

## CLIMATE CHANGE

Climate change is a global problem of our day capable of having an adverse impact on the world community, as it will affect the biodiversity, reduce water and energy availability, and cause other environmental risks. GHG emissions are one of the key drivers of global warming and approaching climate change. Norilsk Nickel recognises the importance of fighting against climate change and supports global initiatives to reduce GHG emissions. The Company pursues its long-term development agenda through process upgrades using the best available technologies, improving its energy efficiency, increasing the share of green energy, and reducing the energy intensity of commercial production. Moreover, the Group is committed to the UN Global Compact Principles.

Norilsk Nickel's Board of Directors deals with climate change issues on a regular basis as part of discussions on the Company's Environmental Development Framework and progress reports on major investment projects, and treats them as a priority in setting Norilsk Nickel's targets and the development strategy. The First Vice President – Chief Operating Officer oversees climate change matters.

### Climate risks

The Company has always worked in harsh climatic conditions, including permafrost, seasonal ice melt, and extremely low temperatures. Operations in such environment historically took into account severe climate changes, which, to crown

it all, have a pronounced seasonal nature. Therefore, all structures were built on pilings, while industrial facilities are based on hard rock to avoid building decay.

Most supplies, including consumer goods, feedstock and materials for manufacture and construction, as well as social goods arrive at the Dudinka Port located 100 km from Norilsk and accessible to sea and river vessels alike. The Company is the Port owner. It is the world's only port that gets flooded every year during the spring thaw. Located in the Far North, the port operates a seasonal service: approximately from November to May its water area and the Yenisey basin freeze. During this period, Dudinka Port handles only sea vessels using port icebreakers to de-ice the berths and provide support during manoeuvring and mooring operations. In May and June, during the flooding, the service is suspended. When ice drift passes and water level goes down, the Company promptly restores the operability of berths using its unique proprietary technology.

The Company's power supplies are also adjusted for climate conditions. The Company uses neither solar nor wind power because of violent winds and long polar nights during the winter period, but it makes a good use of green hydropower. Norilsk Nickel operates two hydropower plants covering 44% of its energy needs. The Company has established fuel-based backup generating capacity to be used in the event of drought or decline in hydropower plant output.

**CO<sub>2</sub> emissions totalled**

**10** mt

**Renewable energy sources provide**

**44%** of electricity consumed

## 2018 milestones

### Sulphur Project kick-off.

In September, Copper Plant officially kicked off the Sulphur Project, Norilsk Nickel's most ambitious initiative to dramatically improve local environment. The official ceremony was attended by Vladimir Potanin, Norilsk Nickel's President, and Sergey Menyaylo, the Russian President's Plenipotentiary Representative to the Siberian Federal District.

### Dialogue with stakeholders.

Experts from Russia and Norway discussed environmental initiatives.

Norilsk Nickel's representatives furnished their Norwegian colleagues with data on reduction of the Company's environmental footprint in Norilsk and on the Kola Peninsula and shared details of the large-scale Sulphur Project, which targets a 75% reduction in sulphur dioxide emissions in the Norilsk Industrial District by 2023.

**Share of coal in fuel consumed stands**

**at 1.1%**



### Key climate change risks

Risk type	Risk description	Key risk factors	Risk mitigation activities
Climate change risks	<b>Lack of water resources:</b> water shortages in storage reservoirs of the Company's hydropower facilities may result in failure to achieve necessary water pressure at HPP turbines leading to limited power production and drinking water shortages in the Norilsk Municipality territory	Abnormal natural phenomena (drought) caused by climate change	<ul style="list-style-type: none"> <li>Establish closed water circuit to reduce water withdrawal.</li> <li>Use a hydrological monitoring system on a regular basis to forecast water level in rivers and water bodies.</li> <li>Cooperate with Roshydromet to set up permanent hydrological and meteorological monitoring stations and improve the accuracy of water level forecasts in rivers where the Company operates.</li> <li>Dredge the Norilskaya river and reduce energy consumption at the production facilities, should the risk materialise.</li> <li>Replace equipment at hydropower plants to increase power output through improving the performance of hydroelectric units (implemented in 2012–2021)</li> </ul>
	<b>Soil thawing:</b> loss of bearing capacity of pile foundations, deformation of buildings and structures leading to their destruction	Climate change, average annual temperature increase (over the last 15–20 years). Increased depth of seasonal thawing	<ul style="list-style-type: none"> <li>Erect buildings and structures on soil or hard rock</li> <li>Regularly monitor the condition of foundation beds for buildings and structures built on permafrost</li> <li>Run geodetic control of changes in buildings' positions</li> <li>Monitor soil temperature at buildings' foundations</li> <li>Monitor the facilities' compliance with operational requirements for crawlspaces</li> <li>Develop recommendations and corrective action plans to ensure safe operating conditions for buildings and structures</li> </ul>