

Permafrost thawing: loss of bearing capacity of soil under pile foundations can lead to deformation and subsequent collapse of buildings and structures.

Permafrost thawing

Category	Description
Key risk factors	Climate change, increase in average annual temperature over the last 15 to 20 years Increased depth of seasonal permafrost thawing.
Impact on Nornickel's development goal and strategy	Efficient delivery of finished products (metals) in line with the production programme. Timely supply of products to consumers. Social responsibility: comfort and safety of people living in Nornickel's regions of operation
Risk assessment	Impact on goals: medium. Source of risk: external. Year-on-year change in risk: none
Mitigation	The Company manages the risk through: <ul style="list-style-type: none"> Regular monitoring of soil condition under the foundations of buildings and structures built on permafrost Geodetic monitoring of buildings movement Measurements of soil temperatures under building foundations Monitoring the compliance of its facilities with operational requirements for crawl spaces Recommendations and corrective action plans to ensure safe operating conditions for buildings and structures

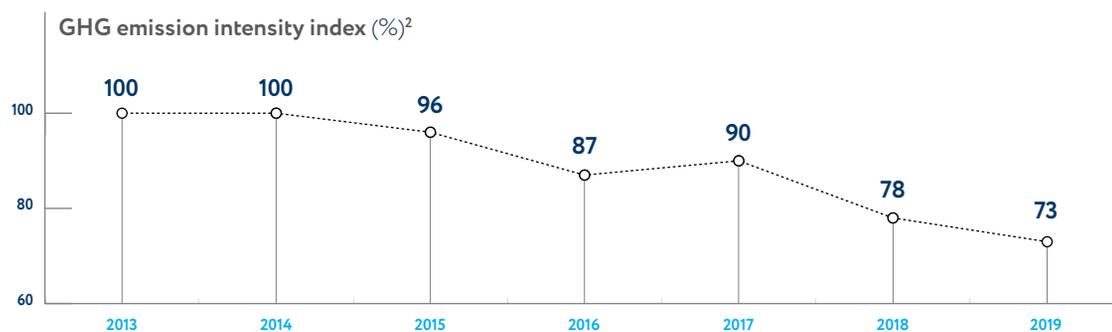
GHG EMISSIONS

Including its planned projects to upgrade and expand production facilities, and its major environmental performance improvement programme, Nornickel's ambition is to stabilise its annual greenhouse gas emissions at a level not exceeding 10 to 12 mln t of CO₂-equivalent.

GHG emissions (mln t of CO₂ equivalent)¹

Indicator	2017	2018	2019
Scope 1	10.2	9.9	9.8
Scope 2	0.1	0.1	0.1
Total emissions (Scope 1+2)	10.3	10.0	9.9

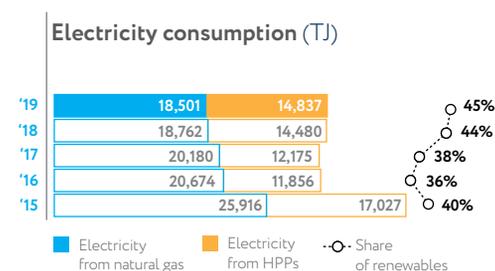
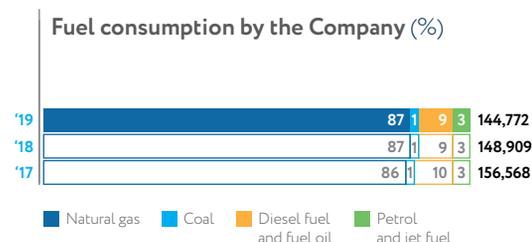
^{1/} The estimate was made in 2019 as per the GHG Protocol Guidelines and includes carbon dioxide (CO₂) and methane (CH₄) emissions).



USE OF RENEWABLES AND ENERGY EFFICIENCY

The Company sources energy locally, primarily from low-carbon natural gas and renewable energy sources, namely two hydropower plants. Diesel fuel, fuel oil, petrol and jet fuel are used by its transport assets. Use of high-carbon fuel by energy assets is minimised. Only small amounts of coal are used in certain production processes. As a result of Nickel Plant shutdown, estimated coal consumption declined by 40–70 ktpa.

The Company's priority energy source is hydropower generated by Ust-Khantayskaya and Kureyskaya HPPs. In 2019, renewables accounted for 45% of total electricity consumed by the Group and 54% of power consumption in the Norilsk Industrial District.



Group's electricity generation and electricity and fuel consumption (TJ)³

Indicator	2017	2018	2019
1. Fuel consumption by the Company ⁴	156,569	148,910	144,772
- natural gas	134,709	129,335	125,329
- diesel fuel and fuel oil	15,221	13,788	13,535
- petrol and jet fuel	5,178	4,127	3,820
- coal ⁵	1,460	1,660	2,087
2. Electricity and heat from own renewable sources (HPPs)	12,414	14,877	15,058
3. Electricity and heat purchased from third parties	10,483	10,931	11,331
4. Sales of electricity and heat to third parties	19,503	18,926	18,766
Total consumption of electricity and fuel (1 + 2 + 3 - 4)	159,962	155,792	152,395

^{2/} Carbon intensity index is calculated as carbon emissions per tonne of copper equivalent as a percentage relative to its level in 2013, assumed as 100%.

^{3/} For a detailed breakdown of the Group's energy consumption by company, please see the 2019 Sustainability Report.

^{4/} Including the fuel used to generate electricity for Norilsk.

^{5/} Coal is only used in production processes, with Kola MMC accounting for 45% of total consumption, GRK Bystrinskoye 27%, the Polar Division 13%, cement production 9%, and other subsidiaries 6%.