

# CLIMATE CHANGE

Nornickel closely monitors for global initiatives to reduce greenhouse gas emissions and is developing a strategy to manage the Company's impact on climate change.

The Company also has a long-term development strategy providing for the modernisation of its production assets through the deployment of best available technologies, improvement of energy efficiency, energy saving, and energy intensity reduction. The Company's strategy takes into account key non-financial risks, including climate risk, as well as current trends in this space.

Nornickel's Board of Directors considers climate change issues as a matter of priority and includes them in its discussions of the Company's environmental strategy. The climate change matters are also high on the Company's strategic and operational agendas and overseen by the First Vice President – Chief Operating Officer.

In 2019, the Company set up a working group including its Vice Presidents to monitor environmental programmes and initiatives including ones related to climate change. The group is led by Gareth Penny, Chairman of the Board of Directors.

## CLIMATE RISK MANAGEMENT

Global warming and other consequences of climate change may affect the Company's operations in the longer run. Their impact may include abnormal weather or lasting changes in weather patterns. Physical consequences of climate change can include droughts and permafrost thawing, which can have a material adverse effect on Nornickel's operations.

9.9  
mln t

totalled CO<sub>2</sub> emissions (Scope 1+2),  
the lowest level among global majors

As part of its risk management strategy, Nornickel implements a range of measures to monitor and control these risks. These activities enable Nornickel to keep climate risks at an acceptable level. Occurrence of climate risks may also unlock additional opportunities for Nornickel, driven by a strong demand for metals essential for the development of a low-carbon economy:

Furthermore, the metals produced by the Company are widely used in transition to low-carbon economy: platinum group metals (PGMs) are used in auto catalytic converters, nickel is a key component in EV batteries, and copper is used in EV charging infrastructure.

Hydropower is the main source of renewable energy for the Company. The use of other renewables such as solar, geothermal, and wind energy is limited, as Nornickel's main production assets are located north of the Arctic Circle in harsh climatic conditions.

Since its establishment in 1935, the Company has been developing in these challenging climatic conditions and had to consider them in building its energy assets, relying on low-carbon fuels, i.e. natural gas (about 90% of the energy mix), and renewable hydropower (about 10%).

1/

45%

Share of electricity from renewable sources was 45% in 2019

### KEY CLIMATE CHANGE RISKS

**Insufficient water resources:** water shortages in storage reservoirs of Nornickel's hydropower facilities may result in insufficient water head at HPP turbines leading to lower power output as well as drinking water shortages in Norilsk.

#### HARSH CLIMATIC CONDITIONS OF THE ARCTIC CIRCLE



Air temperatures stay below freezing point for about eight months a year



Strong gusts of wind with speeds of up to 50 m/s are followed by dead calms lasting for weeks



Polar nights and twilights last for more than 100 days



On average, there are no more than 70 sunny days per year



Permafrost is 300 to 500 metres deep



Soils and ice are prone to seasonal thawing

#### Insufficient water resources

| Category  | Description   |
|---|---|
| Key risk factors                                    | Extreme weather events (droughts) caused by climate change  |
| 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.<br>Source of risk: external.<br>Year-on-year change in risk: none  |
| Mitigation  | The Company manages the risk through: <ul style="list-style-type: none"> <li>• Closed water circuits to reduce water withdrawal from external sources</li> <li>• Regular hydrological observations to forecast water levels in rivers and other water bodies</li> <li>• Cooperation with the Federal Service for Hydrometeorology and Environmental Monitoring (Rosgidromet) in setting up permanent hydrological and meteorological monitoring stations to improve the accuracy of water level forecasts for major rivers across Nornickel's regions of operation</li> <li>• Dredging the Norilskaya River and reducing energy consumption at production facilities in case of risk occurrence</li> <li>• Replacing hydropower plant equipment to increase electricity output through improving the efficiency of hydropower units (implementation period: 2012–2021)</li> </ul> |

**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.<br>Source of risk: external.<br>Year-on-year change in risk: none  |
| Mitigation  | The Company manages the risk through: <ul style="list-style-type: none"> <li>Regular monitoring of soil condition under the foundations of buildings and structures built on permafrost</li> <li>Geodetic monitoring of buildings movement</li> <li>Measurements of soil temperatures under building foundations</li> <li>Monitoring the compliance of its facilities with operational requirements for crawl spaces</li> <li>Recommendations and corrective action plans to ensure safe operating conditions for buildings and structures</li> </ul> |

## 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 CO<sub>2</sub>-equivalent.

### GHG emissions (mln t of CO<sub>2</sub> equivalent)<sup>1</sup>

| 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  |

<sup>1/</sup> The estimate was made in 2019 as per the GHG Protocol Guidelines and includes carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) emissions).