

The Group business

Mineral base

Nornickel boasts a unique mineral resource base due to its Tier 1 assets on Russia's Taimyr and Kola Peninsulas, in Zabaykalsky Krai. The continued expansion of the resource base secures the Company's long-term development.

RESERVES AND RESOURCES¹



Measured and indicated resources

2,220
mt

Ni
15.5 mt

Cu
23.8 mt

PGM
8.3 kt
(265.1 mln oz)

Proven and probable reserves

815
mt

Ni
7.1 mt

Cu
12.4 mt

PGM
3.9 kt
(125 mln oz)

Geography of metals produced by Norilsk Nickel

-  **Taimyr Peninsula**
Ni, Cu, Au, Pt, Pd, Rh, Ru, Os, Ur, Co
-  **Kola Peninsula**
Ni, Cu, Au, Pt, Pd, Rh, Ru, Os, Ur, Co
-  **Zabaykalsky Krai**
Cu, Au, Ag, Fe
-  **Australia**
Ni
-  **South Africa**
Ni, Cu, Co, Rh, Ru, Os, Ur, Pt, Pd

¹ The Company's reserves and resources as at 31 December 2017, including wholly owned overseas assets and excluding fields in Zabaykalsky Krai. Data regarding the mineral resources and ore reserves of the deposits of the Taimyr and Kola peninsulas were classified according to the Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC code), created by the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists, and the Minerals Council of Australia, subject to the terminology recommended by the Russian Code for Public Reporting of Exploration Results, Mineral Resources, Mineral Reserves (NAEN Code). The six platinum group metals (PGMs) are platinum, palladium, rhodium, ruthenium, osmium, and iridium.

Taimyr Peninsula (Polar Division and Medvezhy Ruchey)

Norilsk Nickel's Polar Division develops copper-nickel sulphide deposits at the Talnakhskoye and Oktyabrskoye Fields (the Talnakh Ore Cluster). Medvezhy Ruchey develops copper-nickel sulphide deposits at the Norilsk-1 Field (part of the Norilsk Ore Cluster).

The Company has a strong potential to maintain the high level of ore reserves given the significant mineral resources available within the existing mining operations. The depleted rich and cuprous

ore reserves at the existing mines are mainly replaced through inferred resources on the flanks of the fields under exploitation. The Company plans to ramp up its mining operations by tapping into new rich ore deposits and focusing on the gradual and active development of disseminated and cuprous ore horizons. The Company will leverage the approved projects to develop new deposits and horizons in the Talnakh Ore Cluster and promising geological exploration data to ensure a sustainable mineral resource base going forward.

Balance reserves of the Talnakh and Norilsk Ore²

2,160 mt

— Ni 15.8 mt
— Cu 30.4 mt
— PGM 10.7 kt

Proven and probable ore reserves

690 mt

— Ni 6.4 mt
— Cu 12.07 mt
— PGM 3.9 kt
(124.8 mln oz)

Measured and indicated mineral resources

1,714 mt

— Ni 12.0 mt
— Cu 22.7 mt
— PGM 8,2 kt
(over 264.2 mln oz)

Depletion of balance metal reserves

15.0 mt

Ni—250.5 kt, Cu—434.5 kt,
PGM—0.138 kt

Additional balance reserves³

5.4 mt

Average metal content
Ni—2.87%, Cu—7.02%, PGM—17.04 g/t

Kola Peninsula (Kola MMC)

Kola MMC develops copper-nickel sulphide deposits at the Zhdanovskoye, Zapolyarnoye, Tundrovoye, Kotselvaara-Kammikivi and Semiletka Fields as part of Pechenga ore fields. In addition to those,

Pechenga ore fields include the Sputnik, Bystrinskoye and Verkhneye Fields, and Kola MMC also holds an exploration and mining licence for them.

Balance reserves of Pechenga ore fields²

470.4 mt

— Ni 3.16 mt
— Cu 1.54 mt

Proven and probable ore reserves

125 mt

— Ni 0.7 mt
— Cu 0.36 mt

Measured and indicated mineral resources

333 mt

— Ni 2.3 mt
— Cu 1.1 mt

Depletion of balance metal reserves

6.86 mt

Ni—43.6 kt, Cu—18.7 kt

Conversion of balance reserves⁴

6.7 mt

average metal content
Ni—0.63%, Cu—0.27%

² Clusters (A + B + C₁ + C₂).

³ Operational and follow-up exploration, and re-estimation of reserves within the boundaries of the fields under exploitation.

⁴ Operational exploration.



Zabaykalsky Krai (GRK Bystrinskoye and Bugdainsky Mine)

Bystrinskoye Field

GRK Bystrinskoye develops deposits of gold-iron-copper ores at the Bystrinskoye Field.

Bugdainskoye Field

Bugdainsky Mine holds an exploration and mining licence for the Bugdainskoye Field.

The exploration of the field resulted in B + C₁ + C₂ mineral reserves entered into the government books in 2007. 2013 saw the launch of a development project at the Bugdainskoye Field in accordance with the duly approved design documents. In 2014, due to the low international molybdenum prices, the subsoil user suspended its right to develop the Bugdainskoye Field for three years. In 2017, the suspension of the right to develop the field was extended for another five years, until 31 December 2022.

Balance reserves of the Bystrinskoye Field (B + C₁ + C₂)



Balance reserves of the Bugdainskoye Field (B + C₁ + C₂)



¹ Magnetite iron.



Australia (Norilsk Nickel Cawse)

The Group holds a licence to develop the Honeymoon Well Project including:

- fields with disseminated nickel sulphide ores (Hannibals, Harrier, Corella and Harakka);
- the Wedgetail Field hosting solid and vein ores.

The total measured and indicated mineral resources of the Honeymoon Well Project are estimated at

173 mt of ore

Average nickel:
Ni — 0.68%

South Africa (Nkomati)

Nkomati is a 50/50 joint venture of the Norilsk Nickel Group and African Rainbow Minerals. Nkomati's performance is reflected in financial results using proportional consolidation according to our stake and not reflected in other totals.

The Nkomati disseminated copper-nickel sulphide ore deposit constitutes part of the Bushveld Complex. Nkomati is comprised of several ore

bodies, the key ones being a solid sulphide ore body (rich nickel ore) and the Main Mineral Zone (MMZ). The field also contains a Peridotite Chromite Mineralisation Zone (PCMZ) with a lower metal content vs MMZ.

The proven and probable ore reserves as at the end of 1H 2017

Proven average content and probable ore reserves²

88.6 mt of ore

Average content:
Ni — 0.31%
Cu — 0.11%
Co — 0.02%
PGM — 0.88 g/t

Measured and indicated mineral resources²

182.4 mt of ore

Average content:
Ni — 0.35%
Cu — 0.14%
Co — 0.02%
PGM — 0.95 g/t

² At the end of 1H 2017.

Geological exploration

Taimyr Peninsula (Polar Division)

Exploration and follow-up exploration of copper-nickel sulphide ores are underway at the Maslovskoye Field and deep horizons and flanks of the Oktyabrskoye and Talnakhskoye Fields pertaining to the Norilsk Industrial District. Exploration of the Mokulaevskoye Field's industrial limestone deposits has been completed.

Prospecting of sulphide ores in the Norilsk Industrial District is in progress on the western flank of the Oktyabrskoye Field and in the Lebyazhinskaya Area, 20 km north-west of Norilsk, as well as in the Razvedochnaya, Mogenskaya, Khalilskaya, Nizhne-Khalilskaya and Nirungdinskaya Areas, 150 km south-east of Norilsk.

Maslovskoye Field



The field is located in the Norilsk Industrial District, 12 km south of the Norilsk-1 Field.

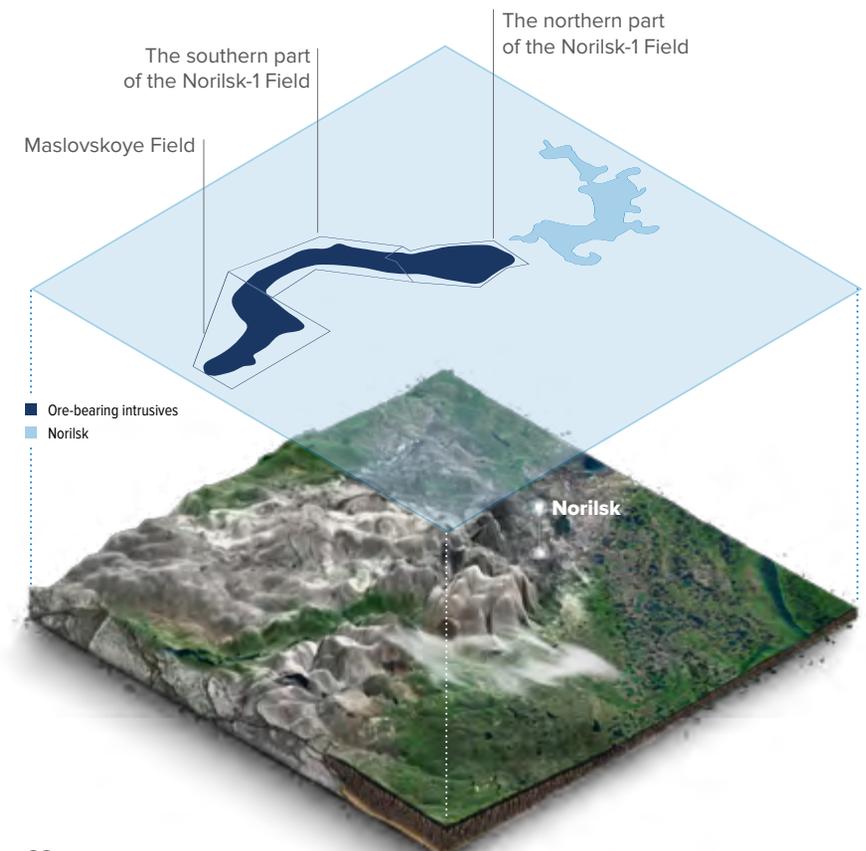
The Maslovskoye Field boasts some of the largest reserves in the world.

The licence to explore and mine copper-nickel sulphide ores at the Maslovskoye Field was obtained by the Company in 2015 following its discovery.

The Maslovskoye exploration project was reviewed and approved by the authorised expert bodies in 2016. A feasibility study of permanent exploratory standards is now in progress. In early February 2018, Nornickel and Russian Platinum signed a memorandum of intent to set up a joint venture for further development of disseminated ore deposits in the Norilsk Industrial District. The memorandum provides for the parity of JV partners, with Nornickel and Russian Platinum set to hold a 50% interest each. The partners' contributions to the authorised capital of the JV will come in the form of a licence to develop the Maslovskoye Field held by Nornickel and a licence to develop the southern part of the Norilsk-1 Field and the Chernogorskoye Field held by Russian Platinum.

Balance reserves of the Maslovskoye Field C₁ + C₂ mineral reserves

215 Ore, mt		Metal content in ore	
Pd	32,262 koz	Pd	4.56 g/t
Pt	12,479 koz	Pt	1.78 g/t
Ni	728 kt	Ni	0.33%
Cu	1,122 kt	Cu	0.51%
Co	34 kt	Co	0.016%
Au	1,304 koz	Au	0.19 g/t



Field boasts some of the largest reserves in the world.

Flanks and deep horizons of the Talnakhsky Ore



The Group’s geological exploration of the unregistered reserves at the Oktyabrskoye and Talnakhskoye Fields focuses on the follow-up exploration of rich and cuprous ores.

Geological exploration (follow-up exploration) is underway on the flanks of the Oktyabrskoye Field, southern flanks of the Talnakhskoye Field and the southern flank of Mayak mine to properly assess the boundaries of producing deposits and convert C₂ reserves to the C₁ category. Exploration on the eastern flanks of Skalisty mine and the flanks of the Severnaya 3 deposit has been completed. Following the re-assessment of the Severnaya 4 deposit copper and nickel ore reserves, 7,704.2 kt of rich and cuprous ores were entered in the government books.

In 2017, thanks to the follow-up exploration at the Severnaya 4 deposit, part of the Talnakh Ore Cluster, the Company registered additional balance reserves of copper-nickel ores.

Reserves of the Severnaya 4 deposit (Oktyabrskoye Field) were re-entered in the government books in 2017

Rich:

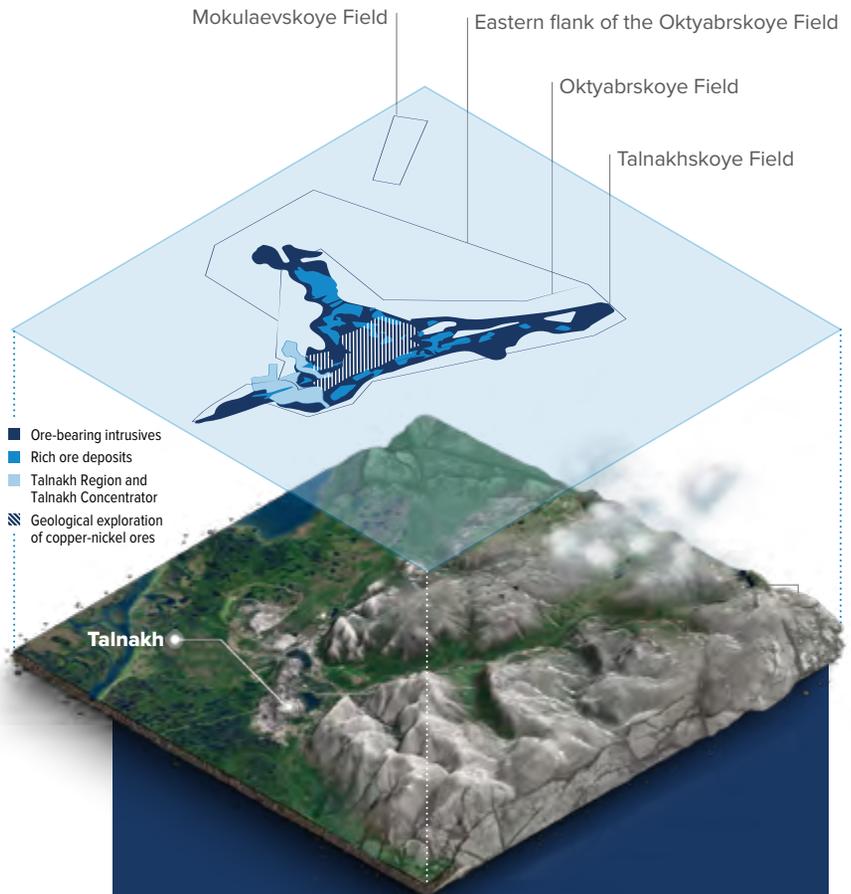
1.2 Ore, mt

- Ni 45.5 kt
- Cu 223.8 kt
- Pt 11.4 t
- Pd 33.9 t

Cuprous:

0.2 Ore, mt

- Ni 0.7 kt
- Cu 7.5 kt
- Pt 0.4 t
- Pd 1.5 t



GROWTH POINTS: TALNAKH OUTLOOK

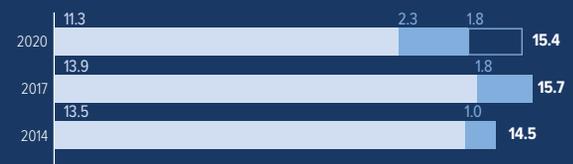
Maintaining a stable level of production at the Talnakh Ore Cluster is a mid-term priority of Norilisk Nickel’s new investment cycle launched in 2017 to secure The Company’s sustainable development.

In 2018–2020, the Talnakh mines are going to see investment of

USD 1.5 bn

Ore mining at the Talnakh cluster // mt

- Ore mining without additional investment
- Skalisty mine ramp-up
- Talnakh brownfields under construction



Company overview

Strategy overview

Market overview

Business overview

Corporate governance

Information for shareholders

Appendices

Prospecting and appraisal of new copper-nickel sulphide ore areas

In 2014, the Company obtained subsoil exploration licences for prospecting and appraisal of copper-nickel sulphide ore deposits in the Lebyazhninskaya, Razvedochnaya, Mogenskaya, Khalilskaya, Nizhne-Khalilskaya and Nirungdinskaya Areas of the Taimyrsky Dolgano-Nenetsky Municipal District (Krasnoyarsk Territory). The respective prospecting projects were reviewed and approved by the authorised expert bodies, with prospecting currently in progress, including exploration drilling to confirm anomalies identified earlier.

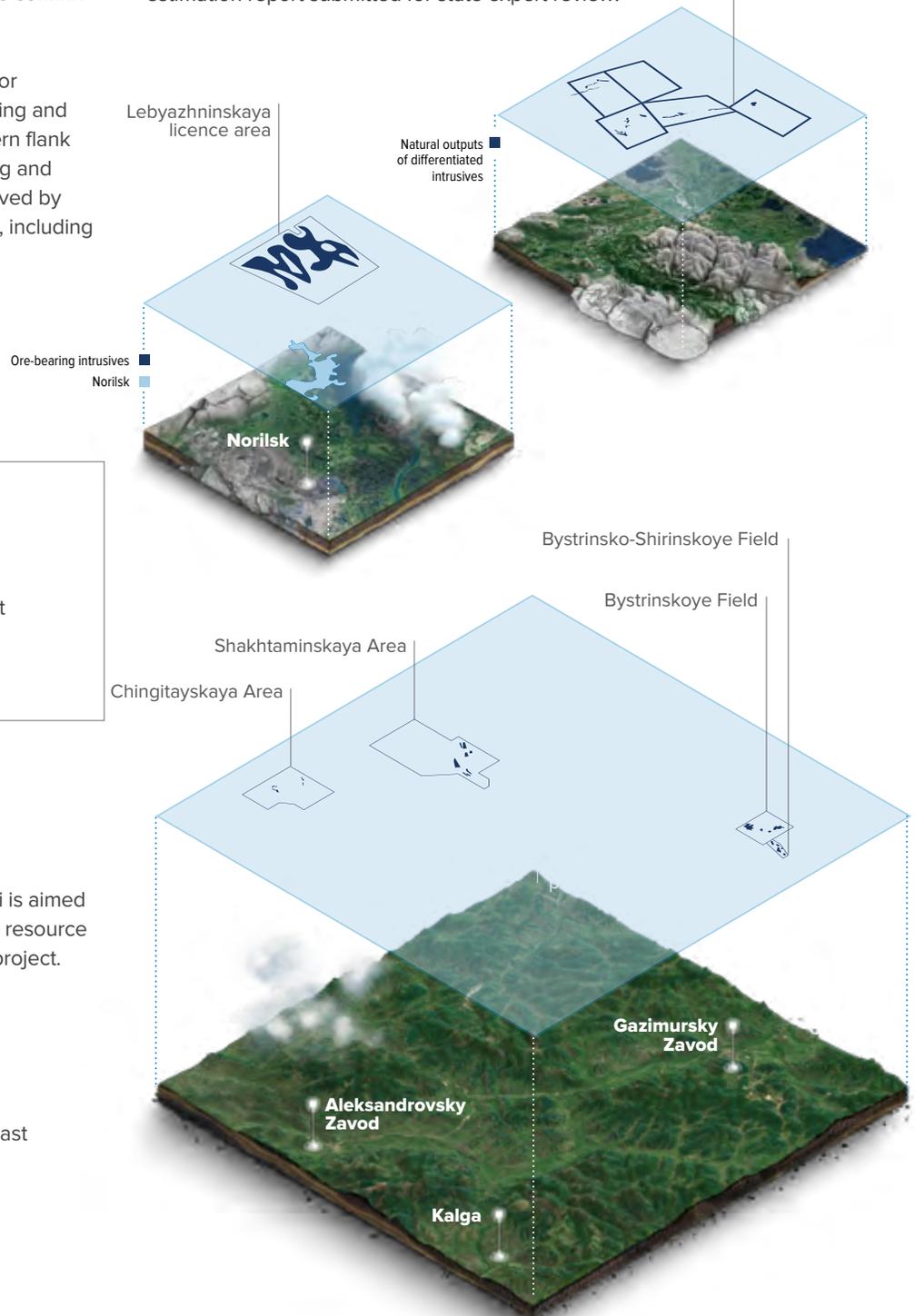
In 2017, the Company obtained a licence for geological exploration, including prospecting and appraisal of mineral deposits on the western flank of the Oktyabrskoye Field. The prospecting and appraisal project was reviewed and approved by the authorised expert bodies. Prospecting, including drilling, is now in progress.

Limestone exploration at the Mokulaevskoye Field

The field is located 10 km north and north-west of the industrial facilities of Oktyabrskiy and Taimyrskiy mines.

The licence to explore and mine limestone at the Mokulaevskoye Field was obtained in 2017 following its discovery. The Mokulaevskoye exploration project was reviewed and approved by the authorised expert bodies. The feasibility study of permanent exploratory standards has been completed, with the mineral reserves estimation report submitted for state expert review.

Razvedochnaya, Mogenskaya, Khalilskaya, Nizhne-Khalilskaya and Nirungdinskaya licence areas



Kola Peninsula (Kola MMC)

No geological exploration was carried out on the Kola Peninsula in 2017.

Zabaykalsky Krai (GRK Bystrinskoye)

Geological exploration in Zabaykalsky Krai is aimed at developing and maintaining the mineral resource base of both the Company and the Chita project.

Bystrinskoye Field



The Bystrinskoye Field is located 16 km east of Gazimursky Zavod settlement.

In 2015–2016, to increase the volume of development-ready reserves on the flanks and deep horizons of the field, the Company launched a follow-up exploration exercise, which resulted in discovery of additional reserves. In 2017, the identified skarn and gold ores were entered in the government books in 2017.

Bystrinsko-Shirinskoye Field



The Bystrinsko-Shirinskoye Field is located 24 km south-east of Gazimursky Zavod lying in immediate adjacency to the Bystrinskoye Field.

In 2017, the Company tested the in-situ chlorination technology at the field.

Zapadno-Shakhtaminskaya and Tsentralno-Shakhtaminskaya Areas



In 2015, the Company obtained a subsoil exploration licence to prospect for and appraise deposits of copper, gold, iron and associated minerals in the Zapadno-Shakhtaminskaya and Tsentralno-Shakhtaminskaya Areas.

These areas are located in the south-eastern part of Zabaykalsky Krai, 22 km away from the Borzaya – Gazimursky Zavod railway.

Increase in the Bystrinskoye Field reserves



In 2017, the Company completed additional geochemical and geophysical surveys and geological traverses, with a number of potential gold-copper mineralisation areas identified. Further prospecting is currently underway.

Chingitayskaya Area



In 2015, the Company obtained a subsoil exploration licence to prospect for and appraise deposits of copper, gold, molybdenum and associated minerals in the Chingitayskaya Area located 25 km north-west of Aleksandrovsky Zavod.

In 2016, the Company launched a comprehensive prospecting exercise in the area, including geochemical and geophysical surveys and geological traverses, which showed no potential for discovering an iron-copper-skarn field in the area. The prospecting was terminated, with the Company intending to surrender the licence in 2018.

Australia (Norilsk Nickel Caswe)

Honeymoon Well Development Project

In 2017, geological exploration under the Company's Australia licences focused on both the Honeymoon Well Nickel Project (Wedgetail, Hannibals, Harrier, Corella and Harakka Fields) and prospective Albion Downs North and Albion Downs South Areas.

Geophysical ground surveys were conducted at the Honeymoon Well Project.

The Wedgetail Field operations included the assessment of options for mining solid sulphide ores with subsequent third-party processing; drilling and geophysical surveys at a previously identified area of

potential sulphide nickel mineralisation on the field's flanks and in its deep horizons; and reinterpreting of the existing geological data to assess the potential of the field's deep horizons.

In 2017, the subsoil user suspended its right to develop the Wedgetail Field for five years, until 7 October 2021.

Desktop studies at the Hannibals Field were conducted to interpret geological data on tectonic zoning. In 2017, drilling operations at Albion Downs North and Albion Downs South were carried out to verify geophysical anomalies of nickel and copper identified earlier.

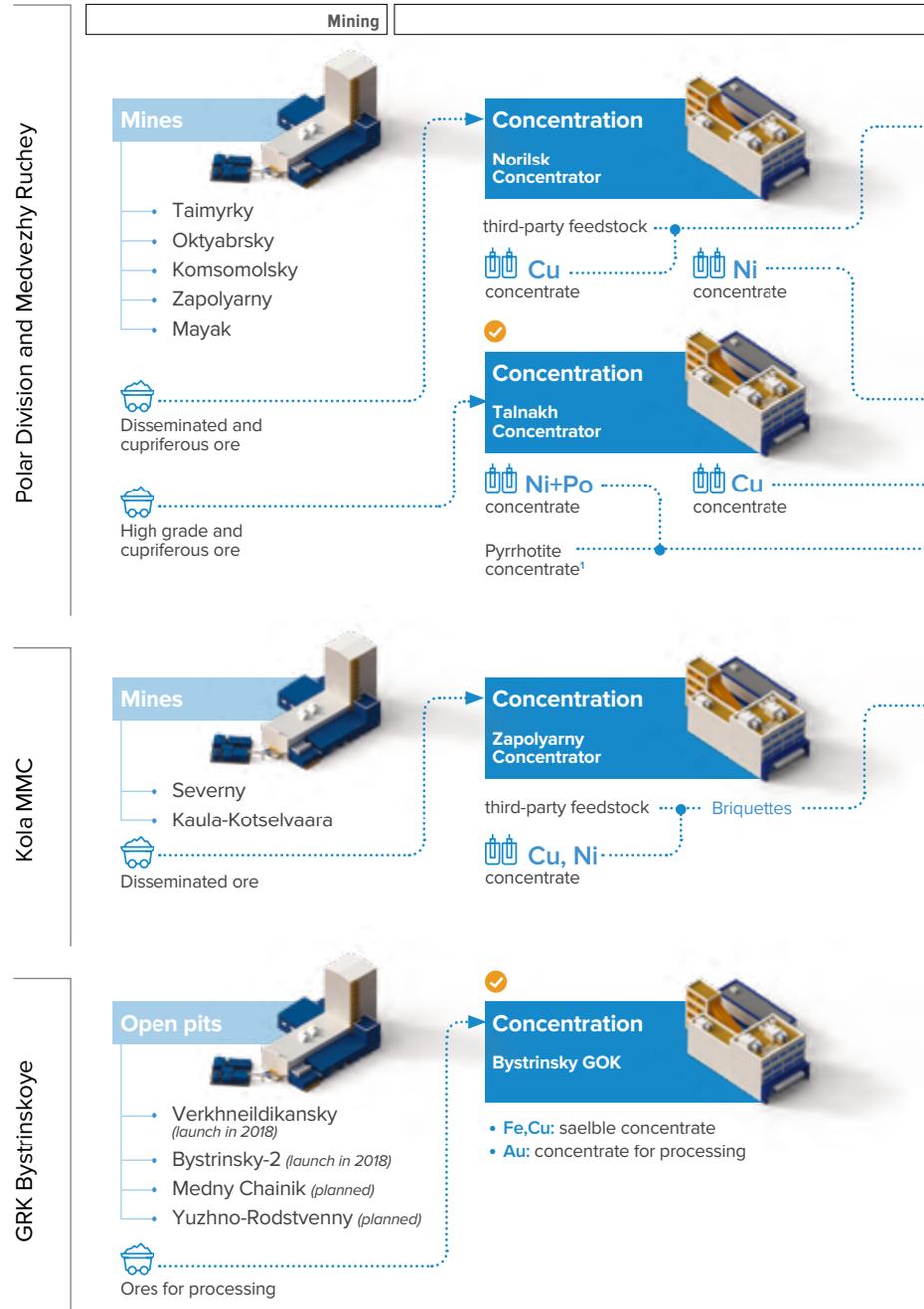
Production assets and activities

2017 MILESTONES

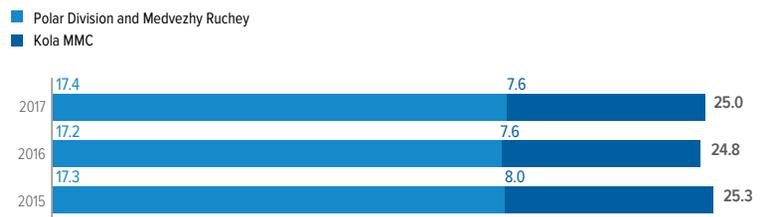
- ✓ Talnakh Concentrator reached the target operating rates set by the upgrade project. Its capacity increased by over 30% from 7.6 to 10.2 mtpa of ore. Metal losses in tailings were reduced, and target nickel and copper content in the collective concentrate and target quality of nickel-pyrrhotite and copper concentrates were met.
- ✓ A new tank-house section is being built at Kola MMC. Deployment of the highly efficient electrowinning technology will see the smelting of nickel anodes phased out. It will enable Nornickel to cut operating costs, drive down metal losses in the production process and improve the quality of products.
- ✓ In October, Bystrinsky GOK was launched in Zabaykalsky Krai, with hot commissioning progressing as scheduled. The facility will be developing the Bystrinskoye Field, a polymetallic deposit in the Gazimuro-Zavodsky District, and the Bugdainskoye Field, a molybdenum deposit in the Alexandrovo-Zavodsky District.

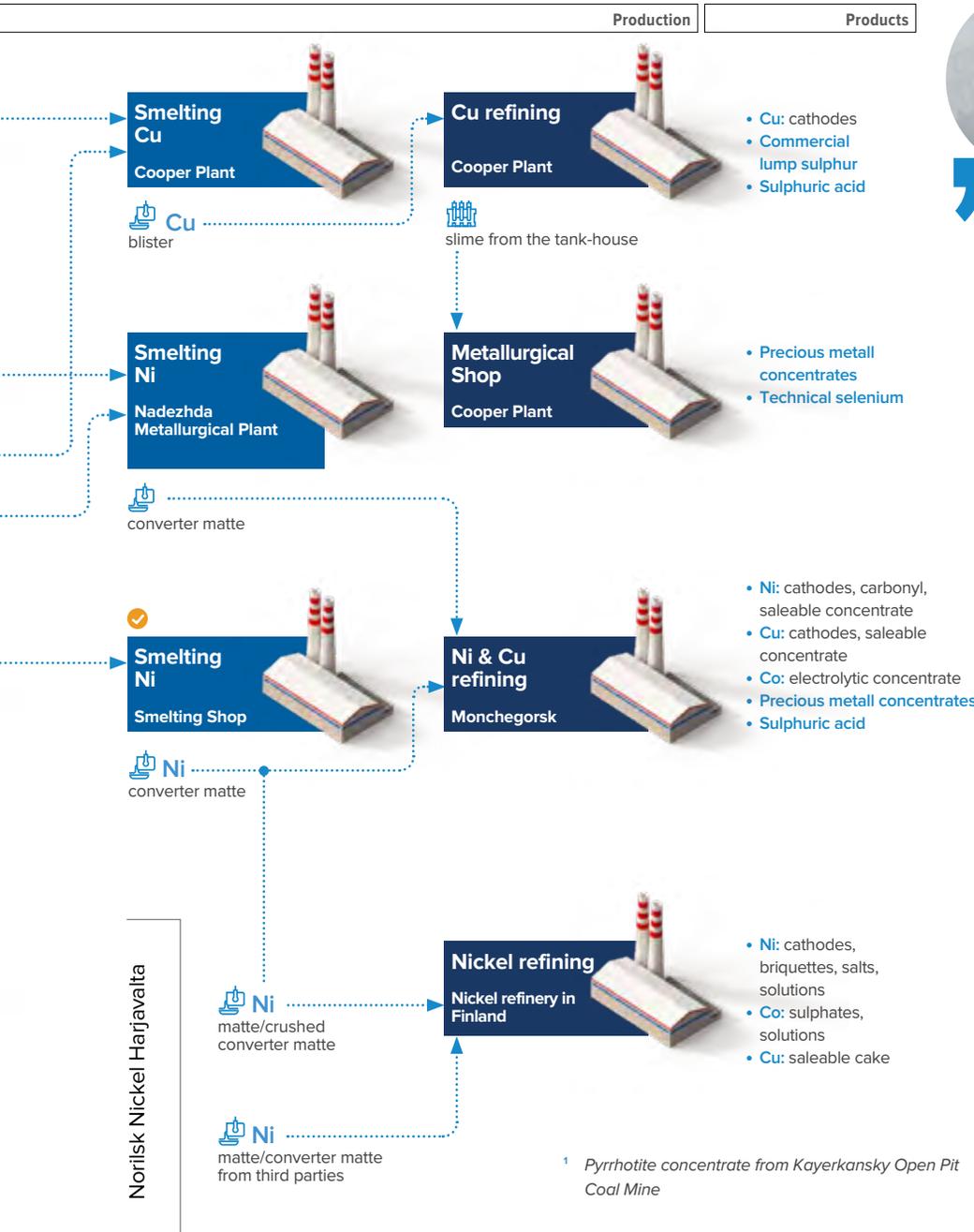
For more details, please see Key investment projects

[p. 87](#)



Ore mined across Russian assets // mt



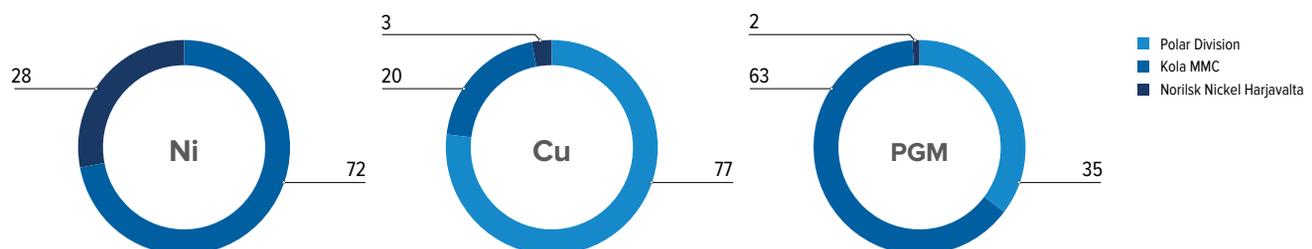


With the key stage of our reconfiguration effort completed, Talnakh Concentrator delivered stronger recovery rates and reached its design capacity while work-in-progress inventory levels normalised, allowing us to meet production targets for 2017. Our own feedstock metals production increased by 7–15% vs 2016, with copper and platinum output beating targets by 4% and 6%, respectively. In 2018, Kola MMC will adopt chlorine leaching, with the refining capacities upgrade and expansion entering the active phase. Copper production is also expected to increase during the year, driven by both Bystrinsky GOK and the existing capacities.”

Sergey Dyachenko

First Vice President – Chief Operating Officer at Nor nickel

Metals production in 2017 – breakdown by asset // % from the overall Group production



Operating performance for 2017

Ore mined across the Group // mt

Asset	2015	2016	2017
Russia			
Polar Division and Medvezhy Ruchey	17.3	17.2	17.4
Kola MMC	8.0	7.6	7.6
Total	25.3	24.8	25.0
South africa			
Nkomati (50%) ¹	4.2	2.8	3.5

Average metal content

Asset	Nickel, %			Copper, %			PGM ² , g/t		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Russia									
Polar Division and Medvezhy Ruchey	1.27	1.23	1.29	2.06	2.09	2.17	6.85	6.81	6.83
Kola MMC	0.62	0.53	0.54	0.25	0.22	0.23	0.07	0.08	0.07
South Africa									
Nkomati	0.34	0.36	0.31	0.14	0.13	0.12	–	–	–

Metals recovery in concentration // %

Asset	Nickel			Copper			PGM		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Russia									
Polar Division and Medvezhy Ruchey (ore to concentrate)	81.3	77.1	82.4	95.5	94.2	95.5	79.3	77.7	81.5
Kola MMC (ore to concentrate)	72.7	69.0	69.8	76.0	73.6	75.4	–	–	–
South Africa									
Nkomati (ore to concentrate)	74.1	70.6	70.7	86.1	89.5	90.9	–	–	–

¹ Volumes based on the 50% ownership (not included in the totals).

² The five following metals are included: palladium, platinum, rhodium, ruthenium and iridium.

Metals recovery in smelting // %

Asset	Nickel			Copper			PGM		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Russia									
Polar Division and Medvezhy Ruchey	93.1	93.4	93.9	94.2	94.1	94.0	93.8	95.0	95.6
Kola MMC (up to converter matte)	96.5	96.8	96.5	96.3	96.6	96.2	–	–	–
Kola MMC (in refining)	97.8	98.2	98.2	97.3	97.1	97.4	96.3	93.4	96.7
Finland									
Harjavalta	97.8	98.3	98.5	99.6	99.7	99.7	99.6	99.4	99.3

Saleable metals production across the Group

Metal	2015	2016	2017
Group total			
Nickel, t	266,406	235,749	217,112
from own Russian feed	220,675	196,809	210,131
Copper, t	369,425	360,217	401,081
from own Russian feed	352,766	344,482	397,774
Palladium, koz	2,689	2,618	2,780
from own Russian feed	2,575	2,526	2,728
Platinum, koz	656	644	670
from own Russian feed	610	610	650
Russia			
Nickel, t	222,016	182,095	157,396
Copper, t	355,706	350,619	387,640
Palladium, koz	2,606	2,554	2,738
Platinum, koz	622	622	660
Finland			
Nickel, t	43,479	53,654	59,716
Copper, t	13,048	9,598	13,441
Palladium, koz	78	64	42
Platinum, koz	33	22	10
South Africa³			
Nickel, t	11,350	8,486	8,006
Copper, t	5,301	4,007	4,504
Palladium, koz	53	40	46
Platinum, koz	20	15	20

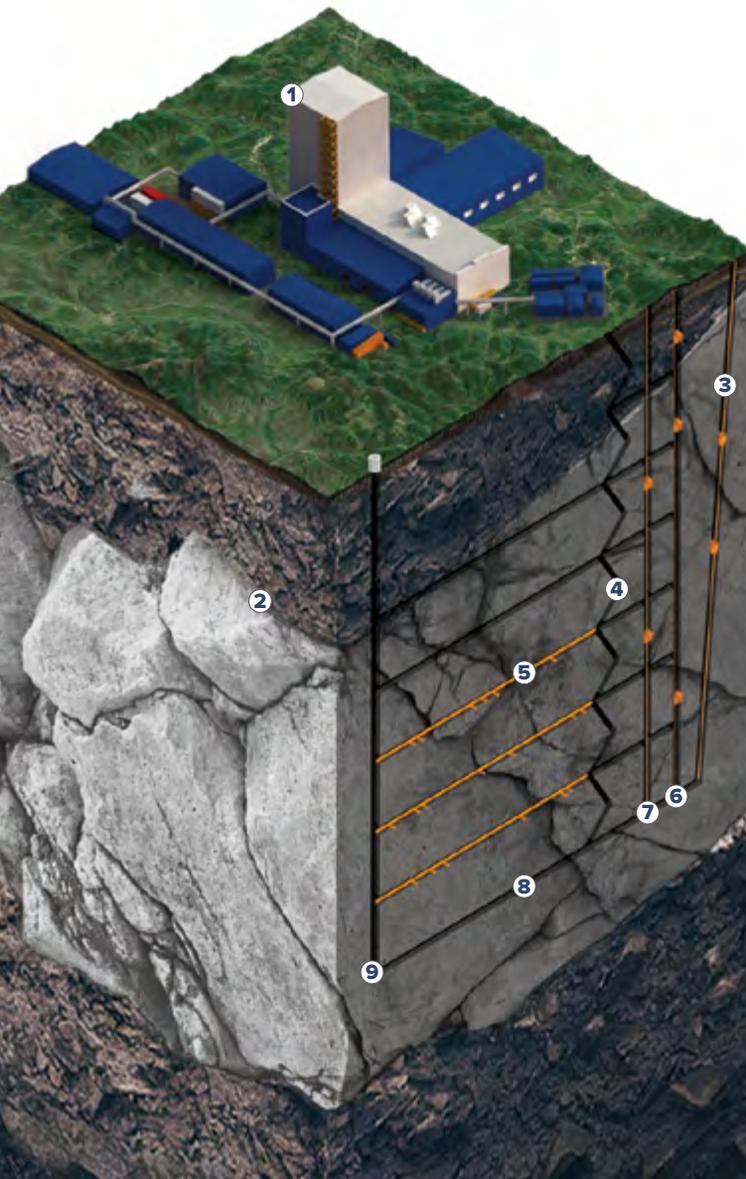
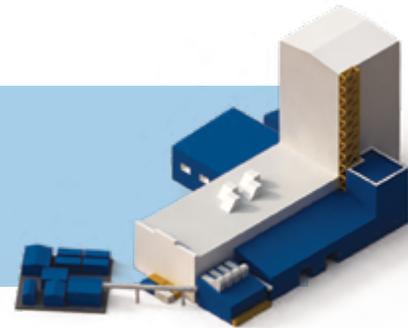
³ Saleable concentrate production based on the 50% ownership (not included in the totals).

Production chain

Mining

NEW TECHNOLOGIES

Automation and improvement of production processes, including through the introduction of simulation modelling for underground mining planning at Polar Division, helps boost output in the real-time mode and reduce costs.



Stripping

Provides access from the surface to the deposit through underground workings used to transport mined ore, people, etc.

Development workings

The deposit is divided into separate sections, including mining levels, blocks, sublevels, stoops, etc.

Stoping

- separation of ore from the rock;
- delivery of ore from the mine face to the haulage level;
- maintenance of the excavated area.

Rock mass removal

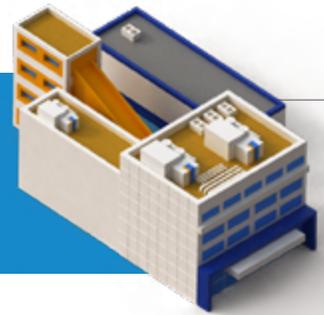
Ore is removed by load-haul dumpers and delivered to the surface by conveyor, railway and motor vehicles, or through skip shafts.



Ore to be transported to the concentrators

- ① Mine
- ② Ore body setting profile
- ③ Inclined shaft
- ④ Ramp
- ⑤ Crosscut
- ⑥ Skip shaft
- ⑦ Cage shaft
- ⑧ Haul roadway
- ⑨ Ventilation shaft

Concentration



✓ Ore dressing

● Crushing



● Screening



● Sizing



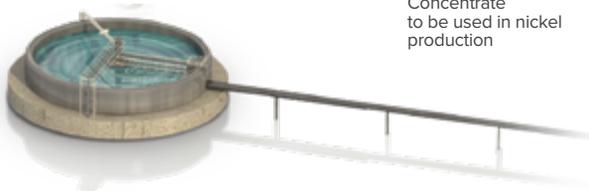
● Grinding



NEW TECHNOLOGIES

Briquetting of copper-nickel concentrate (mechanical pressing of feedstock with a binder material) replaced the obsolete pelletisation and roasting technology (using heat to remove significant portions of sulphur from the concentrate). The introduction of the new feedstock preparation technology helped substantially reduce sulphur dioxide emissions (by 35 -40 ktpa at Polar Division alone). As briquettes have a higher sulphur content than pellets, during conversion the smelting shop produces gases that are richer in sulphur dioxide and are therefore easier to capture and recycle.

Thickening

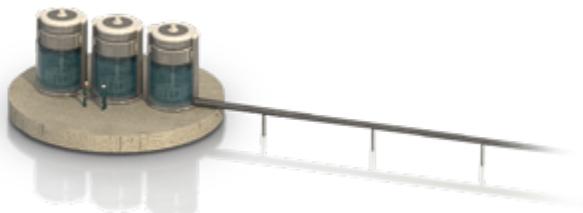


✓ **Cu**
Concentrate to be used in copper production

Ni
Concentrate to be used in nickel production

Tailings to be transported to the tailing dump

Flotation



Production chain (continued)

Nickel production



NEW TECHNOLOGIES

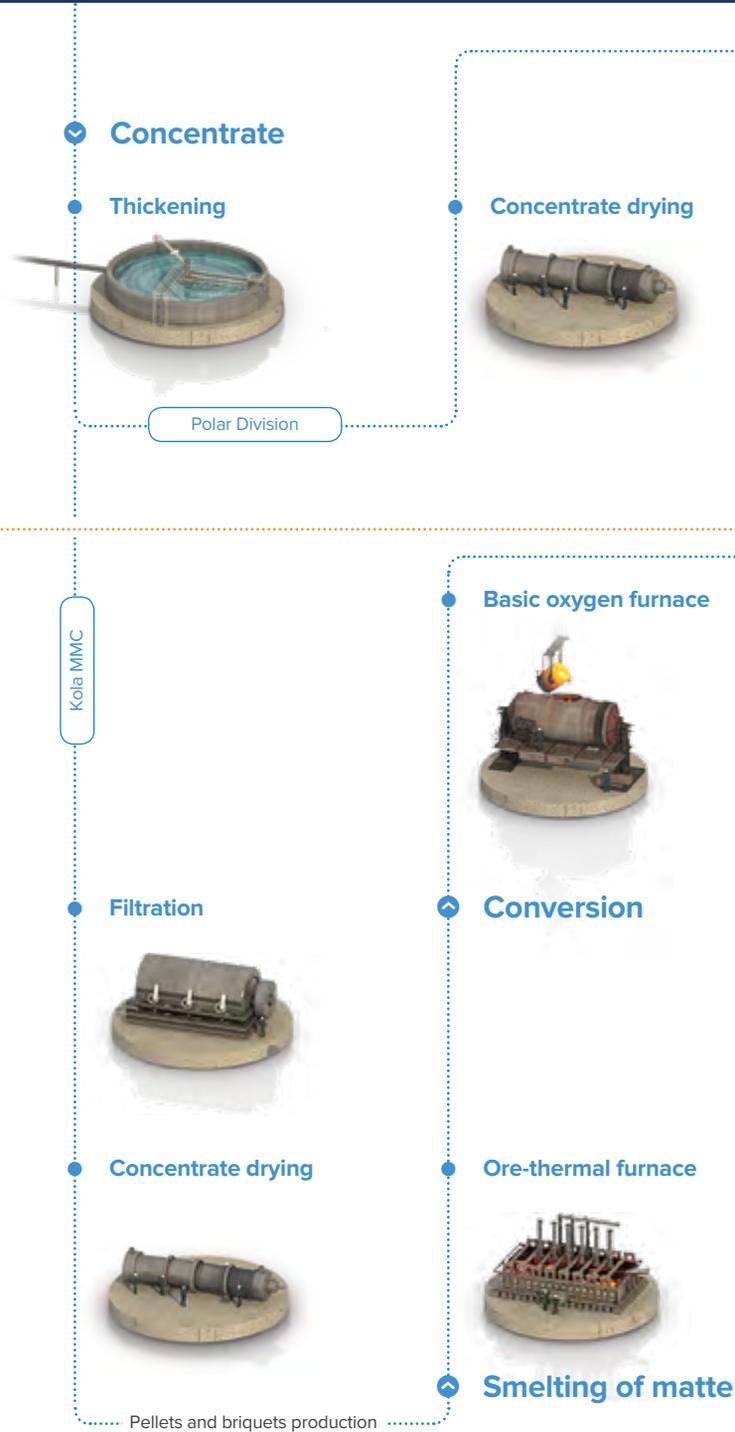
Saline effluent disposal process at the tank house

Saline effluent is a by-product of nickel refining operations that has to be disposed of. In Monchegorsk, the process is designed in the form of a closed cycle. The steam and condensate resulting from evaporation are then reused in the tank-house to heat solutions and operate heat exchangers.

The treatment facility for saline effluents also ensured a more advanced treatment of industrial discharges, with chemical agents, specifically boric acid, flowing back to the production circuit. Now, instead of having to deal with harmful waste, the Company produces additional saleable goods - sodium sulphate and chloride. Those are widely used by the chemical industry (production of synthetic detergents) and utility companies (as de-icing agents).

State-of-the-art electrowinning technology

The technology has been piloted at Kola MMC and is to be rolled out across the Group. Removal of the anode electric arc furnace from the production chain will help reduce emissions. Nickel powder produced in tube furnaces is used as the feedstock. This technology is less labour-intensive (the cells no longer need to be taken offline and cleaned after each loading cycle thanks to the use of insoluble anodes) and ensures zero losses of both precious and non-ferrous metals. On top of that, the resulting metal has maximum purity.





Company overview

Strategy overview

Market overview

Business overview

Corporate governance

Information for shareholders

Appendices

Matte smelting

Flash smelter



Matte

Conversion

Basic oxygen furnace



Preparation of high-grade matte

Casting mould



Cu, Ni
High-grade
matte to Kola MMC



Preparation of high-grade matte

Casting mould



Grinding



Separation of high-grade matte

Flotation



Anode electric furnace



Nickel melt

Anode smelting

Fluid-bed furnace



Nickel concentrate

Casting wheel



Electrolysis

Electrolysis baths



Nickel cathodes for sale



Pt, Pd, Au, Ag
Slime to be used in precious metals production



Copper concentrate to Copper shop



Nickel slime to Polar Division

Production chain (continued)

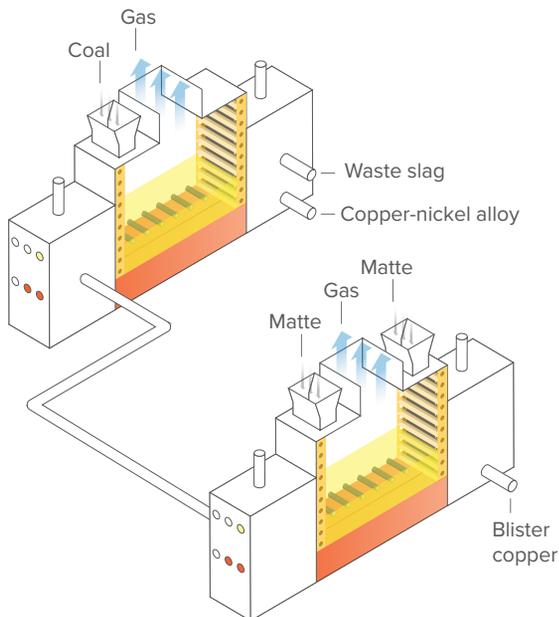
Copper production

Cu

NEW TECHNOLOGIES

Continuous converting technology

The technology is being rolled out at NMP's continuous copper matte converting facility (as part of two Vanyukov furnaces – the basic oxygen and slag cleaning ones) to improve its blister copper production cycle. The new process uses a cutting-edge technology to dispose of smelting gases, with sulphur being taken into a continuous stream of highly concentrated gases ready for disposal.



This technology will help reduce sulphur-rich gas emissions by at least

30%

Concentrate

Thickening



Filtration



Concentrate drying



Smelting of matte

Reverberatory furnace



Copper matte

Copper matte



Slug to dump

Vanyukov furnace



Kola MMC

Polar Division



Company overview

Strategy overview

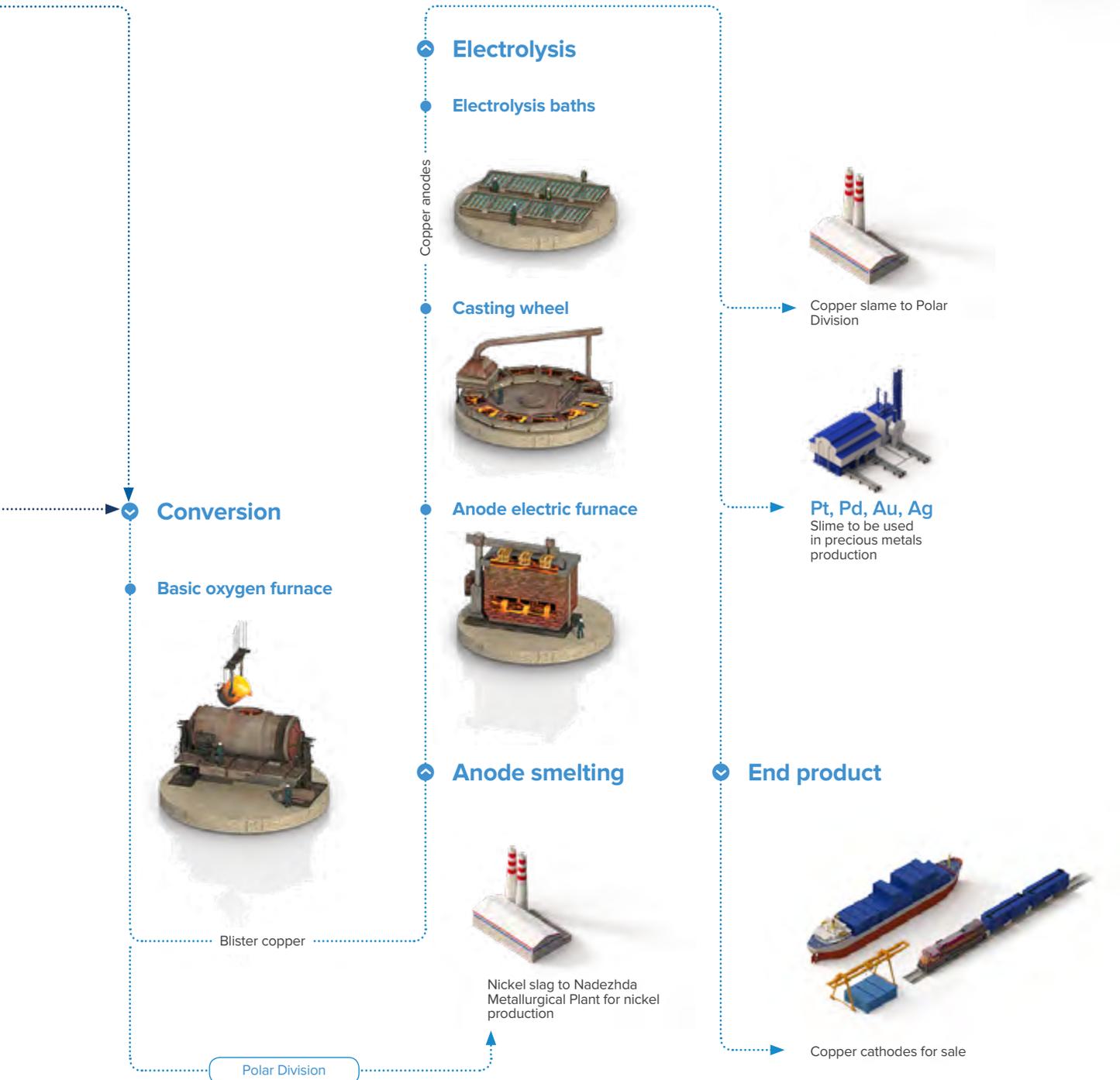
Market overview

Business overview

Corporate governance

Information for shareholders

Appendices



Taimyr Peninsula (Polar Division and Medvezhy Ruchey)

2017 MILESTONE

In 2H 2017, Nornickel established Medvezhy Ruchey, a subsidiary that operates part of the assets of Polar Division, including Zapolyarny mine, Norilsk Concentrator, tailings pit No. 1 and Lebyazhye tailing pit. The carve-out was done to create separate Talnakh and Medvezhy Ruchey sites with a view to ramping up the new unit's capacities by raising investments.



Polar Division and Medvezhy Ruchey are the Group's flagship subsidiaries featuring a full metals production cycle that embraces operations ranging from ore mining to the shipment of end products to customers. Operating the Company's largest fields, they mine ca. 17 mtpa of ore. In 2017, Polar Division and Medvezhy Ruchey accounted for 77% and 35% of copper and PGM output, respectively.

They are located beyond the Arctic Circle on the Taimyr Peninsula in the north of the Krasnoyarsk Territory, Russia. The sites are linked to other regions by the Yenisei River, the Northern Sea Route and by air.

The Talnakhskoye and Oktyabrskoye Fields are developed by Taimyrsky, Oktyabrsky, Komsomolsky (including Komsomolskaya and Skalistaya mines) and Mayak mines. Ores are extracted through slicing and chamber mining with flowable backfilling.

The Norilsk-1 Field is developed by Zapolyarny mine through open-pit and underground mining. Underground mining is carried out through level caving using single-stage excavation and front ore passes.

Mining

Mining facilities

Field/mine	Mine type	Ores ¹
Oktyabrskoye Field copper-nickel sulphide		
Oktyabrsky mine	underground	high grade, cupriferous and disseminated
Taimyrsky mine	underground	high grade
Talnakhskoye Field copper-nickel sulphide		
Komsomolsky mine ^{2,3} , including		
Komsomolskaya mine ⁴	underground	cupriferous and disseminated
Skalistaya mine	underground	high grade
Mayak mine ⁵	underground	high grade and disseminated
Norilsk-1 Field copper-nickel sulphide		
Zapolyarny mine ⁶ , including		
Zapolyarny open pit	open pit	disseminated
Zapolyarnaya mine	underground	disseminated

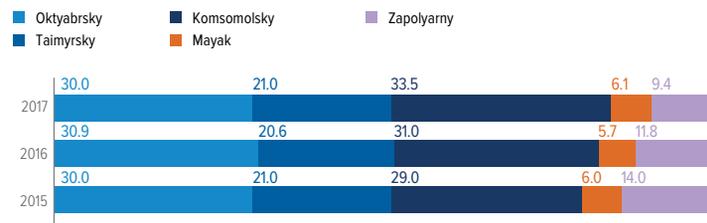
- ¹ High grade ores are characterised by a higher content of non-ferrous and precious metals; cupriferous ores are characterised by a higher copper content vs nickel; disseminated ores are characterised by a lower metal content.
- ² In 2010, the Talnakh Mining Administration was transformed into Komsomolsky mine consisting of Komsomolskaya, Skalistaya and Mayak mines.
- ³ In 2015, Mayak mine was spun off from Komsomolsky mine (consisting of Komsomolskaya, Skalistaya and Mayak mines) to become an independent operation. Komsomolsky mine was left with Komsomolskaya and Skalistaya mines.
- ⁴ Komsomolskaya mine is responsible for the development of the Talnakhskoye Field and the eastern part of the Oktyabrskoye Field.
- ⁵ In 2013–2014, part of Komsomolsky mine.
- ⁶ In 2010, the Norilsk-1 Mining Administration was transformed into Zapolyarny mine. Medvezhy Ruchey mine was integrated into Zapolyarny mine as Zapolyarny open pit. On 14 July 2017, Zapolyarny mine became a standalone unit of Medvezhy Ruchey.

Ore mined // t

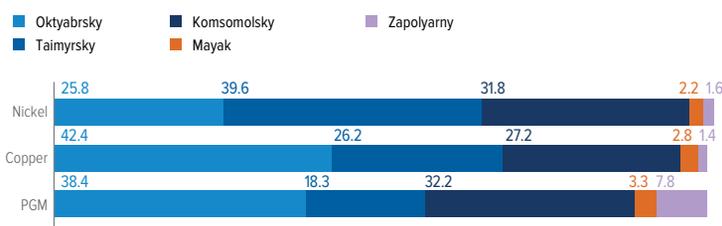
Ore type	2015	2016	2017
High grade	6,541,541	6,191,831	6,593,208
Cupriferous	5,403,755	7,080,627	7,165,500
Disseminated	5,382,273	3,971,752	3,618,576
TOTAL	17,327,569	17,244,210	17,377,284

In 2017, Polar Division's total ore output stood at 17.4 mt, up 133 kt, or 0.8% y-o-y. The production of high grade and cupriferous ores increased by 6.5% and 1.2% y-o-y, respectively, driven by the performance of Taimyrsky mine and Skalistaya mine demonstrating a 40% growth y-o-y. Cupriferous ore production was higher thanks to Oktyabrsky mine's results. In 2017, disseminated ore production was down by 9% – primarily due to lower output at Zapolyarny mine. The change in the volumes of ore mined was in line with the annual production plan.

Ore mined – breakdown by mine // %



Ore mined – breakdown by metal // %



+0.8%

17.4 mt

Polar Division and Medvezhy Ruchey total ore output in 2017

 **Concentration**

Concentration facilities

- Talnakh Concentrator
- Norilsk Concentrator (now part of Medvezhy Ruchey)

Talnakh Concentrator processes high grade and cupriferous ores from the Oktyabrskoye Field to produce nickel-pyrrhotite and copper concentrates and metal bearing products. The key processing stages include crushing, breaking, flotation and thickening.

Norilsk Concentrator processes cupriferous and all disseminated ores from the Talnakhskiye and Oktyabrskoye Fields and Copper Plant’s low grade ores to produce nickel and copper concentrates. The key processing stages include crushing, breaking, gravitation and flotation enrichment, and thickening.

Thickened concentrates are transported via a pipeline from Talnakh and Norilsk Concentrators to smelting facilities for further processing.

In 2017, Polar Division’s Production Association of Concentrators processed a total of 18 mt of feedstock (including high grade, cupriferous and disseminated ores).

18.0 mt

of feedstock (including high grade, cupriferous and disseminated ores) was processed by Polar Division’s Production Association of Concentrators in 2017

In 1H 2017, Talnakh Concentrator operated against the backdrop of implementing and fine-tuning a new technology, moving on to reach the design capacity in 2H 2017 and beat the 2016 ores processing volume by 1.5 mt in the full year (10.0 mt vs 8.6 mt). Nickel recovered into collective flotation concentrate from ore processed increased by 2.2% y-o-y (81.7% vs 79.5%).

In 2017, volumes of ore processed at Norilsk Concentrator were 0.6 mt lower (7.5 mt vs 8.1 mt in 2016) – in line with the mining plan. Nickel recovered into collective concentrate was 0.8% higher (71.7% vs 70.9% in 2016). During the year, the facility processed significant volumes of Copper Plant’s low grade ores.

Talnakh Concentrator

Sulphide ore processed // mt



Nickel recovery // %



Norilsk Concentrator

Sulphide ore processed // mt



Nickel recovery // %



¹ In 2017, volumes of ore processed decreased in line with the mining plan.

 **Smelting**

Smelting facilities

- Nadezhda Metallurgical Plant
- Copper Plant (CP)
- PGM Concentrator (part of Copper Plant)

Nadezhda Metallurgical Plant produces converter matte and elemental sulphur from the following:

- Talnakh Concentrator’s nickel-pyrrhotite concentrate and metal bearing products;
- Norilsk Concentrator’s nickel concentrate;
- pyrrhotite concentrate previously stored at Kayerkansky Open Pit Coal Mine (KUR-1).

Pyrrhotite concentrate from Talnakh Concentrator and stored pyrrhotite concentrate from Kayerkansky Open Pit Coal Mine is further leached in Hydrometallurgical Shop to produce steam cured sulphide concentrate. Concentrate from Talnakh Concentrator, steam cured sulphide concentrate and stored pyrrhotite concentrate from Kayerkansky Open Pit Coal Mine are delivered to the flash smelting furnaces. The matte is then blown into high grade converter matte.

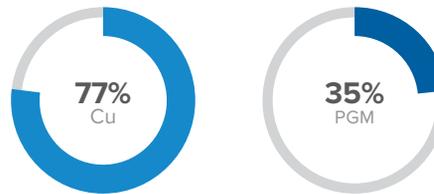
Copper Plant processed all of the copper concentrate from Norilsk and Talnakh Concentrators, as well as third-party feedstock, to obtain copper cathodes, elemental sulphur and sulphuric acid for production needs of Polar Division.

PGM Concentrator (part of Copper Plant) recycles sludge from the tank-house to produce concentrates of precious metals and technical selenium.

Precious metals produced by Polar Division are refined at Krasnoyarsk Precious Metals Refinery under a tolling agreement.

At Polar Division, metals are produced from its own feedstock. Since Q4 2016, all nickel converter matte from Nadezhda Metallurgical Plant has been processed at Kola MMC due to the Nickel Plant shutdown.

In 2017, Polar Division and Medvezhy Ruchey accounted for¹:



¹ % from the overall Group production.

Metals output

Metal	2015	2016	2017
Nickel, t	96,916	50,860	0
Copper, t	292,632	280,347	306,859
Palladium, koz	1,935	1,703	956
Platinum, koz	488	449	259

Product offering:



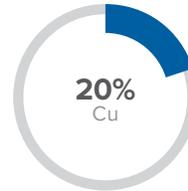
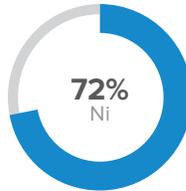
- copper cathodes;
- nickel converter matte for Kola MMC;
- precious metal concentrate;
- commercial lump sulphur;
- technical selenium.

Kola Peninsula (Kola MMC)

Kola Mining and Metallurgical Company (Kola MMC) is Norilsk Nickel's 100% subsidiary and an important production asset.

Located on the Kola Peninsula in Russia's Murmansk Region, Kola MMC is fully integrated into the transport infrastructure of the Northwestern Federal District.

In 2017, Kola MMC accounted for¹:



¹ % from the overall Group production.



Mining

Mining assets

Field / mine (section)	Mine type	Ores
Zhdanovskoye Field		Copper-nickel sulphide
Severny underground section	Underground	Disseminated
Zapolyarnoye Field		Copper-nickel sulphide
Severny underground section	Underground	Disseminated
Kotselvaara and Semiletka Fields		Copper-nickel sulphide
Kaula-Kotselvaara mine ²	Underground	Disseminated

Ore mined // t

Ore type	2015	2016	2017
Disseminated	7,962,226	7,615,518	7,643,224

² In December 2013, Kaula-Kotselvaara mine was merged with Severny mine and incorporated therein.

Kola MMC is currently developing the Zhdanovskoye, Zapolyarnoye, Kotselvaara and Semiletka Fields.

Severnny mine (including Kaula-Kotselvaara mine) produces disseminated sulphide ores containing nickel, copper and other saleable components.

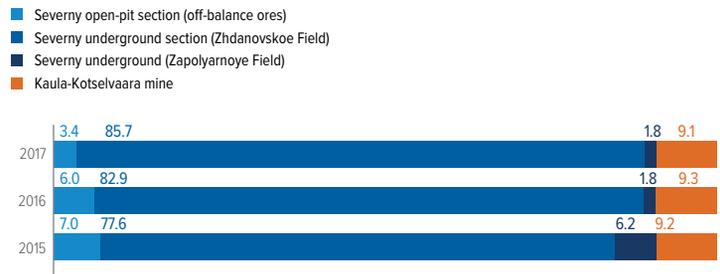
Severnny mine leverages various ore mining methods:

- the Zhdanovskoye Field uses sublevel longwall caving with front ore passes, block caving (limited scope of application), and open-pit mining (at Yuzhny open pit) methods;
- the Kotselvaara and Semiletka Fields primarily use stoping from sublevel drifts and sublevel caving, as well as room-and-pillar short-hole and long-hole stoping (limited scope of application).

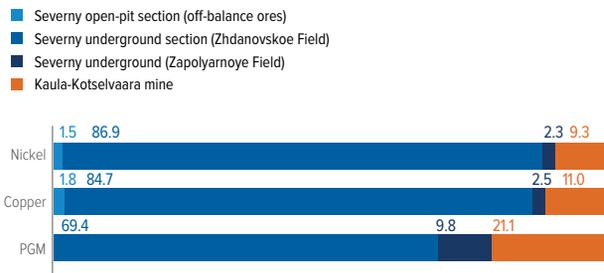
Kola MMC's total ore output amounted to 7.6 mt, up 0.4% (28 kt) y-o-y owing to the development of flank deposits at the Zhdanovskoye Field.

The change in the volumes of ore mined was in line with the annual production plan.

Breakdown of ore production at Severnny mine // %



Ore production at Severnny mine in 2017 – breakdown by metals // %



+0.4%

7.6 mt

Kola MMC's total ore output in 2017

Concentration

Concentration facilities

- Zapolyarny Concentrator

The Concentrator produces briquetted copper-nickel concentrate. Nkomati concentrate also undergoes briquetting. Briquettes are delivered to the Smelting Shop to produce converter matte.

In 2017, Kola MMC's Concentrator processed 7,600 mt of ore, up 32 kt y-o-y.

In 2017, the rate of metals recovery in bulk concentrate was above the 2016 level due to a lower content of hard-to-process and talcose ores in the ore mixture.

Smelting

Smelting facilities:

- Smelting Shop (Nickel)
- Briquetting section (Zapolyarny)
- PGM Concentrator (Monchegorsk)
- Refining Shop (Monchegorsk)
- Tank-Houses 1 and 2 (Monchegorsk)

In 2017, Kola MMC continued improving production processes and proceeded with the maintenance of key production equipment at its smelting facilities.

In Q1 2017, it commissioned a disposal facility for saline effluent from nickel refining operations at Tank-House 2. Tank-House 2 saw further implementation of the project for Nickel Electrowinning from Chlorine

Dissolved Tube Furnace Nickel Powder with the Production Volume of 145 ktpa of Electrolytic Nickel.

Kola MMC's refining facilities in Monchegorsk process converter matte from Nickel's Smelting Shop and Polar Division.

Precious metals produced by Kola MMC are refined at Krasnoyarsk Precious Metals Refinery under a tolling agreement.

In 2017, Kola MMC achieved a higher metal output compared to 2016. The growth was primarily driven by larger converter matte supplies from Polar Division after production reconfiguration.

Product offering:



- nickel cathodes;
- carbonyl nickel;
- saleable nickel concentrate;
- copper cathodes;
- electrolytic cobalt;
- cobalt concentrate;
- precious metal concentrates;
- sulphuric acid;
- crushed converter matte for Harjavalta;
- saleable copper concentrate.

Metals output

Metal	2015	2016	2017
Nickel, t	125,100	131,235	157,396
including from the Company's Russian feedstock	123,335	126,937	155,110
Copper, t	63,075	70,272	80,781
including from the Company's Russian feedstock	60,134	63,542	78,586
Palladium, koz	671	851	1,782
including from the Company's Russian feedstock	640	815	1,731
Platinum, koz	134	173	401
including from the Company's Russian feedstock	122	159	385

2-fold

In 2017, palladium and platinum output increased in Kola MMC

+20%

Increased nickel production in Kola MMC in 2017

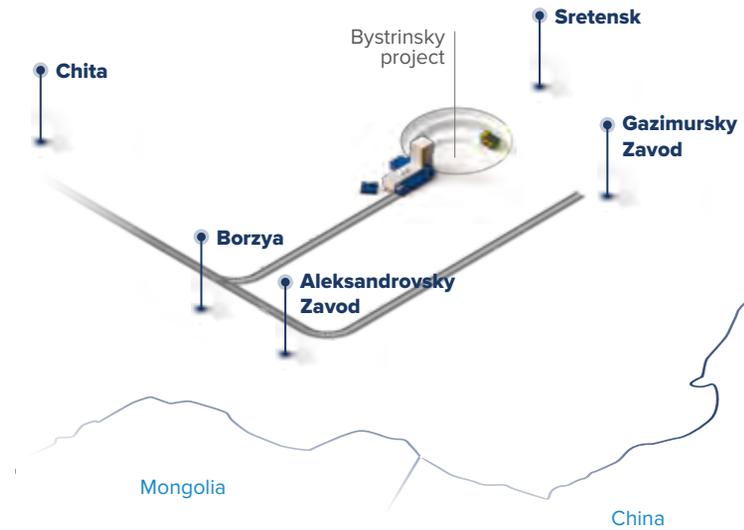
+15%

Increased copper production in Kola MMC in 2017

Zabaykalsky Krai (GRK Bystrinskoye)

GRK Bystrinskoye (Bystrinsky GOK) is the Company's 50.01% subsidiary.

This new Nornickel project is the largest in the metals industry in Russia, as its operations include ore mining, concentration and shipment of end products to customers. The volume of ore mined and processed is expected to exceed 10.0 mtpa.



The construction of Bystrinsky GOK started in 2013. In October 2017, the Company embarked on the pre-commissioning phase. The facility is expected to switch to normal operation by the end of 2018 reaching its design capacity after 2021.

Bystrinsky GOK is located in the Gazimuro-Zavodsky District of Zabaykalsky Krai, south-east of Gazimursky Zavod in the Ildikan valley (350

km from Chita). The closest residential areas are Novoshirokinsky, 14 km north-east of the facility, and Gazimursky Zavod, a district capital 25 km to the north-west.

The Naryn – Gazimursky Zavod rail line was built to facilitate mining in the south-east of Zabaykalsky Krai. In 2012, the railway became operational, allowing traffic to Gazimursky Zavod.

Mining

Mining facilities

Field/mine	Mine type	Ores
Bystrinskoye Field		Gold-copper-iron
Verkhneildikansky open-pit mine	Open pit	Gold-copper-iron
Bystrinsky-2 open-pit mine	Open pit	
Medny Chainik open pit mine	Open pit	
Yuzhno-Rodstvenny open pit mine	Open pit	

Bystrinsky GOK leverages the vast copper, gold and iron ore reserves of the Bystrinskoye Field.

333 mt
ore reserves at the Bystrinskoye Field

10 mtpa
Bystrinsky GOK's planned ore processing capacity

 **Concentration**

Concentration facilities

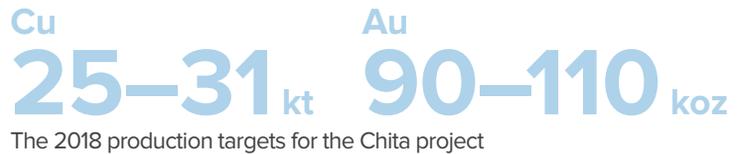
- Concentrator

The construction began in 2015. The Concentrator is intended to process rich and cupriferous ores of the Bystrinskoye Field to produce copper, magnetite, and gold concentrates. The key processing stages include crushing, grinding, flotation, thickening, filtration and packaging.

The Concentrator is designed to have two separate processing streams. The first stream is now at the pre-commissioning stage. Its launch will enable the facility to reach 50% of its design capacity.

In 2018, the second stream will be commissioned for the Concentrator to unlock its full design capacity.

Copper concentrate is expected to be exported to China, while magnetite and gold concentrates will be delivered to the Company’s other facilities for further processing.



Product offering:

- copper concentrate;
- gold concentrate;
- magnetite concentrate;
- silver.



Finland (Norilsk Nickel Harjavalta)

Norilsk Nickel Harjavalta became part of the Group in 2007. It focuses on processing the Company's Russian feedstock and nickel-bearing raw materials sourced from third-party suppliers.

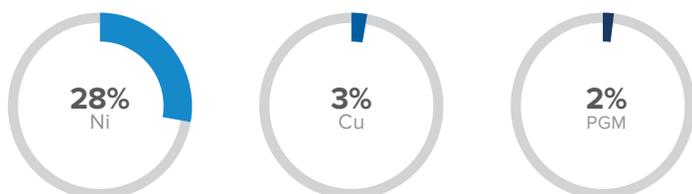
Norilsk Nickel Harjavalta has a total nickel processing capacity of 66 ktpa.

The facility uses sulphuric acid leaching, the world best-in-industry solution with the metal recovery rates of above 98%.

Founded in 1960, Harjavalta is the only nickel refinery in Finland and one of the largest similar facilities in Europe.

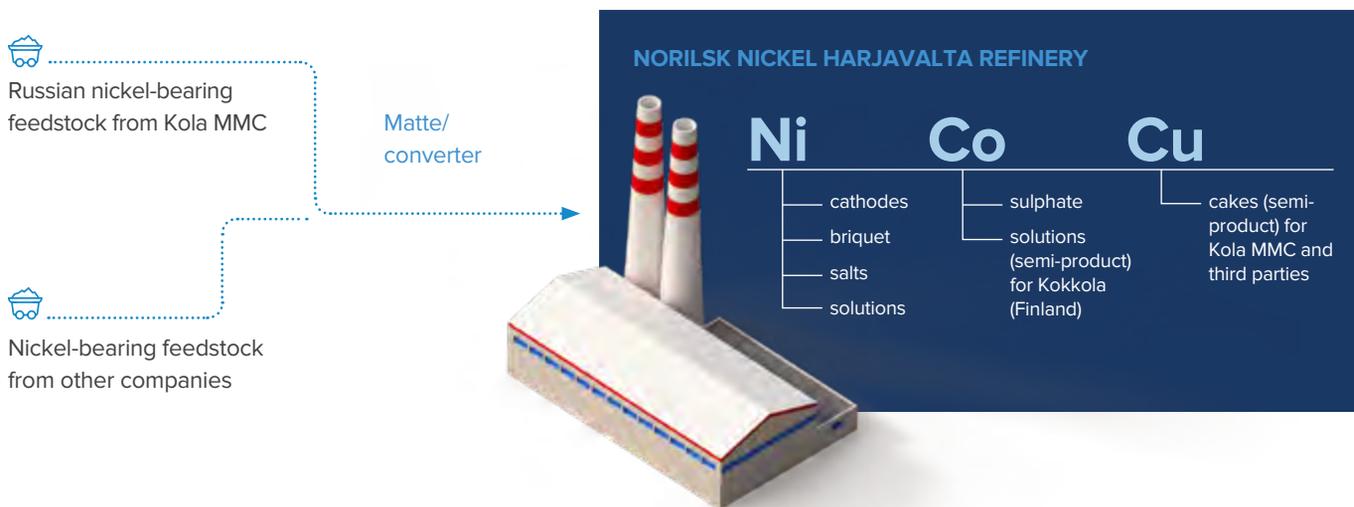


In 2017 Harjavalta accounted for¹



¹ % from the overall Group production.

Process flowsheet of Norilsk Nickel Harjavalta



In Q2 2017, the refining facilities in Monchegorsk (Russia) started to gradually increase their nickel feedstock supplies to Harjavalta in line with the nickel production reconfiguration strategy. Third-party feedstock supplies included matte and converter matte from Boliden Harjavalta (Finland) (sourced in Q1 only) and nickel salts from other companies (sourced throughout 2017).

Nickel and copper recovery rates improved on the back of a drop in losses of nickel and copper with ferrous cakes.

In 2017, Norilsk Nickel Harjavalta produced 59.7 kt of saleable nickel, up 11% y-o-y. The growth was driven by the reconfiguration of refining facilities and increased nickel feedstock supplies from Kola MMC.

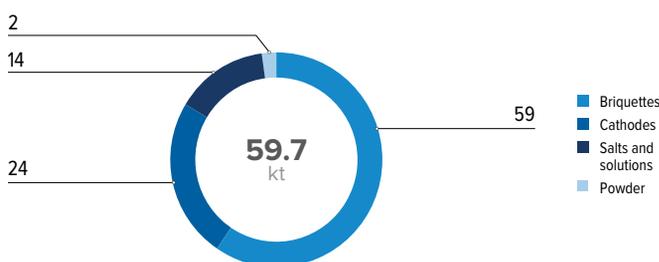
The third party sales of copper in copper cake totalled 13.4 kt, up 40% y-o-y. This was mainly due to the increased processing of Russian feedstock under the production reconfiguration programme.

The production of saleable palladium and platinum in copper cake dropped by 34% and 55% y-o-y, respectively, after imported feedstock had been replaced with Russian raw materials with a lower content of precious metals.

Utilisation of refining capacities // % of max



Breakdown of saleable nickel produced at Harjavalta // %



Process flowsheet of Norilsk Nickel Harjavalta

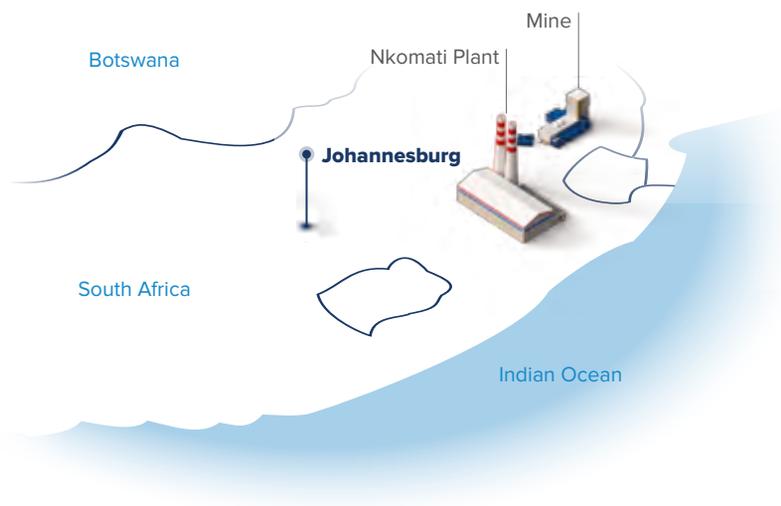
Metal	2015	2016	2017
Saleable nickel, t	43,479	53,654	59,716
including from the Company's Russian feedstock	424	19,012	55,021
Copper in copper cake, t	13,048	9,598	13,441
including from the Company's Russian feedstock	0	593	12,329
Palladium in copper cake, koz	78	64	42
including from the Company's Russian feedstock	0	8	35
Platinum in copper cake, koz	33	22	10
including from the Company's Russian feedstock	0	2	6

South Africa (Nkomati)

Nkomati is a 50/50 joint venture of the Norilsk Nickel Group and African Rainbow Minerals. Nkomati's performance is reflected in financial results using proportional consolidation according to our stake and not reflected in other totals.

Nkomati is located 300 km east of Johannesburg, Mpumalanga Province, South Africa.

It is the only South African company to produce nickel concentrate, which also contains copper, cobalt, chrome and PGM.



Mining

Nkomati has a substantial resource base represented by disseminated copper-nickel sulphide ores with several major ore bodies. The Main Mineral Zone (MMZ) is comprised of a solid sulphide ore body with a relatively high nickel content. The field also contains a Peridotite Chromite Mineralization Zone with a lower metal content vs MMZ and a relatively high chromium content.

The feedstock produced by open-pit and underground mining operations is processed at concentrators using sulphide flotation. The produced concentrates are then further processed at Kola MMC and third-party companies.

In 2017, total ore mined by Nkomati reached 3.5 mt (attributable to the Group's 50% shareholding) with an average nickel content of 0.31%.



Concentration

Concentration facilities

- MMZ Concentrator with installed capacity of 375 ktpm.
- PCMZ Concentrator with installed capacity of 250 ktpm.

The Norilsk Nickel Group accounted for 8.0 kt of nickel concentrate produced, which is lower than a year ago owing to reduced mining volumes and nickel content in ore processed.

Output at Nkomati¹

Metal	2015	2016	2017
Nickel, t	11,350	8,486	8,006
Copper, t	5,301	4,007	4,504
Palladium, koz	53	40	46
Platinum, koz	20	15	20

¹ Metal in concentrate for sale assuming 50% ownership

Key investment projects



CAPACITY UPGRADE AND RAMP-UP AT TALNAKH CONCENTRATOR



Norilsk Industrial District, Krasnoyarsk Territory
(Polar Division)



In April 2014, massive reconstruction of Talnakh Concentrator entered its main stage. In January 2015, Stage 1 was commissioned, followed by the launch of Stage 2 in May 2016. Decision on launching Stage 3 will be made in 1H 2018.

Highlights

Stage 1	Stage 2	Stage 3
<ul style="list-style-type: none"> – Maintaining existing capacity at 7.5 mtpa; – Reconstructing existing flotation capacities and replacing flotation machines that are beyond their useful lives and building a new tailings pit (first phase) 	<ul style="list-style-type: none"> – Ramping up capacity from 7.5 mtpa to 10.2 mtpa – Upgrading equipment; – Increasing nickel content in nickel-pyrrhotite concentrate from 5.8% to 9.5%; – Total CAPEX of ca. RUB 33.7 bn (USD 671 mln) 	<ul style="list-style-type: none"> – Ramping up capacity from 10.2 mtpa to 18 mtpa; – Building the second phase of the tailings pit. – Investment decision on launching Stage 3 expected in 1H 2018.

PROJECT SCHEDULE

- **2015**
Launch and commissioning of Stage 1
- **2016**
– Launch of Stage 2
– Pilot-launched of new tailings pit
- **2017**
– Full commissioning of Stage 2
– 2017 CAPEX of total project of ca. RUB 5.2 bn (USD 89 mln)
- **2018**
– Decision on commissioning Stage 3
– Output of key assets of new tailings pit (first phase)



MINING PROJECTS

Skalistaya mine

 Norilsk Industrial District, Krasnoyarsk Territory (Polar Division)

Increasing ore production from 1.8 mtpa to 2.2 mtpa in 2018 and to 2.4 mtpa by 2024 by stripping and extracting rich cupriferous ore reserves of the Talnakhskiye and Oktyabrskoye Fields.

Highlights

Ore reserves	65.9 mt
2017 CAPEX of ca.	RUB 13 bn (USD 216 mln)
2018–2024 CAPEX of ca.	RUB 65 bn (USD 1.1 bn)

Average metal content



PROJECT SCHEDULE

- **2017**
 - Production ramp-up to 1.75 mt
 - 152 m sinking of ventilation shaft–10 (total of 1.9 km out of 2.1 km)
 - 322 m sinking of skip-cage shaft–1 (total of 1.7 km out of 2.1 km)
 - Drifting of 4,519 m
- **2018**
 - 500 kt capacity commissioning
 - Completion of ventilation shaft
- **2019**
 - Completion of skip-cage shaft–1 construction
- **2020**
 - Completion of infrastructure construction
- **2024**
 - Production ramp-up to 2.4 mt

Taimyrsky mine

 Norilsk Industrial District, Krasnoyarsk Territory (Polar Division)

Increasing ore production from 3.6 mtpa to 3.8 mtpa by 2020 by stripping rich copper-nickel ores at the Oktyabrskoye Field.

Highlights

Ore reserves of	63.0 mt
2017 CAPEX of ca.	RUB 5.4 bn (ca. USD 93 mln)
2018–2023 CAPEX of over	RUB 22 bn (ca. USD 371 mln)

Average metal content



PROJECT SCHEDULE

- **2016**
 - 300 kt capacity commissioning
- **2017**
 - 1.8 km of underground workings completed and 100 kt of new capacity completed
- **2018**
 - Capacity commissioning (500 kt of rich ore)
 - Upgrading the hoist system at skip shaft No. 3
- **2019**
 - Capacity commissioning (200 kt of rich ore)
- **2020**
 - Capacity ramp-up to 3.8 mt
- **2021**
 - Capacity commissioning (400 kt of rich ore)

Oktyabrsky mine

 Norilsk Industrial District, Krasnoyarsk Territory (Polar Division)

Increasing ore production to 5.2 mtpa by 2023 by stripping high-grade, disseminated and cupriferous ores at the Oktyabrskoye Field.

Highlights

Ore reserves of	96 mt
2017 CAPEX of ca.	RUB 4 bn ca. USD 69 mln
2018–2025 CAPEX of ca.	RUB 6.0 bn (ca. USD 95 mln)

Average metal content



Komsomolsky mine¹

 Norilsk Industrial District, Krasnoyarsk Territory (Polar Division)

Increasing ore production to 3.8–4.0 mtpa before 2020.

¹ excluding Skalistaya mine.

Highlights

Ore reserves of	22.9 mt
2017 CAPEX of ca.	RUB 1.2 bn (ca. USD 18 mln)
2018–2022 CAPEX of over	RUB 14 bn (ca. USD 234 mln)

Average metal content



PROJECT SCHEDULE

- **2017**
 - 7 km of underground workings completed,
 - Capacity ramped up by 250 kt of disseminated ore and 100 kt of rich ore
- **2019**
 - Capacity commissioning (150 kt of rich ore and 700 kt of cupriferous disseminated ore)
- **2020–2025**
 - Capacity commissioning (300 kt of cupriferous ore)

PROJECT SCHEDULE

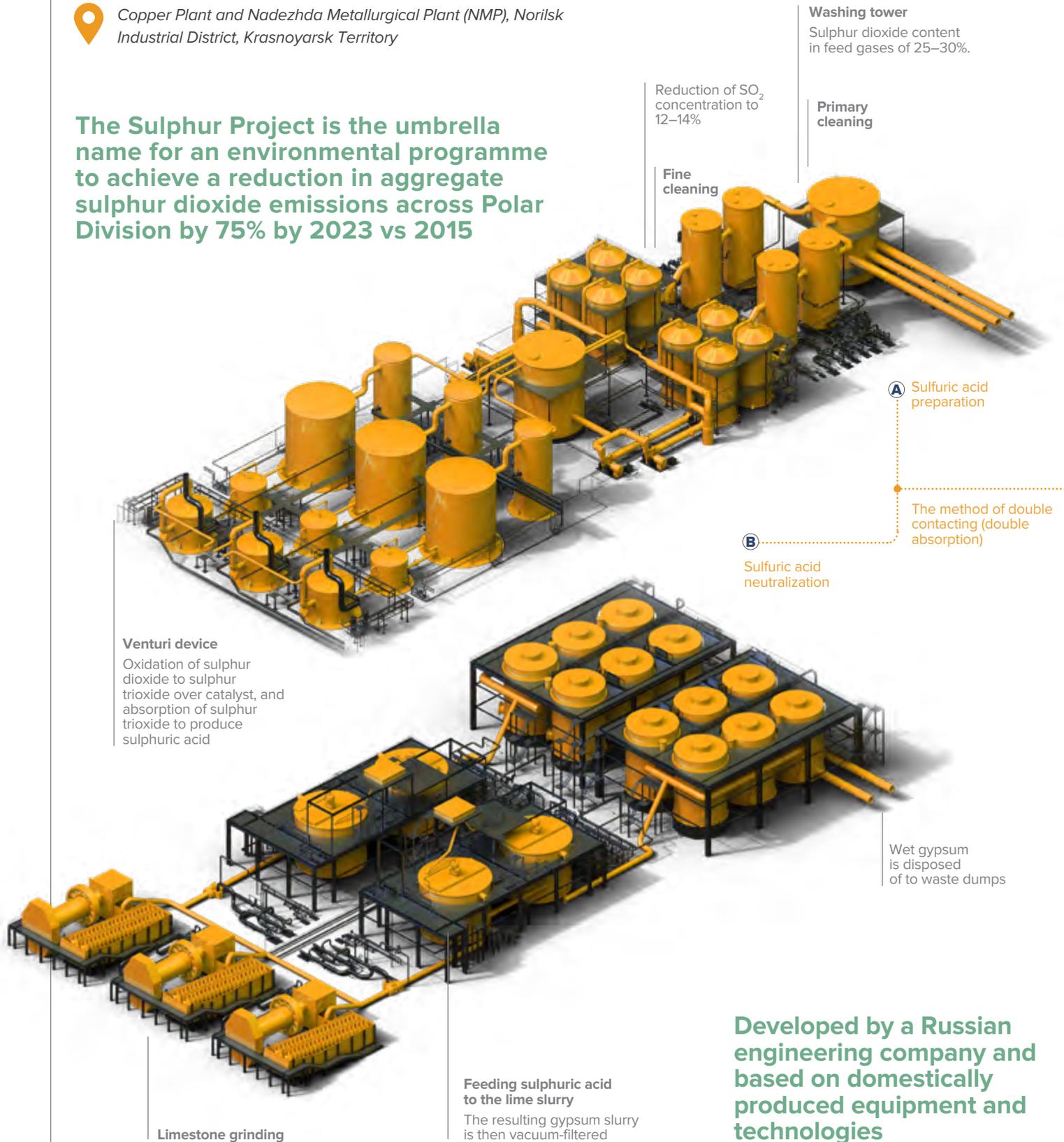
- **2017**
 - Power supply system completed at the southern ventilation shaft
 - Ca. 3 km of underground workings completed
 - 100 kt of rich ore capacity commissioned
- **2018**
 - Completion of the western backfilling shaft reconstruction
 - capacity commissioning (200 kt of cupriferous ore)
- **2019**
 - Capacity commissioning (175 kt of rich ore)
- **2020**
 - Capacity commissioning (225 kt of rich ore and 200 kt of disseminated ore)



SULPHUR PROJECT

 Copper Plant and Nadezhda Metallurgical Plant (NMP), Norilsk Industrial District, Krasnoyarsk Territory

The Sulphur Project is the umbrella name for an environmental programme to achieve a reduction in aggregate sulphur dioxide emissions across Polar Division by 75% by 2023 vs 2015



Developed by a Russian engineering company and based on domestically produced equipment and technologies

1

Nadezhda Metallurgical Plant

Nadezhda Metallurgical Plant will have new facilities capturing sulphur-rich gases, while sulphur acid will be neutralised with natural limestone, with waste gypsum produced as a result. In addition, a revolutionary continuous copper matte converting unit will be built. Its emissions will also be used to produce sulphur acid.

2

Copper Plant

Meanwhile, Copper Plant will see its elemental sulphur production capacities ramped up and the entire converter section shut down.

Highlights

2017 CAPEX of ca.	RUB 2.2 bn (ca. USD 37 mln)
Less sulphur dioxide emissions	75% by 2023
Estimated project costs of ca. (according to the feasibility study)	USD 2.6 bn
Completion scheduled for	2022



Video about the Sulphur Project

PROJECT STATUS

2016–2017

Nadezhda Metallurgical Plant:

- design specifications developed and approved, feasibility study prepared and approved;
- first long lead equipment arrangements made;
- design documents developed under a contract with Kazgiprotsvetmet

Copper Plant:

- design specifications developed, feasibility study prepared;
- engineering surveys required to develop key technical solutions to bring project up to date completed.

New volume of the Maximum Permissible Emission Rates for the period until 2023 approved. Project approved and presented at Strategy Day in November 2017.

2018 targets:

Nadezhda Metallurgical Plant:

- launching the Implementation stage to prepare engineering documents;
- obtaining the State Expert Review Board's approval for the project;
- start tender procedures for long lead equipment and select an EPC contractor for the project.

Copper Plant:

- Gipronickel Institute preparing engineering documents for non-standardised equipment;
- launching the Implementation stage to prepare engineering documents;
- arranging a tender to select a contractor for further implementation of the project, with on-site preparations.

Continuous copper converting facility:

- Obtaining the State Expert Review Board's approval for the NMP project; launching the Implementation stage to prepare engineering documents, start tender procedures for long lead equipment and select an EPC contractor for the NMP project.



TANK-HOUSE REFURBISHMENT



Severonickel Plant, Monchegorsk, Murmansk Region
(Kola MMC)



Tank-House 1 saw refurbishment of buildings, equipment, and utility and ventilation systems. The project was completed in 2016. Tank-House 2 is to be transformed into an advanced, cost-efficient cathode nickel facility by introducing the technology of nickel electrowinning from chlorine dissolved tube furnace nickel powder.

Highlights

Tank-House 1

Capacity commissioning of **45 ktpa**

CAPEX of ca. **RUB 0.8 bn**

Project completed in 2016.

Tank-House 2

Increasing the capacity from **120 ktpa to 145 ktpa of nickel**

Increasing the nickel recovery rate for converter matte by **more than 1%**

2017 CAPEX of ca. **RUB 7 bn (ca. USD 120 mln)**

CAPEX outstanding of ca. **RUB 14 bn (ca. USD 236 mln)**

Progress: **~40%**

PROJECT SCHEDULE

2017

42 electrolysis cells upgraded at Tank-House 2 to support chlorine leaching

2018

Gradual capacity commissioning

2019

Reaching the design capacity and performance targets



CONSTRUCTION OF A COPPER-NICKEL ORE CONCENTRATE SHIPMENT FACILITY



Zapolyarny, Murmansk Region
(Kola MMC)

The new facility will enable the Company to split its copper-nickel concentrate into low-grade and high-grade.

No low-grade concentrate processing will lead to significant cuts in sulphur dioxide emissions in Nickel. By re-arranging shipments of low-grade concentrate from Kola MMC to a third-party processor, the Company will be able to decommission ore-thermal furnace No 3 in the smelting shop and cut the operating costs.

Highlights

Dried high-grade concentrate unit with a capacity **of 150 ktpa**

2017 CAPEX of **RUB 0.8 bn (ca. USD 14 mln)**

Outstanding CAPEX of **RUB 4 bn (ca. USD 71 mln)**



PROJECT STATUS

September 2017

- Contract for engineering and equipment supplies signed with Outotec;
- Check-ups and surveys completed, preparation for utility systems dismantling and relocation in progress.

Q4 2018

Construction works of the project to be completed

Q2 2019

Output of key equipment



**BYSTRINSKY GOK
(CHITA PROJECT)**



Gazimuro-Zavodsky District, Zabaykalsky Krai
(GRK Bystrinskoye).



**PROJECT
SCHEDULE**

2017

- Naryn-1 (Borzya) – Gazimursky Zavod railway commissioned
- 220 kV power lines commissioned
- Mining and processing plant pilot-launched
- Camp for 1,047 people built

2021

Plant reaching the design capacity

Constructing an open pit and a mining and processing plant to utilise untapped reserves, constructing a railway and power lines, building a camp.

Average metal content



Highlights

Output of	10 mtpa
Ore reserves of	333 mt
2017 CAPEX of over	RUB 26 bn (ca. USD 449 mln)
Project CAPEX of over	RUB 89 bn (USD 1.6 bn)
New jobs for	3 thousand employees

Annual production volumes at design capacity (2021+)

Cu (concentrate)	~65 kt
Fe (magnetite concentrate)	2.1 mt (Fe — 66%)
Au (concentrate)	220 koz

Company overview

Strategy overview

Market overview

Business overview

Corporate governance

Information for shareholders

Appendices

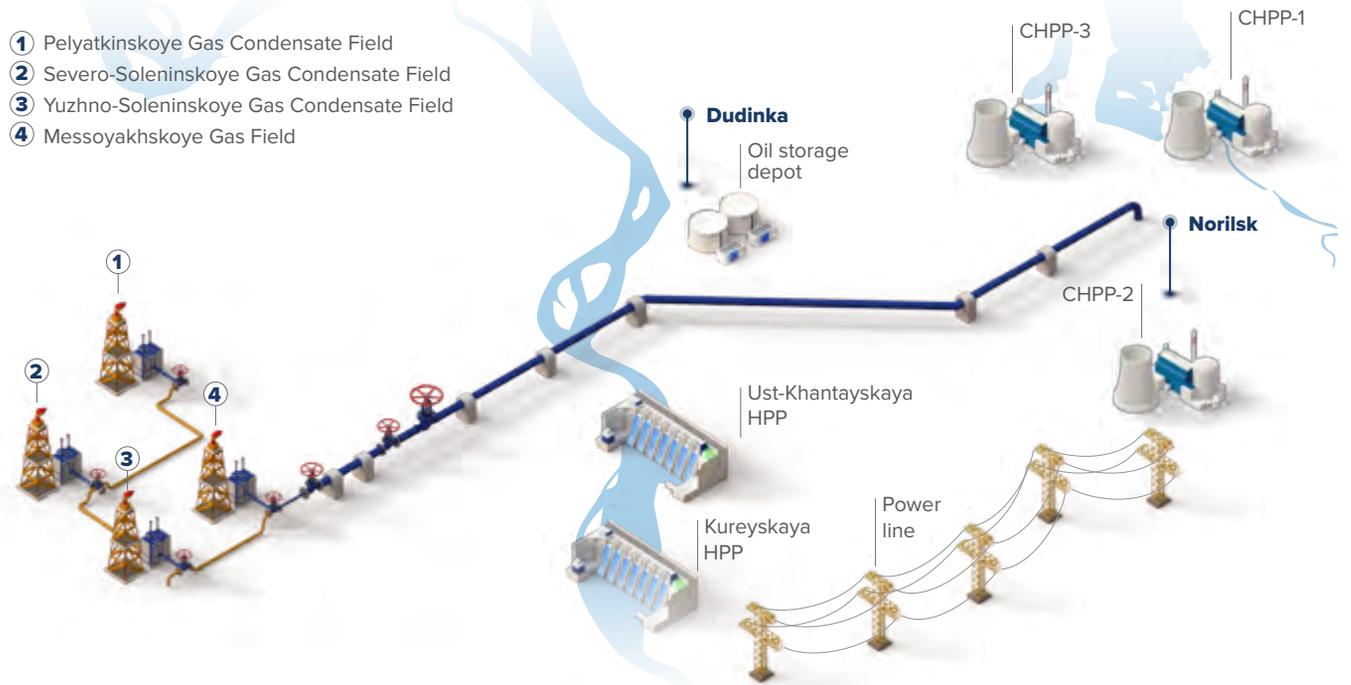
Gas and energy assets

2017 MILESTONES

Norilskgazprom and Taimyrgaz (Nornickel's gas producers) completed an investment project to build 12 production wells at the Pelyatkinskoye Gas Condensate Field. When commissioned, the wells will fully cover the peak demand for natural gas from the Norilsk Industrial District in winter.

At Ust-Khantayskaya hydropower plant (HPP), a new hydroelectric unit was put in operation as part of the third phase of an extensive programme to replace hydroelectric equipment. In 2012, Nornickel made a decision to replace seven adjustable blade hydroelectric units that had been operating for over 40 years. Improved reliability and service life of at least 50 years are among the key advantages of the new machinery. The first phase of the replacement programme was completed in November 2015, followed by the second phase in January 2016 and the third phase in August 2017, a month ahead of schedule.

Gas assets



The Company's gas assets operate as a stand-alone business unit focusing on sustainable development of the entire Norilsk Industrial District.

Taimyrgaz

Taimyrgaz operates the Pelyatkinskoye Field, which has Taimyr's largest hydrocarbon reserves. Currently, it is a primary source of natural gas fully covering the needs of the Norilsk Industrial District.

In 2017, Taimyrgaz worked on expanding its gas and gas condensate production and treatment capacity while improving the reliability of its core equipment:

- drilling of sidetracks No. 410, 411 and 846 completed;
- wells and a gas gathering system constructed and put in operation at well pad No. 4 followed by an increase in gas output by 1.2 mcm per day;
- well pads No. 5 and 6 installation completed and automatic controls introduced at wells No. 100 and 102 of the Pelyatkinskoye Field to remotely monitor their performance; additional equipment went online to protect the system against pressure drops;
- fire alarm and protection system designed for the Pelyatkinskoye Gas Condensate Field.

Norilskgazprom

Norilskgazprom operates the Messoyakhskoye Gas Field and Yuzhno-Soleninskoye and Severo-Soleninskoye Gas Condensate Fields.

In 2017, the company focused on expanding its gas and gas condensate production and treatment capacity while improving the reliability of its core equipment:

- construction of a gas distribution compressor station completed in Tukhard; the facility will be later handed over to Norilsktransgaz;
- condensate and methanol storage tanks and bunding around them repaired at the Messoyakhskoye Gas Field and Severo-Soleninskoye Gas Condensate Field;
- technical inspections and industrial safety assessments performed, with over 150 machinery units, buildings and structures certified as safe.

Norilsktransgaz

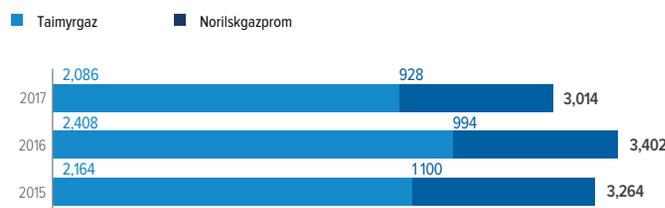
Norilsktransgaz transports natural gas and condensate to consumers in the Norilsk Industrial District.

The company was established as a result of Norilskgazprom's reorganisation in 2016 through the spin-off of the gas transportation system. In 2017, Taimyrtransgaz was liquidated, with its gas transportation assets and personnel transferred to Norilsktransgaz.

Natural gas and gas condensate reserves as at 31 December 2017

Field	Residual hydrocarbon reserves at licence blocks (A+B categories)	
	Free gas, bcm	Recoverable condensate, mln t
Norilskgazprom		
Messoyakhskoye Gas Field	6.807	–
Yuzhno-Soleninskoye Gas Condensate Field	52.8	0.5
Severo-Soleninskoye Gas Condensate Field	44.0	0.5
Taimyrgaz		
Pelyatkinskoye Gas Condensate Field	185.7	6.8
Total residual reserves	289.3	7.9

Natural gas production // mcm



Gas condensate production // kt



Energy assets

NTEK (Norilsk-Taimyr Energy Company)

NTEK engages in power and heat generation, transmission and distribution using the facilities of Norilskenergo (MMC Norilsk Nickel’s branch) and Taimyrenergo. The energy sources include renewables (hydropower) and gaseous hydrocarbons (natural gas).

NTEK supplies electric power, heat and water to Norilsk and all facilities in the Norilsk Industrial District. By its location and operational mode, the local power grid is isolated from the national grid (Unified Energy System of Russia), which means stricter reliability requirements. The company operates five generating facilities: three thermal power plants (TPP-1, TPP-2 and TPP-3) and two hydropower plants. Installed electricity generation capacity of the thermal power plants is 1,205 MW, while the total installed capacity of all the plants is 2,246 MW.

In 2017, thermal power plants generated 4,360 million kWh of power; hydropower plants produced 3,069 million kWh, up 139.5 million kWh against 2016. NTEK managed to bring headwater levels in the water storage reservoirs of its hydropower plants to their multi-year average to match the peak loads during the 2017–2018 heating season.

Ust-Khantayskaya and Kureyskaya HPPs (441 MW and 600 MW of installed capacity, respectively) are the two renewable power generation facilities operated by NTEK.

In 2017, renewables accounted for 38% of total power consumed by the Norilsk Nickel Group and 44% of power consumption in the Norilsk Industrial District.

The investment programme of the Norilsk Nickel Group includes several large-scale priority projects to fully unlock the potential of renewable power sources:

- replacement of obsolete hydroelectric units at Ust-Khantayskaya HPP to make better use of water resources, increase total power output, and improve the reliability of energy supplies to the Norilsk Industrial District;
- retrofitting at TPP-2 units 1 and 2;
- replacement of wooden poles with steel poles (a 5 km section at the plant's phase 1);
- introduction of an automated dispatch system at Ust-Khantayskaya HPP;
- construction of a hydrogen generation unit at TPP-2.

In 2017, extensive efforts were invested in improving energy efficiency. As a result, NTEK achieved savings of 100,116 tonnes of reference fuel (units), 44.9 million kWh of electricity and 177,732 Gcal of heat against plan. With 49 initiatives introduced to save on fuel and energy, fuel consumption at the thermal power plants decreased to 281.4 g/kWh in 2017, down by 13.9 g/kWh against plan and 27.7 g/kWh year-on-year.

Bystrinsk Electric Grid Company

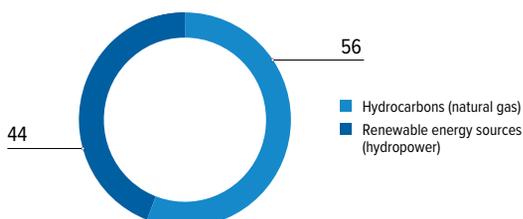
Bystrinsk Electric Grid Company was established in 2015 as a construction management business to carry out the investment project of building overhead Kharanorskaya GRES – Bugdainskaya – Bystrinskaya 220 kV power line from the 220 kV Bystrinskaya substation.

In 2017, the company:

- completed construction and installation activities;
- performed individual and integrated systems tests;
- obtained commissioning certificates;
- registered title to the facilities.

In late 2017, the overhead line and substation were formally transferred to FGC UES in accordance with the contract for the sale of power grid facilities.

Power generation in the Norilsk Industrial District in 2017 // %



Transportation assets

2017 MILESTONES

Nornickel Group increased its stake in Krasnoyarsk River Port to 88.77% of the company's shares. The transactions were part of the strategy of Nornickel's transportation and logistics function, which focuses on boosting the efficiency and streamlining the management of the Group's transportation assets.

In March 2017, the second berth was put in operation at the transfer terminal in Murmansk, taking its container handling capacity to 1.5 mtpa. According to Marina Kovtun, Governor of the Murmansk Region, "one and a half million tonnes is a large transshipment volume that contributes to new jobs and the overall development of Murmansk Sea Port, helping to attract investors to the region and enhancing Murmansk's position as a key port in the Arctic Zone".

In late 2017, MMC Norilsk Nickel's Board of Directors decided to establish Bystrinsky Transport Division to deliver products from, and supplies to, Bystrinsky GOK. The new unit will be operating a 227 km private railway line, which was built under a public private partnership to connect Naryn (Borzya) and Gazimursky Zavod.

Transportation and logistics assets



Given the exceptional location of our production facilities in relation to key supply bases and distribution markets, transport infrastructure and freight logistics are a primary focus for Nornickel.

Capitalising on their reliability and sophistication, the Company is well-positioned to address the most difficult tasks in freight deliveries and to ensure uninterrupted operations across its facilities.

Nornickel's transportation and logistics assets use various means of transportation and freight forwarding services, responding to freight logistics challenges faced by the Company and its customers.

The Company has a unique Arctic fleet comprising five Norilsk Nickel container vessels and one Yenisei heavy-duty ice-class tanker (ARC 7 under the PMPC classification). The vessels are able to break through 1.5 m thick Arctic ice without icebreaker support.

The **Yenisey tanker** is used to transport gas condensate from the Pelyatkinskoye Gas Condensate Field to European ports and other destinations. The Company's dry cargo fleet provides year-round freight shipping services between Dudinka, Murmansk, Arkhangelsk, Rotterdam, and Hamburg sea ports while also covering other destinations. In 2017, 66 voyages were made from Dudinka (vs 69 voyages in 2016), including 12 direct voyages to European ports (vs 11 voyages in 2016).

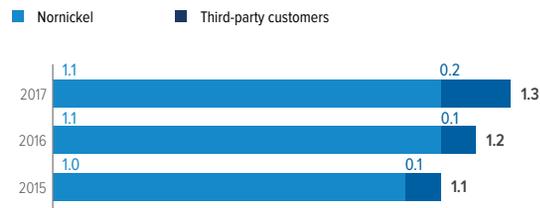
Norilsk Avia responds to industrial and social needs of the Norilsk Industrial District and the Dolgano-Nenets Municipal District of the Taimyr Peninsula. The company provides air transportation services related to operations of the Norilsk Nickel Group, emergency air medical services, search-and-rescue operations, and local passenger traffic..

NordStar Airlines is a rapidly developing aviation project launched on 17 December 2008, when the Board of Directors of Taimyr Air Company (a wholly owned subsidiary of MMC Norilsk Nickel) resolved to establish Moscow Branch of Taimyr Air Company along with the NordStar Airlines brand.

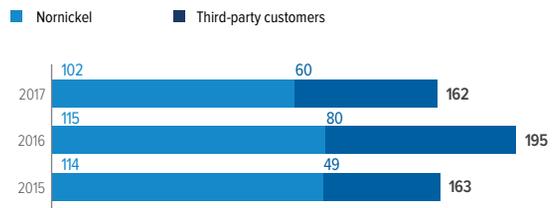
The company's fleet comprises 15 aircraft: nine Boeings 737-800, one Boeing 737-300 and five ATRs 42-500. With passenger traffic in excess of 1 million people per year, NordStar Airlines annually reaffirms its status of a major air carrier in the Siberian Federal District and nationwide. The air company's current route network covers over 30 cities in Russia and the CIS. Each year, NordStar operates seasonal charter flights from Moscow, St Petersburg and other cities.

Cargo transportation in 2017

Dry cargo transportation by the Company's fleet // mtpa



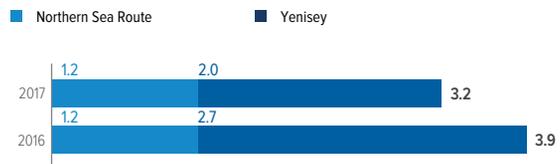
Transportation by Yenisey tanker // ktpa



Waterway cargo traffic at Murmansk terminal // mtpa



Waterway cargo traffic at Dudinka port // mtpa



In the reporting year, waterway cargo traffic at the Dudinka port saw a decline, mainly on the back of lower river sand shipments. In 2018, cargo volumes are expected to remain flat at the 2017 level.

Waterway cargo traffic at the Company's transfer terminal in Murmansk (Murmansk Transport Division) was 1.1 mt (vs 0.9 mt in 2016), with 162 vessels handled (vs 139 vessels in 2016), including 113 vessels on coastal voyages (vs 91 vessels in 2016) and 49 vessels on export and import voyages (vs 48 vessels in 2016). The increase in cargo traffic at the transfer terminal is driven by the changes in transshipment volumes of raw materials and end products after Polar Division's Nickel Plant was shut down. In 2018, the upward trend is expected to persist.

In 2017, the Company's own rail car and locomotive fleet carried 526.2 kt of cargo (vs 456.7 kt in 2016). In the reporting period, the terminal handled 14.3 thousand rail cars (vs 12.8 thousand in 2016) and 10.7 thousand road vehicles (vs 10.9 thousand in 2016). The increase in freight transportation by the Company's own rail car and locomotive fleet was due to the growing volumes of converter matte and, consequently, return traffic of empty cars.

During the upgrade of the Norilsk Airport in the summer of 2017, NordStar Airlines managed to ensure uninterrupted air services to passengers in the Norilsk Industrial District. Thanks to a professional and structured approach to the airport modernisation, the air carrier:

- organised transfer of passengers and their baggage;
- introduced a ticketing scheme to minimise anti-trust, transportation and social risks;
- developed a pricing methodology to make multi-flight air transportation with light aircraft more affordable to passengers.

+15%

traffic growth of the Company's own rail car and locomotive fleet in 2017

The cost growth in 2017 was driven by investments in the modernisation of the Norilsk Airport as part of a nationwide target programme, acquisition of a portal crane for Polar Transport Division and machinery for the modernised terminal in Murmansk, along with scheduled repairs of sea vessels in Murmansk Transport Division and helicopters operated by Norilsk Avia.

Investments in transportation and logistics assets

The cost growth in 2017 was driven by investments in the modernisation of the Norilsk Airport as part of a nationwide target programme, acquisition of a portal crane for Polar Transport Division and machinery for the modernised terminal in Murmansk, along with scheduled repairs of sea vessels in Murmansk Transport Division and helicopters operated by Norilsk Avia.

In 2017, Murmansk Transport Division completed the reconstruction of its transfer terminal. The programme provided for capital repairs of Berth No. 1, which are to be completed in 2018. Its scope also covers construction and fit-out of safety facilities to be continued in 2018. The Company purchased new cargo handling equipment and hoisting gear and also retrofitted some of its vessels. Solvo.TOS, a new process control system, was commissioned to optimise container handling procedures at the terminal. An information system for automation was also introduced to manage repairs of port machinery and equipment. Murmansk Transport Division plans to continue its IT improvement programme in 2018.

Investments in transportation and logistics assets

Cost item	2016		2017	
	USD mln	RUB bn	USD mln	RUB bn
Investments in transportation and logistics assets, including:	34.3	2.3	46.2	2.7
Capital construction	17.9	1.2	22.2	1.3
New equipment	10.4	0.7	15.4	0.9
Other costs	6.0	0.4	8.6	0.5

At Polar Transport Division (Dudinka port), the Company completed the first phase of repairs at Berths No. 4 and 5 and engineering surveys for the repair of Berth No. 3 in 2017. The repair programme to prevent the moorage wall destruction is scheduled to be completed in 2018. The Company modernised a fire water line at the log yard and introduced an integrated safeguarding system at port facilities. Additionally, two Liebherr mobile cranes and a mobile crane boom were repaired, two Liebherr crane booms were purchased for replacement in 2018, and a hangar was acquired to repair mobile cranes. The Company also purchased 10 units of road vehicles and cargo handling equipment.

In 2017, Yenisey River Shipping Company continued working on shipbuilding at Krasnoyarsk Ship Repair Yard and engineering design of new shipbuilding facilities. The project was launched in 2017 to provide the Company with its own river vessels to replace

retiring ships. The USD 3.4–5.1 mln (RUB 0.2–0.3 bn) project is expected to be completed in 2019. An automatic fire extinguishing sprinkler system was installed in the administrative building. The work is ongoing to improve onshore infrastructural facilities and increase the level of traffic safety by installing CCTV and fuel monitoring systems on vessels.

In 2017, the Company continued improving logistics processes in its transportation facilities and units. For Krasnoyarsk River Port and Lesosibirsk Port, it was the first navigation period to use the Automated Cargo Logistics Management System (ACLMS) as a master management system. Despite certain challenges, the introduction of ACLMS improved coordination between transshipment ports, carriers and end customers and provided a single reporting platform for freight transportation by river. These efforts will continue.

Production and sales

In 2017, Nornickel maintained its reputation as a reliable supplier of high quality products. The integrated index of customer satisfaction with the Company's products and services matched the criterion for positive performance.

Product range

One of the Company's objectives is to make sure its product range is in line with the current and prospective metals demand.

Over the last three years, Nornickel increased nickel supplies to segments other than stainless steel production by 32% (the 2017 supplies exceeded 100 kt of nickel), which was achieved by leveraging a focus strategy to boost sales to Chinese and Russian alloy and special steels makers, as well as by strengthening positions on China's electroplating market through the product range optimisation and extensive customer training. The Company also fostered cooperation with world-leading companies in the batteries segment.

Norilsk Nickel Harjavalta is considered one of world's foremost producers of nickel used to make precursors (semi-products essential for manufacturing the cathode material that forms part of batteries). Norilsk Nickel Harjavalta is uniquely flexible when it comes to manufacturing, which enables it to factor in consumer preferences in developing its product portfolio.

Norilsk Nickel Harjavalta's nickel sulphate is rightly considered the industry benchmark and is widely used in battery manufacturing. The Company plans to proactively market briquettes, which are traditionally supplied to stainless steel manufacturers, among battery and precursor producers.

In response to strong growth of demand by battery manufacturers, the Company is upgrading its nickel powder packaging capacities in order to broaden the range of packages and create individual solutions based on consumer preferences.

The Company considers joint ventures to produce nickel- and cobalt-bearing value-added products for the battery segment to be a promising direction for expanding the product range and increasing production volumes.

Key consumer industries

Construction: Cu
 Transport: Cu
 Heavy engineering: Cu
 Production of steel and non-ferrous metal alloys: Te, Ni, Co
 Stainless steel (200 and 300 series): Ni
 Non-ferrous metallurgy: Te, Na₂SO₄, NaCl
 Power grids: Cu
 Electronics manufacturing: Pt, Pd, Ru, Ag
 Electrical engineering: Se, Co, Rh, Ir, Ag

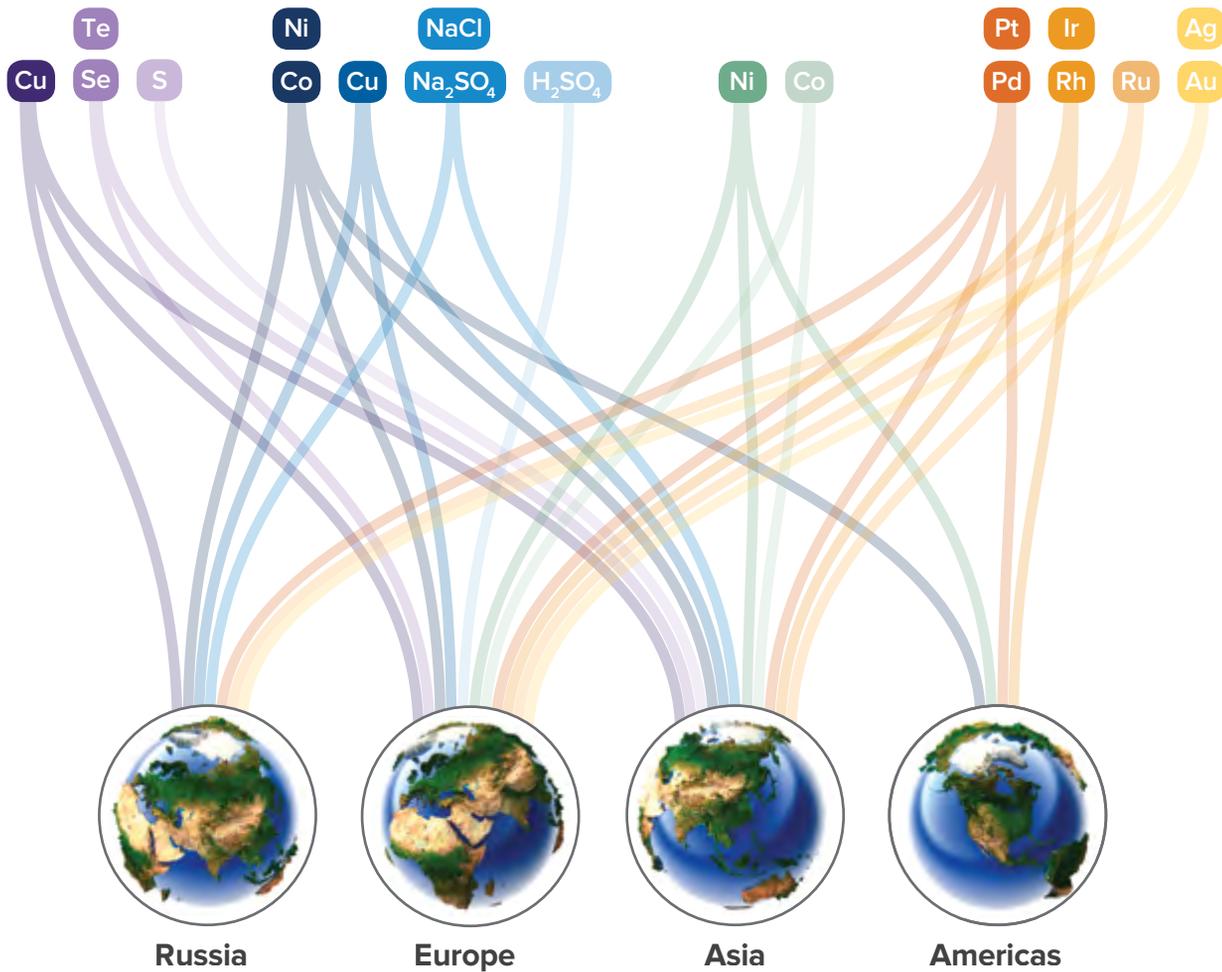
Electroplating: Ni, Co
 Li-ion/Ni-MH batteries: Ni, Co
 Additives and catalysts: Co
 Rubber vulcanising: S
 Spark plugs: Ir
 Pharmacology: Na₂SO₄, NaCl
 Medicine equipment: Pt
 Jewellery manufacturing: Pt, Pd
 Machine building and consumer goods production: Cu

Investments: Au
 Photovoltaics and thermoelectrical materials: Te
 Rubber industry: Te
 Animal feed and fertilisers: Se, S, H₂SO₄
 Glass industry: Se, Te, Rh
 Synthetic detergents production: Na₂SO₄, NaCl
 Pulp and paper, textile, leather industry: Na₂SO₄, NaCl
 Chemical industry: Se, S, Co, H₂SO₄, Pt, Pd, Rh, Ir, Ru

End product manufacturing



Types of products



Sales markets

- Copper ● Tellurium, Selenium ● Sulfur ● Nickel, Cobalt ● Copper ● Sodium sulfate and chloride ● Sulfuric acid ● Nickel ● Cobalt
- Platinum, Palladium ● Iridium, Rhodium ● Ruthenium ● Silver, Gold

¹ Refining of precious metals manufactured from Polar Division's and Kola MMC's feedstock under a tolling agreement

Sales strategy

Sales, along with production, have traditionally been a key value adding line of Nornickel's business.

When it comes to nickel products, the sales strategy focuses on achieving a balance between supplies to stainless steel manufacturers and to other industries.

As the world's largest producer of palladium, the Company continues to implement the strategy of entering into direct long-term contracts with end consumers to ensure sustainable and strong demand for platinum group metals.

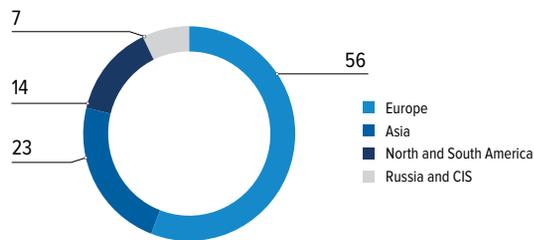
One of Nornickel's priorities is stable supply amid the growing demand for PGM:

- The Company refused to launch a marketing programme aimed at promotion of palladium in jewellery manufacturing in order to make it clear to the market that it intends to focus on supplying palladium for the automotive industry;
- In 2016, the Company established the Global Palladium Fund (GPF). In 2017, the GPF built Pd reserves of around 0.55 mln oz to safeguard supplies for the increasing demand from key consumers that are the Company's customers in 2018 and onwards (mostly from the automotive industry). The reserves were formed from purchases

of metal from third parties and the Company itself in accordance with consumer requirements to the product range.

To boost sales premiums and liquidity, Norilsk Nickel registers its products on the world's major exchanges, including the London Metal Exchange and Shanghai Futures Exchange.

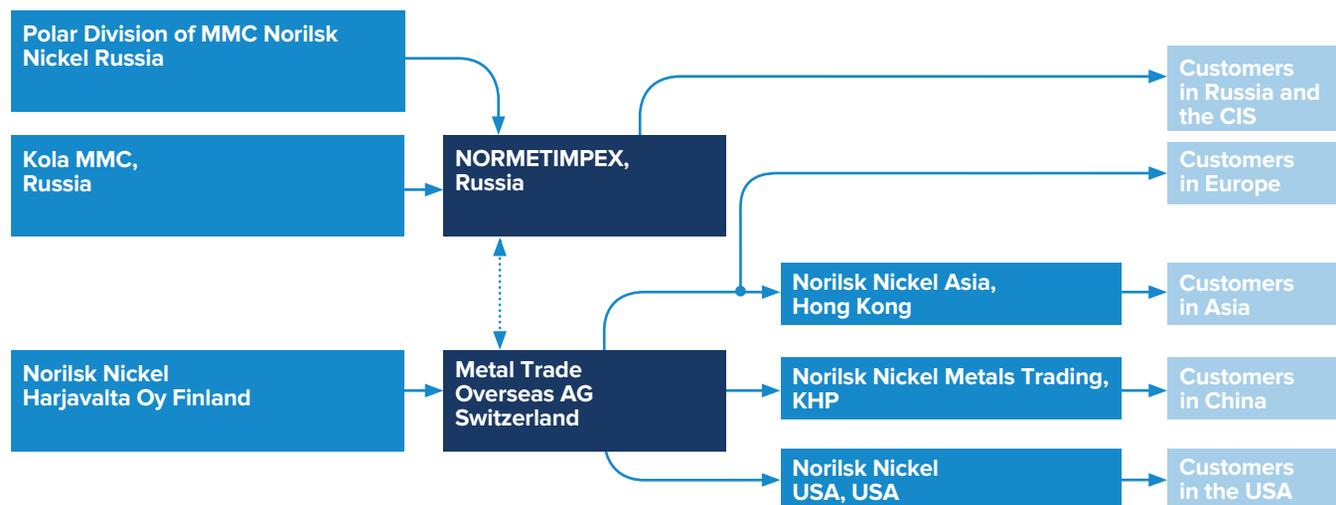
Sales by region // %



The Company supplies its products to

34 countries

Company Sales



Research and development



2017 MILESTONE

Nornickel is one of the smartest companies in Russia. It ranked first among the Top 15 Russian companies by value of intellectual capital (USD 22.4 bn), according to the Baker Tilly accounting and consulting firm.

The Group's main R&D facility is Gipronickel Institute, one of Russia's largest research and engineering hubs for mining, metallurgy, concentration and processing of minerals that develops a wide range of research and technology products.

In 2017, in addition to Gipronickel Institute, the Company used over 35 domestic and foreign research and engineering companies and also Russian universities, including: IPKON (Moscow), Siberian Federal University (Krasnoyarsk), VNIMI (St Petersburg), Outotec (St Petersburg), Norilsk State Industrial Institute (Norilsk), Mekhanobr Engineering (St Petersburg), NPO Atmosfera (Perm), VNIIR (Kazan), MIPT (Moscow), Institute of Chemistry and Technology of Rare Elements and Mineral Raw Materials (Apatity), SPb-Giproshakht (St Petersburg), St Petersburg Mining University (St Petersburg), Uralmekhanobr (Yekaterinburg), RZD Logistics (St Petersburg), etc.

Nornickel's R&D activities mainly focused on research, technological development, and feasibility studies under the Company's updated strategic development plan.

The Company also carried out its operating efficiency programme for 2015–2017 aimed at finding unique solutions to streamline the mining planning process, increase overall recovery rates for nickel, copper, cobalt and PGM, re-process secondary resources (tailings, copper slags, and nickel bearing pyrrhotite with a low nickel content), and optimise the work-in-progress inventory levels. Other programmes included upgrade of nickel and cobalt production technologies at Kola MMC, improvement of product quality and optimisation of production costs.



R&D and feasibility studies financing // USD mln



Results in key R&D areas in 2017

Company Development Strategy

- feasibility study to choose the optimal design for the Company's copper refining facilities (stage 2);
- operating procedures for a feasibility study on refining non-ferrous and precious metals.

Production

Mining:

- adjusted design documents at the mines;
- feasibility study on building an underground crushing section at Skalistaya mine;
- audit of mechanical earth models of Polar Division mines (stage 1);
- feasibility study on using tailings for backfilling on Talnakh mines and on providing Polar Division with limestone and cement.

Concentration:

- project on producing high-grade and low-grade concentrate at Kola MMC's concentrator and organising shipments of the high-grade concentrate to be accepted and processed at Nadezhda Metallurgical Plant of the Company's Polar Division;
- adjusted operating procedures for ore enrichment at the Bystrinskoye Field;
- adjusted operating procedures for simultaneous processing of disseminated and cuprous ore mixture at Stage 3 of the Talnakh Concentrator.

Smelting:

- adjusted operating procedures to design nickel production facilities at Kola MMC based on the chlorine leaching technology, which will improve the tank-house-2 capacity to 145 ktpa of cathode nickel;
- adjusted operating procedures to design continuous converting facilities at Nadezhda Metallurgical Plant;
- development of operating procedures to design the upgrade of copper production based on the new roast-leach-electrowin technology at Kola MMC;
- development of operating procedures and feasibility study for the process to neutralise sulphuric acid with natural limestone.

Environmental protection

- development of operating procedures and feasibility study to produce elemental sulphur;
- inventory of air emissions and development of draft limits for maximum permissible emission at Polar Division's core production facilities;
- comparison of the technology for producing sulphuric acid and neutralising it with natural limestone vs elemental sulphur production technology used at Nadezhda Metallurgical Plant.

Supply management



KEY DEVELOPMENTS IN 2017

In 2017, Nornickel became Company of the Year in competitive procurement and won the Grand Prix at the Procurement Leaders Awards, with its project for an end-to-end transformation of the procurement function receiving the highest commendation from the expert community. Supply management is going to play the key role as the Company's 2020 Programme for Improving Performance and Reducing Per Unit Costs unfolds.

The Company's supply management units are tasked with ensuring timely, adequate and comprehensive supplies as required for uninterrupted operations, which means procurement on the best possible terms.

With its diverse businesses (from construction of Bystrinsky GOK to reconstruction of Norilsk Airport in the Far North) and geography of operations, the Company faces many challenges it has to address in terms of procurement.

The procurement plan covers 48 aggregated categories – from construction and installation services and equipment to food supplies. For purchases of general-purpose industrial machinery and equipment only, the Group has set up some 200 sub-categories.

The supplies are shipped along the Yenisey River and the Northern Sea Route using the Company's own fleet during the navigation season, as well as by air. There is no railway or motorway connection between the Taimyr Peninsula and mainland Russia, which makes delivery by land to the Norilsk Industrial District impossible.

Supply management operations include:

- requirements planning and supply management;
- procurement.

Requirements planning and supply management

Accurate planning and availability of stock are key to uninterrupted operations at Nornickel. At the same time, the Company needs to focus on optimising inventory, to minimise its working capital. Idle inventory, if any, is assessed based on production needs. Depending on the results, the Company decides whether it is going to be:

- used in production as and when needed;
- sold;
- written off and disposed of.

Overall, 2017 saw the Company implement a set of optimisation measures with respect to requirements planning and meeting the needs of its key production sites. Changes in the structure of production assets had an impact on the volume and composition of the Company's inventory. At the same time, Polar Division and Kola MMC, the Company's major production sites, decreased their inventory for core operations by 3.06% to an absolute level of USD 380 mln (RUB 22.2 bn), while also fully meeting the needs of their production, repair and other units.

The Company needs to focus on optimising inventory, to minimise its working capital. Idle inventory.

Despite an increase in production assets, the Group's inventory as per the RAS statements also dropped by 3.5% y-o-y to USD 701 mln (RUB 42.5 bn).

At the planning stage, the Company defines health, safety and environment, as well as other mandatory and optional product requirements, including availability of certificates, permits, and licenses. Further on, when procurement procedures are under way, suppliers' proposals are checked for compliance with the Company's requirements.

Procurement

All procurement activities in the Company rely on the regulated procedures and policies and are in full compliance with Federal Law No. 223-FZ On Procurement of Goods, Work and Services By Certain Types of Legal Entities dated 18 July 2011, as well as Business Ethics Code, Anti-Corruption Policy, Regulation on the Product Procurement Procedure, as amended in 2016, and other regulatory documents of the Company.

The Company develops procurement policies for select materials and supplies that establish binding principles and approaches to procurement in specific product groups. In 2017, the Company purchased ca. 33% of supplies for core operations based on category procurement policies (24% in 2016, 17% in 2015).

Procurement activities can be either centralised or organised independently by the Head Office, branches or Group enterprises. Depending on the expected purchase price, procurement can be organised either as a bidding procedure (tender), simple procurement, or simplified procurement.

Procurement procedures may involve collective procurement bodies, such as the tender committee, tender commissions of the Head Office, procurement and tender commissions of the branches and Group companies. In 2017, the tender committee and tender commissions of the Head Office that are in charge of the most expensive procurement items, full-cycle projects and IT products, carried out procurement for over USD 325 mln (RUB 19 bn). The Company's tender committee focuses on improving procedures for identifying reliable suppliers of quality products at a fair market value.

Nornickel provides support to tenders run by the Company's Russian subsidiaries and branches. In 2017, the Company oversaw tender procedures to purchase services for over USD 343 mln (RUB 20 bn).

In 2017, the Company signed over 4,000 contracts for centralised procurement of materials and equipment worth around USD 1.6 bn, with a total price decrease of 5%, which is below the levels recorded by the Federal State Statistics Service.

At Nornickel, the procurement process is certified for compliance with ISO 9001 and ISO 14001.

In the reporting year efforts focused on developing and implementing procurement guidelines, and harmonising the regulatory procurement framework across Russian subsidiaries and branches, including services procurement, were continued.



Number of the Company's suppliers and contractors



Procurement automation and stronger competition

Nornickel has put in place SAP SRM, an automated solution for supplier relationship management. The Company also widely uses independent bidding platforms, such as Fabrikant.Ru or B2B-Centre. These solutions help improve the supplier selection transparency and competitive environment when procurement procedures are under way.

Nornickel pays close attention to fostering ties with reliable domestic suppliers and contractors. Foreign suppliers are mainly engaged for delivering unique equipment or systems that do not have Russian alternatives.

As at the end of 2017, domestic suppliers outnumbered foreign ones by 14 to 1.

Preventing corruption and other misconduct

Nornickel's Corporate Security Unit evaluates the business reputation, reliability and solvency of potential counterparties to mitigate risks.

To prevent potential procurement misconduct and secure maximum benefit through unbiased selection of the best proposal, Nornickel adheres to the following rules:

- procurement relies on the role allocation principle (procurement owner, customer and secretary of a collective procurement body);

- business or technical and business proposals of qualified suppliers are compared based on objective and measurable criteria approved prior to the request of proposals stage;
- the results of the qualification-based selection and the winner are approved by the collective procurement body comprising representatives from various functional units of the Company.

The purchases made by certain subsidiaries of Nornickel are subject to Federal Law No. 223-FZ On Procurement of Goods, Work and Services By Certain Types of Legal Entities dated 18 July 2011. As part of anti-corruption efforts undertaken by the Company, these subsidiaries must disclose additional details in the unified information system, including:

- annual volume the customer is required to procure from small and medium businesses; and
- the number and total price of contracts awarded to small and medium businesses.

-5%

total price decrease in the procurement of materials and equipment