

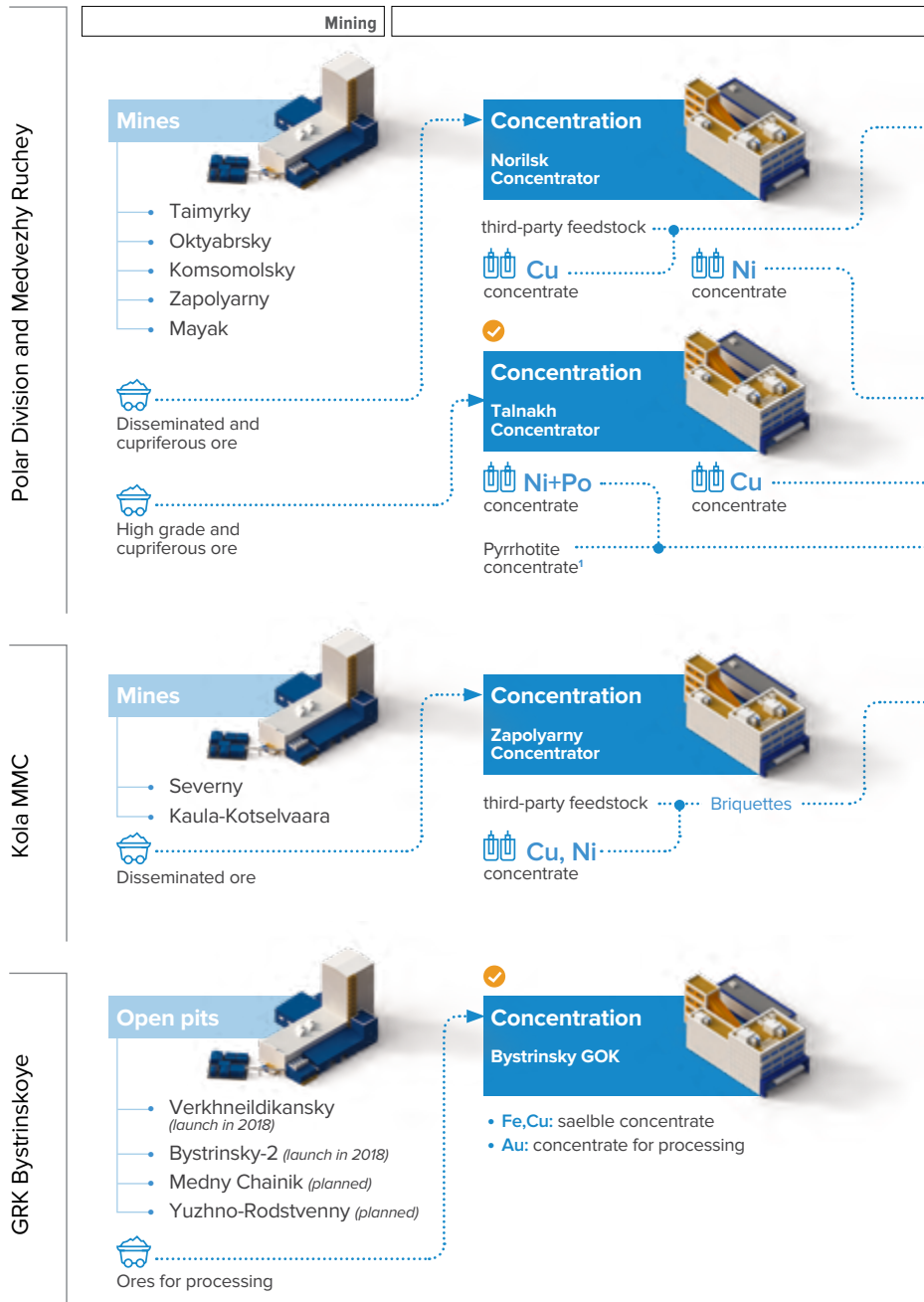
# Production assets and activities

## 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.

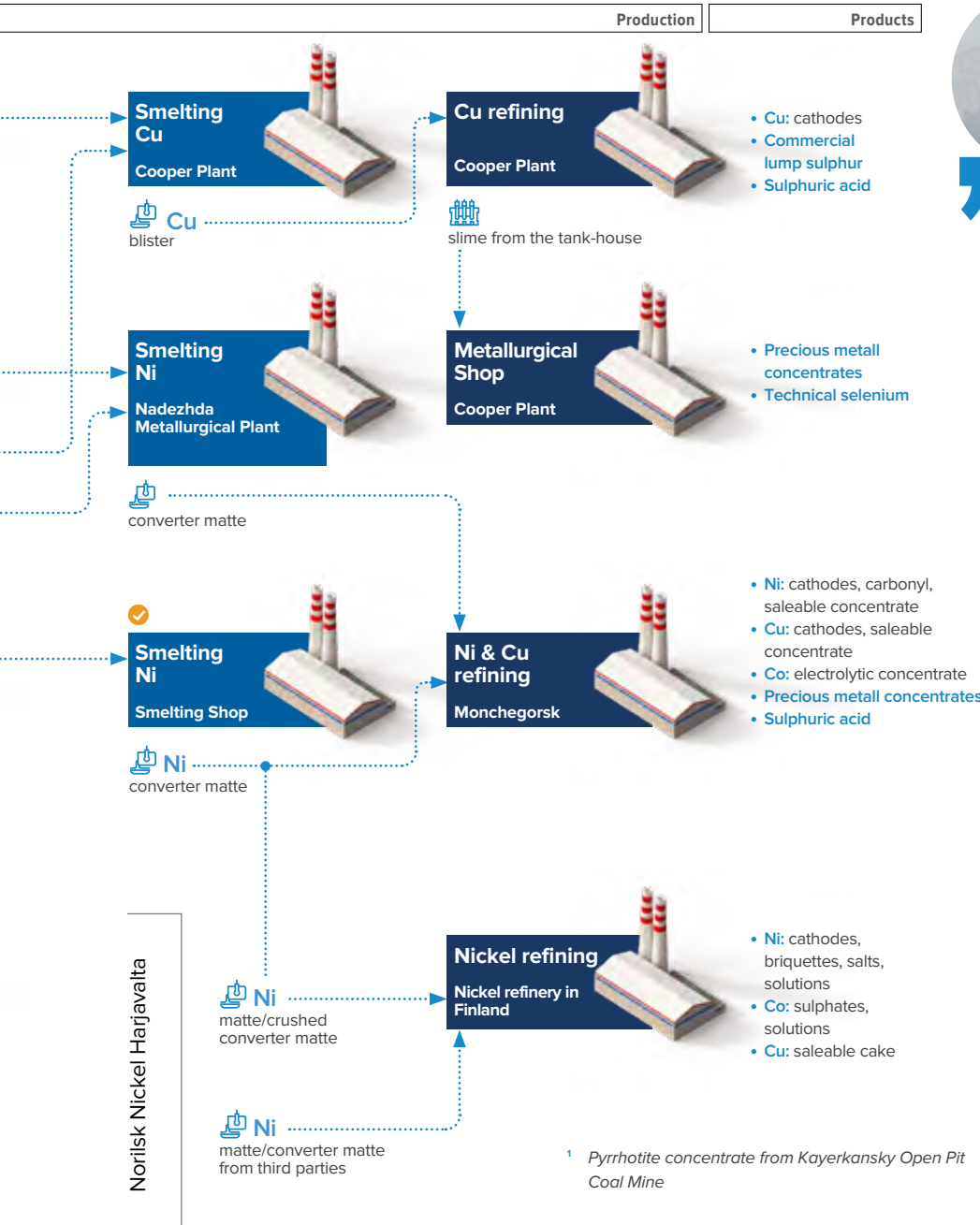
For more details, please see Key investment projects

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### Ore mined across Russian assets // mt



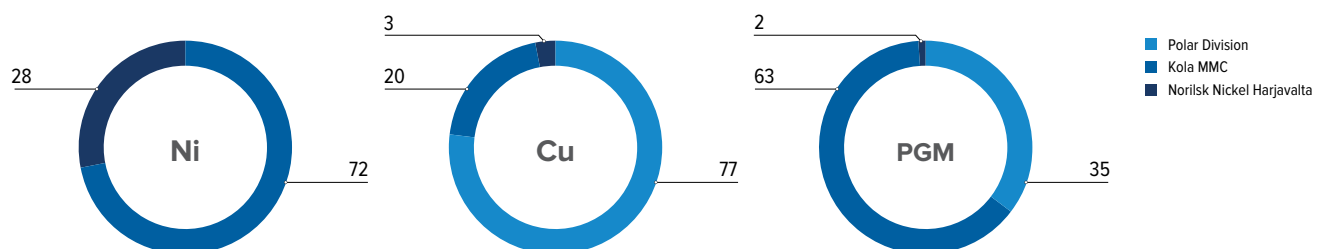


With the key stage of our reconfiguration effort completed, Talnakh Concentrator delivered stronger recovery rates and reached its design capacity while work-in-progress inventory levels normalised, allowing us to meet production targets for 2017. Our own feedstock metals production increased by 7–15% 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



<sup>1</sup> Pyrrhotite concentrate from Kayerkansky Open Pit Coal Mine

## Operating performance for 2017

### Ore mined across the Group // mt

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

### Average metal content

Asset	Nickel, %			Copper, %			PGM <sup>2</sup> , g/t		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
<b>Russia</b>									
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
<b>South Africa</b>									
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
<b>Russia</b>									
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	–	–	–
<b>South Africa</b>									
Nkomati (ore to concentrate)	74.1	70.6	70.7	86.1	89.5	90.9	–	–	–

<sup>1</sup> Volumes based on the 50% ownership (not included in the totals).

<sup>2</sup> 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
<b>Russia</b>									
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
<b>Finland</b>									
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
<b>Group total</b>			
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
<b>Russia</b>			
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
<b>Finland</b>			
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
<b>South Africa<sup>3</sup></b>			
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

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