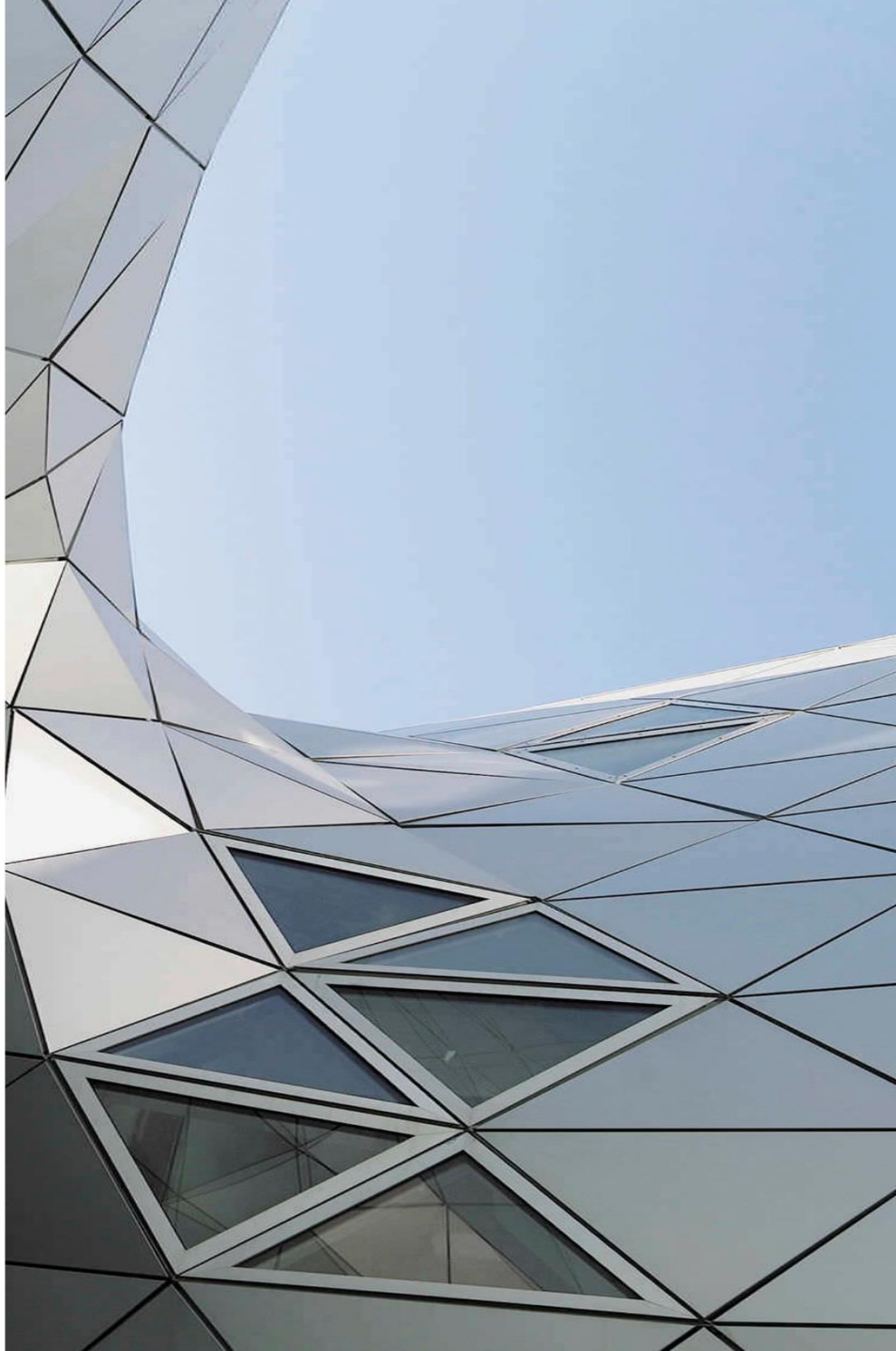
GROUP

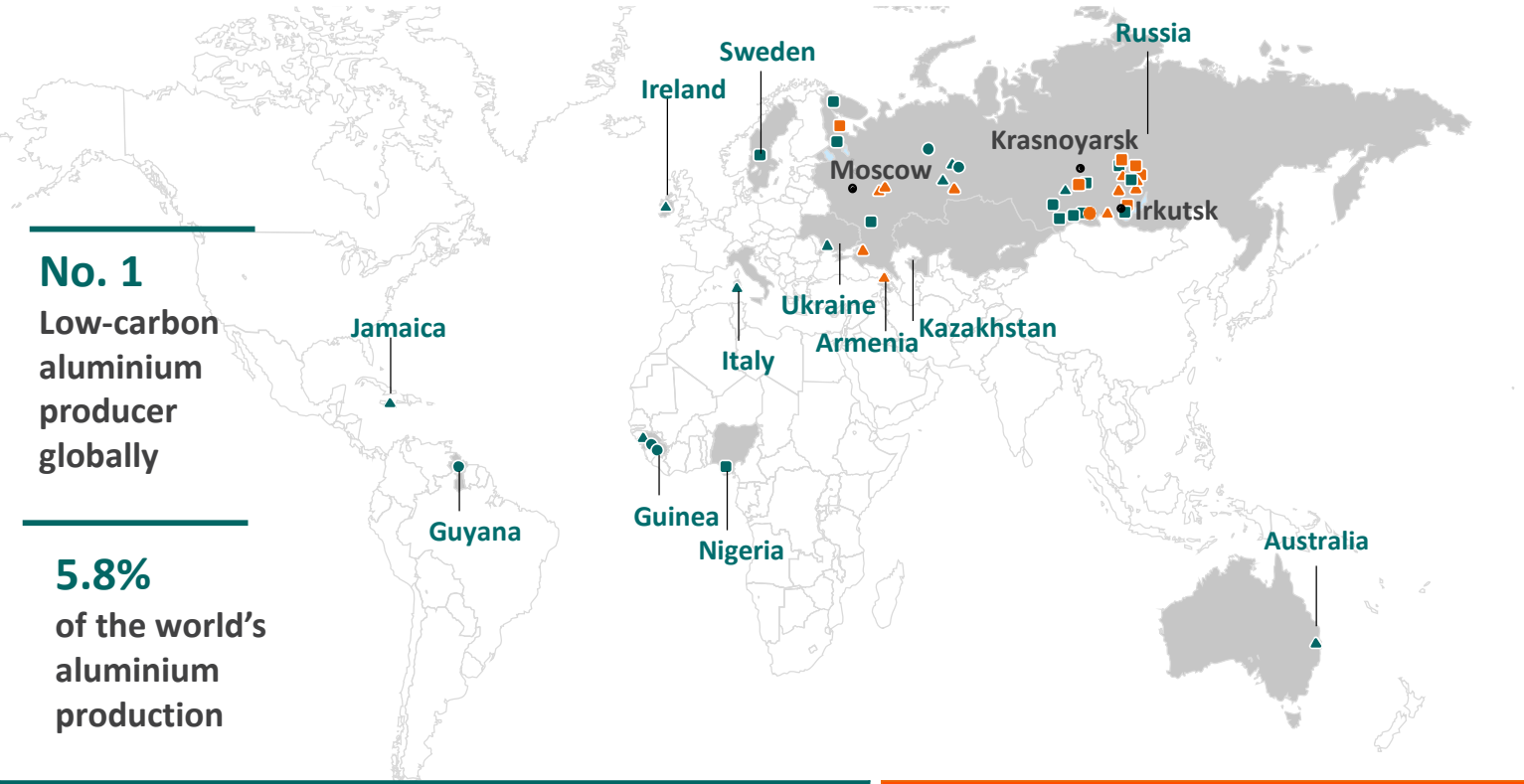
# Rational use of water resources under climate change

December 2019



# En+ Group Global Operations

**En+ Group is a global leader in aluminium production and renewable power with a well-established presence across five continents, a strong operational hub in Siberia**




**No. 1**
**Low-carbon aluminium producer globally**

**5.8%**
**of the world's aluminium production**


## Metals segment

| Aluminium | Alumina | Bauxite |
|---|---|---|
| **12** aluminium smelters | **9** alumina refineries | **7** bauxite mines |
| Total capacity: **3.9 mtpa** | Total capacity: **10.4 mtpa** | Total capacity: **20.6 mtpa** |
| Production in 2018: **3.8 mt** | Production in 2018: **7.8 mt** | Production in 2018: **13.8 mt** |

## Power segment

| Hydropower | Thermal power | Solar |
|---|---|---|
| **5** hydro power plants (HPP) | **16** combined heat and power plants (CHP) | **1** Solar power plant (SPP) |
| Total capacity: **15.1 GW** | Total capacity: **4.5 GW** | Total capacity: **5.2 MW** |
| Production in 2018: **58.3 TWh** | Production in 2018: **14.9 TWh** | Production in 2018: **6 GWh** |

- Hydro Power Plants
- Aluminium smelter
- Aluminium smelter development project
- Krasnoyarsk Metallurgical Plant (KraMZ)

(1) A 50%/50% JV of Rusal and RusHydro, comprising Boguchansk aluminium smelter and Boguchansk HPP. Boguchansk HPP is operated by RusHydro

# Sustainable Water Management in Siberia

With climate change becoming a global problem, scientists' forecasts are worrying.

Global warming, and melting permafrost can cause significant economic, environmental, and social problems.

En+ Group considers it important to ensure rational use of water resources, in order to assure safety for:

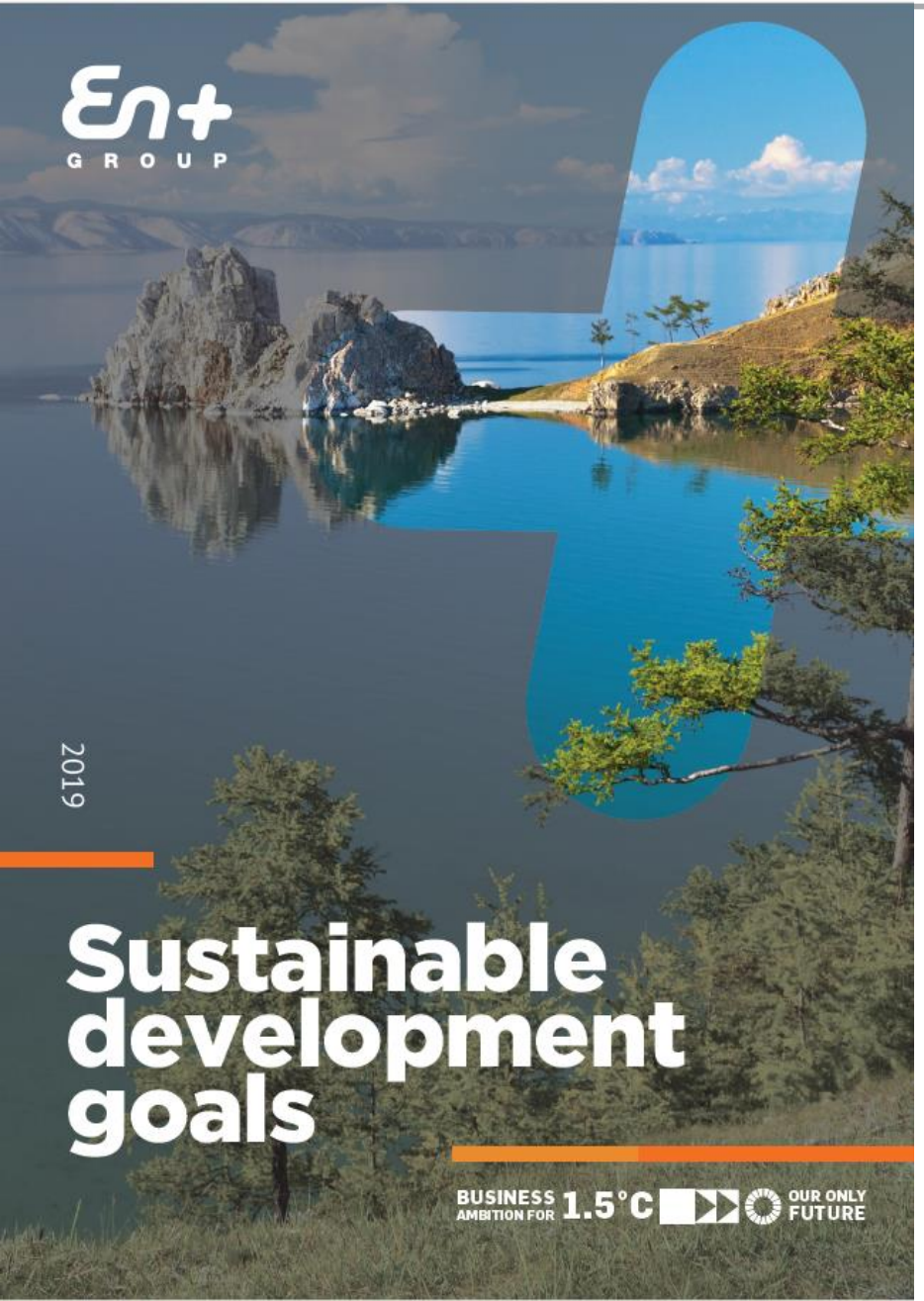
- local communities
- Surrounding ecosystems

*IPCC Special Report on Ocean and the Cryosphere* calls for –

**Mitigation**: Renewable energy, energy efficiency, restoring vegetation

**Adaptation**: For community and infrastructure

# Key Sustainable Development Goals





*Ensure healthy lives and promote well-being for all ages*


*Ensure availability and sustainable management of water and sanitation for all*


*Ensure access to affordable, reliable, sustainable and modern energy for all*


*Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*


*Ensure sustainable consumption and production patterns*


*Take urgent action to combat climate change and its impacts*


*Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

# En+ Group is supporting both mitigation and adaptation

## SCIENTIFIC RESEARCH

- Studies of the state of Lake Baikal
- Study of the response of the aquatic ecosystems to changes resulting from climate change
- Study of the content and distribution of microplastics in freshwater bodies
- Measurement of GHG emissions from the surface of reservoirs

**Study and Monitoring**

## DIGITAL FORECASTING

- Development of a model for predicting water inflow into Lake Baikal, based on BIG DATA
- An algorithm will account for factors affecting the water inflow into Lake Baikal, and will allow to obtain a forecast for a period of 6 to 18 months.
- The program will optimize the use of water resources, help minimize the environmental impact, while taking into account the needs of local communities.

**Forecasting**

## WATER RESOURCE REGULATION

- Compliance with all regulatory requirements established by local authorities and the government of the Russian Federation.
- Monitoring of flood risks and threats to safety to coastal settlements.
- Monitoring reservoir water levels and HPP cascade operation with the use of the corporate Analytical Center

**Safety Provision**

## EQUIPMENT UPGRADE AND OPTIMIZATION

- Increase in energy production by 2.3 billion kWh per year with the same volume of water
- Reduction of GHG emissions by 2.6 million tons of $CO_2$ per year by 2050
- Elimination of turbine oil leakage into water bodies.

**Reducing impact on Climate**

# Global Collaboration – Aluminium for Climate

En + Group joined the UN Global Compact in July 2019, demonstrating its commitment to 10 principles of the Global Compact regarding environmental protection, human rights, labor protection and anti-corruption.
En+ Group pledged to publish annual reports on ongoing efforts to implement the 10 principles and to collaborate with industry peers and stakeholders to drive progress towards these fundamental values.

En+ Group joined ETC in July 2019. The Group supports ETC research into development of a strategy to significantly reduce carbon emissions in heavy industry and collaborates with other ETC members to identify the most effective joint actions to achieve these goals.

En+ Group joined the Business Ambition for 1.5°C in September and committed to developing a program of science-based emissions reduction targets (or "SBTi") aligned to a net-zero future over the next 24 months.

En+ Group collaborates with ETC and the World Economic Forum on the "Aluminium for Climate" initiative. Aluminium for Climate is working on a market strategy, creating a roadmap for reducing GHG emissions, and contributing to the development of new effective technological and new market solutions.

# Allow- the product of clean hydro-energy

## ALLOW FOR A BETTER FUTURE

**RUSAL's ALLOW aluminium empowers our customers to reduce the carbon footprint of their products**

In a carbon-constrained world the future of aluminium is ALLOW

- ALLOW enables our customers to contribute to their climate change strategy.
- ALLOW aluminium is made from renewable hydropower and it enables our customers to deliver products with a lower $CO_2$ footprint to make a positive impact for society.

RUSAL offers to its clients independently verified carbon footprint statements from the smelter of origin to perform Life-cycle assessments of products

Allow