

KOLA PENINSULA (Kola MMC)

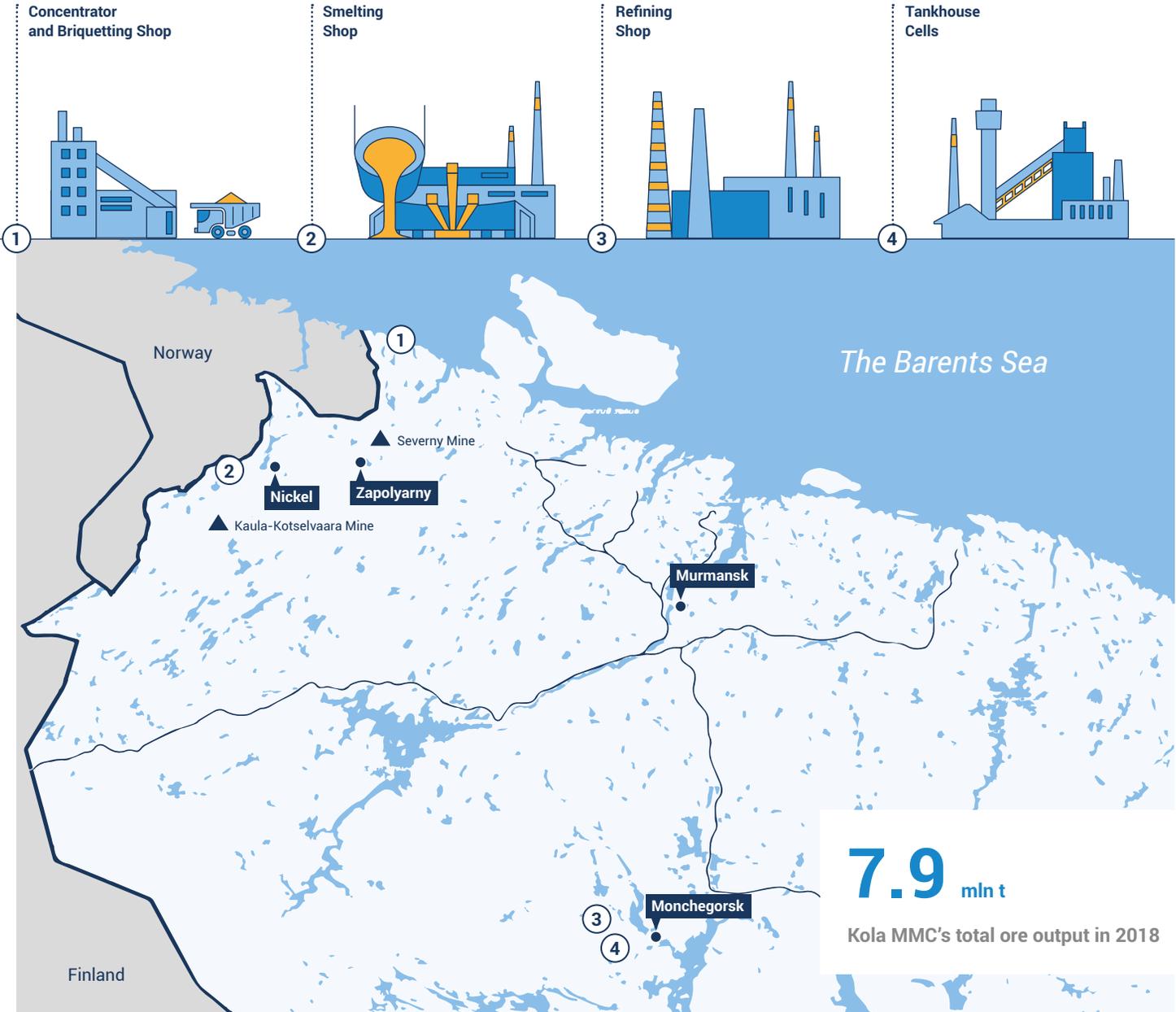
2018 milestone



In 2018, Kola MMC accounted for 72%, 18% and 61% of the Group's total nickel, copper and PGM end products, respectively.

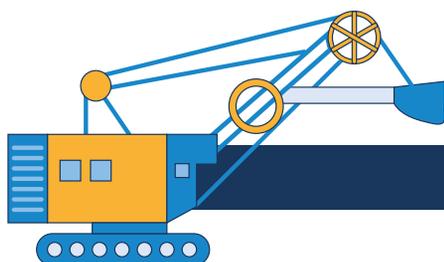
Kola Mining and Metallurgical Company (Kola MMC) is Norilsk Nickel's 100% subsidiary and an important production asset.

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



7.9 mln t

Kola MMC's total ore output in 2018



MINING (Kola MMC)

Kola MMC produces disseminated copper-nickel sulphide ores containing nickel, copper and other commercial components.

2018 milestones



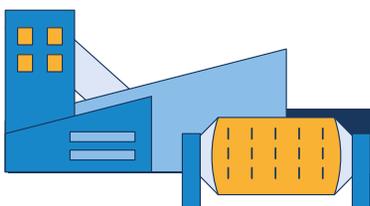
In 2018, Kola MMC's total ore output amounted to 7.9 mt, up 3.4% y-o-y, owing to higher volumes of ore mined to ensure utilisation of the concentrators' design capacity. The change in the volumes of ore mined was in line with the annual production plan.

It leverages various ore mining methods:

- the Zhdanovskoye Deposit uses sublevel longwall caving with front ore passes, block caving (limited scope of application), and open-pit mining (at Yuzhny open pit);
- the Kotselvaara and Semiletka Deposits 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).

Ore output (mt)

Mining asset	2016	2017	2018	Mine type
Total ore mined	7.62	7.64	7.90	
Zhdanovskoye Deposit:	6.77	6.81	7.14	
Severny Mine	6.31	6.55	6.56	● Underground
Severny Mine	0.46	0.26	0.58	● Open-pit
Zapolyarnoye Deposit:	0.14	0.14	0.08	
Severny Mine	0.14	0.14	0.08	● Underground
Kotselvaara and Semiletka Deposits:	0.71	0.70	0.68	
Kaula-Kotselvaara mine	0.71	0.70	0.68	● Underground



CONCENTRATION (Kola MMC)

Concentration facilities

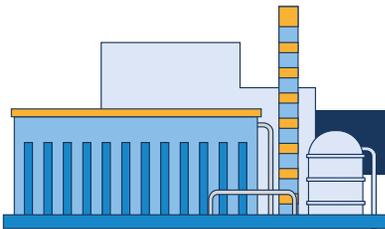
- Zapolyarny Concentrator.

The Concentrator produces briquetted copper-nickel concentrate. Briquettes are delivered to Smelting Shop to produce converter matte.

2018 milestones



In 2018, Kola MMC's Concentrator processed 7.9 mt of ore, up 0.3 mt y-o-y. In 2018, the rate of metals recovery in bulk concentrate was below the 2017 level due to the higher share of complex morphology ores with disseminated sulphide minerals in the charge.



SMELTING (Kola MMC)

2018 milestones



In 2018, Kola MMC produced more nickel and copper than in the previous year thanks to the extension of its carbonyl capacities and supply of richer copper concentrate from Polar Division. Decreased PGM output in 2018 was due to eliminated low-margin processing of third-party feedstock and accumulated work-in-progress inventories with a high degree of readiness at Krasnoyarsk Precious Metals Refinery engaged in precious metals refining under a tolling agreement.

Smelting facilities

- Smelting Shop (Nickel)
- Briquetting section (Zapolyarny)
- Metallurgical Shop (Monchegorsk)
- Refining Shop (Monchegorsk)
- Tankhouses 1 and 2 (Monchegorsk)

The Company is upgrading Tankhouse 2 to create a nickel cathode production unit harnessing the technology of nickel electrowinning from chlorine dissolved tube furnace nickel powder. The project is set to boost the Company's production capacity from 120 ktpa to 145 ktpa of electrolytic nickel while also improving the recovery rates by 1%. In late 2018, Norilsk Nickel commissioned the first series of electrolysis cells, with the project expected to reach its design capacity by the end of 2019.

Metals output

Metal	2016	2017	2018
Nickel, kt	131,235	157,396	158,005
from own Russian feed	126,937	155,110	157,519
Copper, kt	70,272	80,781	83,070
from own Russian feed	63,542	78,587	82,987
Palladium, koz	851	1,782	1,684
from own Russian feed	815	1,737	1,684
Platinum, koz	173	401	382
from own Russian feed	159	385	382

Product offering:

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