

SALEABLE METALS PRODUCTION

Product	2018	2019	2020
Group total			
Nickel, kt	218.8	228.7	235.7
from own feed	216.9	225.2	232.5
Copper, kt	473.7	499.1	487.2
from own feed	473.5	498.8	486.8
Palladium, koz	2,729	2,922	2,826
from own feed	2,729	2,919	2,820
Platinum, koz	653	702	695
from own feed	653	700	693
Norilsk and Kola Divisions			
Nickel, kt	158.0	166.3	172.4
Copper, kt	455.6	486.2	484.7
Palladium, koz	2,671	2,868	2,809
Platinum, koz	642	690	691
Kola Division – NN Harjavalta			
Nickel, kt	60.8	62.4	63.4
Copper, kt	18.0	12.9	2.5
Palladium, koz	58	54	17
Platinum, koz	11	12	4
Nkomati (South Africa)¹			
Nickel, kt	6.6	6.5	5.8
Copper, kt	3.1	3.4	2.9
Palladium, koz	33	33	30
Platinum, koz	13	14	13

NORILSK DIVISION (RUSSIA)

The Norilsk Division is the Group's flagship assets boasting a full metals production cycle from ore mining to the shipment of finished products to customers. They are located on the Taimyr Peninsula in Russia, in the north of the Krasnoyarsk Region beyond the Arctic Circle, and linked to other regions by the Yenisey River, the Northern Sea Route, and by air.

Operating the largest deposits in the Company's portfolio, the Norilsk Division mines over 18 Mtpa of copper-nickel sulphide ore.

In 2020, the Norilsk Division accounted for

72% copper

42% PGMs

of the Group's total

¹ Nkomati's operating results are not consolidated into the Group's total results.

MINING

The Norilsk Division mine copper-nickel sulphide ores of three grades: rich ores, characterised by a higher content of base and precious metals; cuprous ores, with a higher copper content vs nickel; and disseminated ores, with a lower content of all metals.

The Talnakhskoye and Oktyabrskoye deposits are developed by Taimyrsky, Oktyabrsky, Komsomolsky, Skalisty and Mayak Mines. The mines deploy slicing and chamber methods with

the cut-and-fill system. Stopes are refilled with backfill mixtures, with their composition adjusted in each case depending on technological requirements for mine backfill durability.

The Norilsk-1 deposit is developed by Zapolyarny Mine (Medvezhy Ruchey – South Cluster project), through open-pit and underground mining. Underground mining is carried out through sublevel (level) caving using front ore passes and self-propelled vehicles.

Ore production from the Norilsk Division was 18.8 mln t in 2020, up 0.4 mln t y-o-y (+2%). Rich and disseminated ore production increased by 2% and 10%, respectively, with Taimyrsky and Skalisty Mines also increasing their combined rich ore production by 12% y-o-y. Disseminated ore production grew at Komsomolsky Mine (+42%) and Zapolyarny Mine (+4%). Total production of cuprous ore decreased by 5% y-o-y. The change in the mined ore output was in line with the annual production plan.

ORE OUTPUT (MLN T)

Mining asset, ore type	Mine type	2018	2019	2020
Total ore		17.32	18.42	18.82
rich		6.78	7.35	7.48
cuprous		5.24	5.75	5.49
disseminated		5.30	5.32	5.85
ZAPOLYARNY				
Oktyabrskoye deposit:		8.95	9.45	9.58
Oktyabrsky Mine	Underground	5.17	5.37	5.34
rich		0.98	0.88	0.80
cuprous		2.98	3.38	3.41
disseminated		1.21	1.11	1.13
Taymirsky Mine	Underground	3.79	4.08	4.24
rich		3.79	4.08	4.24
Talnakhskoye and Oktyabrskoye deposits:		6.70	7.34	7.55
Komsomolsky Mine	Underground	3.82	4.00	4.25
rich		0.11	0.10	0.14
cuprous		2.18	2.28	1.81
disseminated		1.53	1.62	2.3
Skalisty Mine	Underground	1.95	2.34	2.54
rich		1.87	2.25	2.27
cuprous		0.09	0.09	0.27
Mayak Mine	Underground	0.93	1.00	0.76
rich		0.04	0.04	0.03
disseminated		0.89	0.97	0.73
MEDVEZHY RUCHEY				
Norilsk-1 deposit				
Zapolyarny Mine	Open-pit/underground			
disseminated		1.67	1.63	1.69

CONCENTRATION

Talnakh Concentrator processes rich, cuprous and disseminated ores from the Oktyabrskoye and Talnakhskoye deposits to produce nickel-pyrrhotite and copper concentrates, and metal-bearing products. The key processing stages include crushing, milling, flotation and thickening.

Norilsk Concentrator processes all disseminated ores from the Norilsk-1 deposit, cuprous and disseminated ores from the Oktyabrskoye and Talnakhskoye deposits, and low-grade ores from Copper Plant to produce nickel and copper concentrates. The key processing stages include crushing, milling, flotation, gravity concentration and thickening.

Thickened concentrates are transported from Talnakh and Norilsk Concentrators via slurry pipelines for further processing. In 2020, the Company's concentration facilities processed a total of 18.5 mln t across all types of ore feedstocks (including rich, cuprous and disseminated ores).

Talnakh Concentrator processed 10.9 mln t of ore in 2020 (up 0.2 mln t y-o-y). Its nickel recovery from ore into bulk flotation concentrate, including the output of metal-bearing pyrrhotite products, increased by 2.0% y-o-y to 87.9% due to the optimised technology for obtaining copper-nickel concentrate deployed at Talnakh Concentrator.

Talnakh Concentrator increased ore processing to 7.6 mln t (up 0.1 mln t y-o-y) in 2020. The facility's nickel recovery into bulk concentrate was 0.7% lower y-o-y at 70.6%. During the year, the facility also processed significant amounts of low-grade ores from Copper Plant.

CONCENTRATION FACILITIES

- Talnakh Concentrator
- Norilsk Concentrator

ORE PROCESSING AND NICKEL RECOVERY

Concentrator	2018	2019	2020
Sulphide ores processed (mln t)			
Talnakh Concentrator	10.4	10.7	10.9
Norilsk Concentrator	6.8	7.5	7.6
Nickel recovery (%)			
Talnakh Concentrator	83.2	85.9	87.9
Norilsk Concentrator	71.9	71.3	70.6

SMELTING

Production chain

The produced concentrates, including steam cured sulphide concentrate, and secondary materials are fed into flash smelting furnaces at Nadezhda Metallurgical Plant. Steam cured sulphide concentrate is leached at Hydrometallurgical Shop of Nadezhda Metallurgical Plant from products with low metal content, such as Talnakh Concentrator's metal-bearing products,

products from Nadezhda Metallurgical Plant's tailings facility, and concentrates from tailings ponds. The matte produced in flash smelting furnaces is then converted into high-grade converter matte.

Copper Plant processes all of the copper concentrate from the Company's concentrators, as well as third-party feedstocks, to obtain copper cathodes, elemental sulphur and sulphuric acid for the operational needs of the Polar Division.

SMELTING ASSETS

- Nadezhda Metallurgical Plant
- Copper Plant
- Copper Plant's smelting shop

Copper Plant's smelting shop recycles sludge from the copper tankhouses of Copper Plant and Kola MMC to produce precious metal concentrates, commercial selenium and tellurium.

The precious metals produced by the Norilsk Division are refined at Krastsvetmet, URALINTECH, and Prioksky Plant of Non-Ferrous Metals under tolling agreements.

Copper production remained basically flat y-o-y in 2020, with a slight decrease of 1% due to a lower-than-expected copper content in the stored copper concentrate provided by Rostec and concentrate stock drawdowns by Rostec. PGM output increased by 15% y-o-y, mainly due to temporary processing of chlorine dissolution residue by Copper Plant (during the deployment of a new precious metal production technology at Kola

MMC) and higher precious metal content in the copper cake supplied by Norilsk Nickel Harjavalta.

The Polar Division products:

- Copper cathodes
- Nickel converter matte sent for processing to Kola MMC
- Precious metal concentrates
- Commercial sulphur, selenium
- Tellurium in billots

PRODUCTION VOLUMES

Product	2018	2019	2020
Copper, t	353,131	355,706	351,413
Palladium, koz	987	1,042	1,180
Platinum, koz	260	251	302

KOLA DIVISION (RUSSIA)

Kola MMC is Nor Nickel's wholly owned subsidiary and a valuable production asset located in the Kola Peninsula in the Murmansk Region of Russia.

In 2020, Kola MMC accounted for 73%, 14% and 57% of the Group's total nickel, copper, and PGM finished products, respectively.

MINING

Kola MMC mines disseminated copper-nickel sulphide ores.

At Kola MMC, various ore mining methods are used:

- The Zhdanovskoye and Zapolyarnoye deposits use three mining methods: gravity caving with front ore passes, sublevel caving with room-and-pillar ore removal, and room-and-pillar mining. To ensure full utilisation of the concentrator's design capacity, off-balance (sub-economic) open-pit mining waste is processed as well

- The Kotselvaara and Semiletka deposits primarily use stoping from sublevel drifts and sublevel caving. Room-and-pillar short-hole and long-hole stoping are also used on a limited scale

In 2020, Kola MMC produced about 7.7 mln t of ore (down 3% y-o-y), with the marginal decrease attributable to dwindling surplus ore inventories that had built up at the end of 2019 due to scheduled maintenance at the concentrator.

ORE OUTPUT (MLN T)

Mining asset	Mine type	2018	2019	2020
Total ore		7.90	7.91	7.65
Zhdanovskoye deposit:		7.14	7.25	7.08
Severnny Mine	Underground	6.56	6.49	6.43
Severnny Mine	Open-pit	0.58	0.77	0.65
Zapolyarnoye deposit:		0.08	0.06	0.05
Severnny underground section	Underground	0.08	0.06	0.05
Kotselvaara and Semiletka deposits:		0.68	0.60	0.52
Kaula-Kotselvaara mine	Underground	0.68	0.60	0.52