates (ca. 10 mt of CO₂ equivalent) made as part of a project to pilot the Guidelines and Instructions approved by Order of the Russian Ministry of Natural Resources No. 300 dated 30 June 2016. The quantitative estimates include carbon dioxide (CO₂) and methane (CH₄) emissions only. Pursuant to the above guidelines and instructions, reporting of other types of GHG emitted by the Company's facilities is not required. Indirect energy-related GHG emissions were not assessed by the Company. There are currently no binding legal requirements in place on reporting GHG emissions, including the indirect energy-related ones.

In 2017, Kola MMC received a treatment facility for saline effluent.



For more details on the modernization of the Kola MMC



For more details in an interview with the General Director of Kola MMC

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Production waste

Norilsk Nickel’s waste management efforts seek to ensure the repeated use of waste in its production cycle along with meeting statutory waste disposal limits. In 2017, the Company generated approximately 32 mt of production and consumption waste, and around 96% of such waste is deemed virtually non-hazardous for the environment and classified as hazard class 5 waste. This is mostly waste from the mining and smelting operations (rock and overburden, tailings, and metallurgical slags). Nearly 65% of all waste generated across the Company’s operations in 2017 was reused, with the rest of waste disposed of at special facilities.

For safe waste disposal, the Company completed the construction of a new tailings pit for Talnakh Concentrator, 6 km farther to the north-west of the Talnakh District. The facility was built using the most advanced technologies to reduce environmental impact.

Nornickel has designed a new waste dump for industrial waste generated by Polar Division that leverages environmentally safe technologies to

dispose of waste of hazard classes 3–5. The site selected for the waste dump is located 2 km south of Nadezhda Metallurgical Plant site, at a significant distance from the residential areas of Norilsk.

The Company continues reusing waste for preparation of compounds to fill mined-out spaces (granulated slag from melting of non-ferrous metals, overburden and hard rocks, mill tailings) and as flux for melting of metal in smelting furnaces.

In 2017, the Company’s waste disposal did not exceed the limits. Waste is mostly reused in the processes related to the extraction of ore mineral resources, including crushing, backfilling of mined-out areas and pits, and construction and strengthening of tailings pits.

The Company’s waste management efforts are focused on the following:

- development of waste disposal sites to reduce human impact on the environment;
- waste reuse maximisation;
- reclamation of disturbed areas;
- landscaping and improvement projects.

Waste generation by hazard class // kt

Hazard class	2016	2017
Hazard class 5	32,118.4	30,721.8
Hazard class 4	1,113.5	1,189.9
Hazard class 3	29.9	12.7
Hazard class 2	5.8	2.4
Hazard class 1	0.07	0.06
Total	33,267.7	31,926.9

Environmental impact across Norilsk Nickel's foreign operations

Norilsk Nickel Harjavalta

Norilsk Nickel Harjavalta has all the necessary environmental permits and operates a certified integrated management system that meets the requirements of ISO 9001, ISO 14001 and OHSAS 18001.

Norilsk Nickel Harjavalta's main environmental impact consists in the emissions of ammonia (NH₃) and nickel (Ni), and discharges of nickel, sulphates (SO₄²⁻) and ammonia ions (NH₄⁺). In 2017, Norilsk Nickel Harjavalta met all permit requirements for emissions, discharges and waste disposal volumes. Lower (by 1.5 kt) waste volumes are a result of switching to the Company's feedstock that is less contaminated with impurities as compared to third party materials.

Environmental impact metrics of Norilsk Nickel Harjavalta

Item	2015	2016	2017
Industrial wastewater, '000 cu m	728	771	899
Pollutants in industrial wastewater, t			
Ni	0.4	0.4	0.5
SO ₄ ²⁻	20,051	22,457	25,853
NH ₄ ⁺ (rebased to nitrogen)	36.0	49.5	60.3
Total water consumption, mln cubic meters	10.4	10	11.1
Total air pollutant emissions, t			
Ni	1.7	1.6	1.7
NH ₃	70	70	69
Waste generation, kt	16.5	7.0	5.5
Waste disposal, kt	15.7	0.8	0.8

Norilsk Nickel Nkomati

The company is required to comply with both national environmental regulations and Norilsk Nickel Group's corporate standards. Norilsk Nickel Nkomati pays close attention to environmental safety, is certified and regularly audited for compliance with ISO 14001.

The main reasons behind significantly lower consumption of fresh water in 2017 was the use of collected rain water. Waste generation reduced due to the disposal of industrial rubber items and scrap metals.

Environmental impact metrics of Norilsk Nickel Nkomati

Item	2015	2016	2017
Total water consumption, mln cubic meters	0.088	0.3327	0.0636
Waste generation, t	1,386	921	431
Waste disposal, t	634	1,611	845
Environmental expenditures, USD mln	0.57	0.42	0.27

Biodiversity conservation



2017 MILESTONES

Nornickel acquired 235,000 salmon fingerlings and released them into the Uмба River together with the Basin Authority for Fisheries and Conservation of Aquatic Biological Resources (Glavrybvod). By helping to recover the population of the Atlantic salmon, the Company makes up for its environmental impact. In addition to that, Nornickel provided assistance in releasing 316,000 sturgeon fingerlings into the Yenisei River. This was the largest project on releasing valuable fish species in the Company’s history.

As part of the Year of the Environment, Nornickel has signed the Cooperation Agreement with the Murmansk Region to support a number of projects in the nature park of the Rybachy and Sredny Peninsulas. The Company will allocate over RUB 7.5 mln to create nature trails and buy security equipment.

Zabaykalsky Krai Government and Nornickel signed the Cooperation Agreement to develop the Relict Oaks State Reserve located in the region. The amount of funding for the project stands at RUB 10 mln.



Cooperation with nature reserves

For over a decade now, Nornickel annually provided hundreds of millions of roubles to the nature reserves adjacent to the Company’s production facilities on the Taimyr and Kola Peninsulas for the purpose of preserving the unique Arctic environment.

This is in line with Nornickel’s strategy set to embrace green technologies in the next five years through a new investment cycle to secure sustainable development.

Kola MMC’s sites are only 10–15 km away from the Pasvik and the Lapland Nature Reserves (Murmansk Region). The Company’s Polar Division is located some 80–100 km away from the buffer zone of the Putoransky Reserve (Krasnoyarsk Territory).

Experts keep monitoring the environmental impact of Nornickel’s production sites on the nature reserves’ ecosystems. Long-term observation results show that environmental conditions are improving each year. “Scientists report growing populations of plants and animals along with the emergence of new species,” said Alexander Tyukin, head of Kola MMC’s R&D and Environmental Safety Department. – We have just discovered a rare plant species, a northern orchid that has not been seen since 2005. It speaks for itself.”



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