’Green’ technologies & standards in building and construction

with ALLOW, low-CO_2 aluminium by RUSAL

Presentation for AlumForum webinar Russia-Germany Aluminium in Architecture and Construction. Aluminium Bridges

18 November 2020

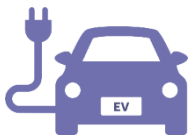
Aluminium: cornerstone material for post-COVID ‘green’ recovery

…light, durable, fully and almost infinitely recyclable

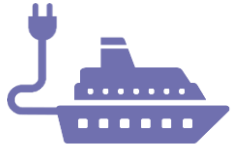
POST-COVID REALITY

- CLIMATE EMERGENCY: INACTION IS NOT AN OPTION
- GOVERNMENTS INVEST IN E-MOBILITY, GREEN BUILDINGS, RENEWABLES, CIRCULAR PACKAGING
- INVESTORS AND CUSTOMERS INCREASE SCRUTINY OF PRODUCERS’ ESG
- PRODUCERS PUSH FOR REDUCED SOCIO-ENVIRONMENTAL IMPACTS & MINIMIZED CARBON FOOTPRINT

DECARBONISATION



e-vehicles



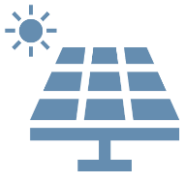
e- ferries

e-two-wheelers

ENERGY-EFFICIENCY

wind

hydro power



solar

CIRCULARITY

reuse & recycling

sustainable building & construction

efficient technologies

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Building and construction: key sector for sustainable recovery

…it accounts for 30 % of global energy use and 39 % of global energy-related CO2 emissions

GOALS AND SOLUTIONS

CARBON FOOTPRINT TRANSPARENCY

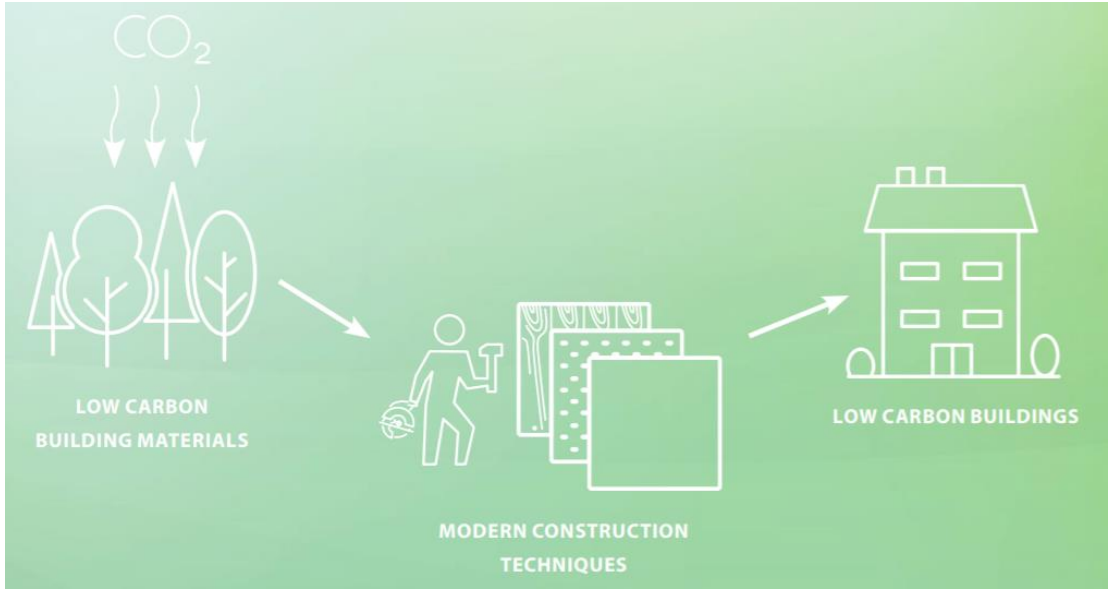
Common language for actors in built environment

DECARBONIZE

Retrofits, more efficient technologies (digital), **low-carbon materials**

GREATER RESILIENCE & SUSTAINABILITY

'Green' jobs, healthier built environment, lower environmental impacts



*…all **new** buildings to operate at **net-zero emissions by 2030** at the latest, and for **all** buildings to operate at **net zero by 2050***

'GREENER' CONSTRUCTION MAKES BUSINESS SENSE

- INCREASED OPERATIONAL EFFICIENCY: -14% costs over 5 years lifecycle
- REDUCED ROI TIMELINE: under 5-10 years
- INCREASED ASSET VALUE: +10% vs traditional buildings
- INCREASED QUALITY: lower utilities bills, improved compliance, higher quality

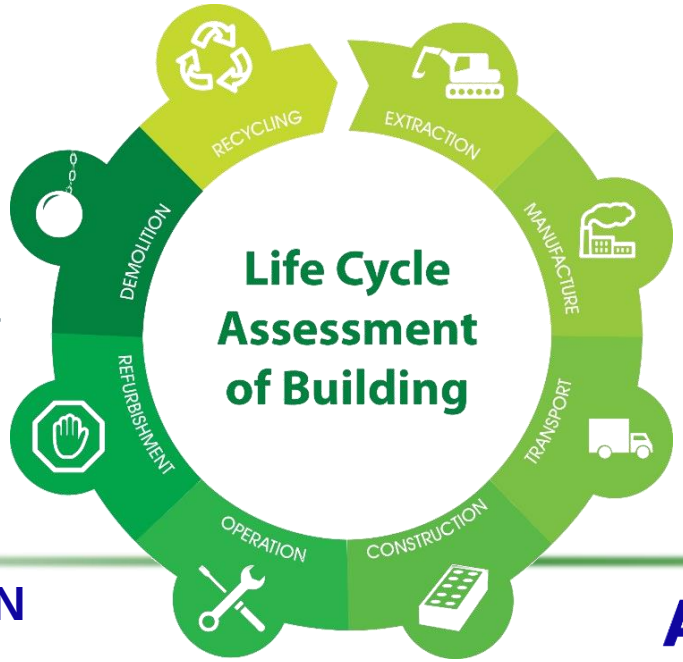
Sources: IEA, WBCSD, Building System Carbon Framework

Low-carbon aluminium supports sustainable recovery and creates added value

…by reducing carbon footprint, improving transparency/quality assurance in building and construction

CONTRIBUTES TO LIFECYCLE ASSESSMENTS

Stakeholders
demanding transparency
when it comes to carbon footprint and other environmental impacts



INDEPENDENTLY VERIFIED CARBON FOOTPRINT

TÜV AUSTRIA

traceable to individual smelter to calculate total emissions throughout entire supply chain

SUPPORTS EMISSIONS REDUCTION EFFORTS

11%
of Global CO2

construction

World Green Building Council called construction sector to **reduce** embodied **carbon by 40 % by 2030***

Allow LOW-CARBON ALUMINIUM

crafted with renewable hydro power

with carbon footprint

<4	<8
Scope 1&2	Full scope

RUSAL to produce 100% aluminium with 95% carbon-free energy by 2025

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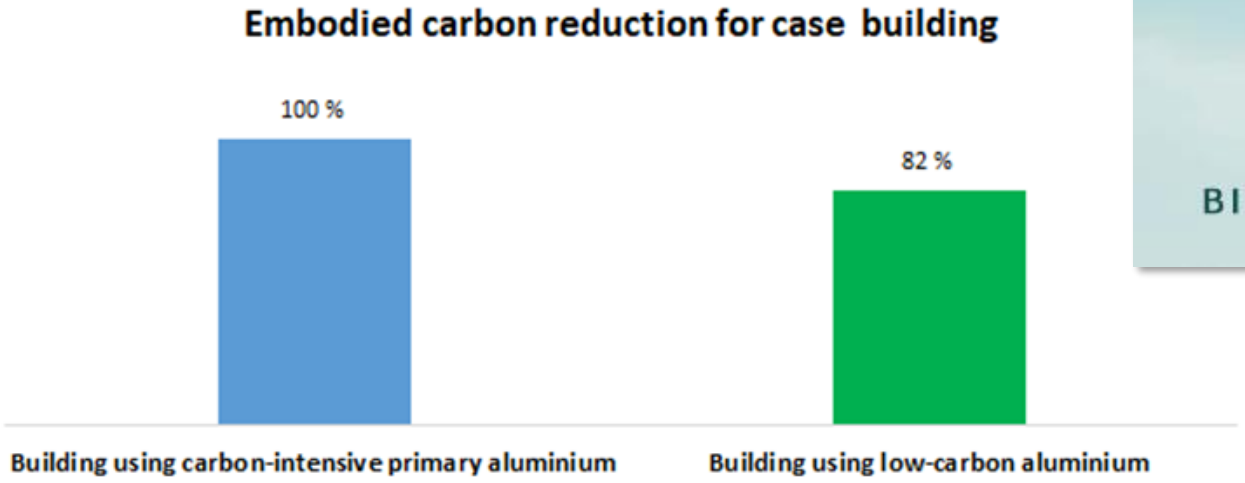
**World Green Building Council Bringing Embodied Carbon Upfront Report*

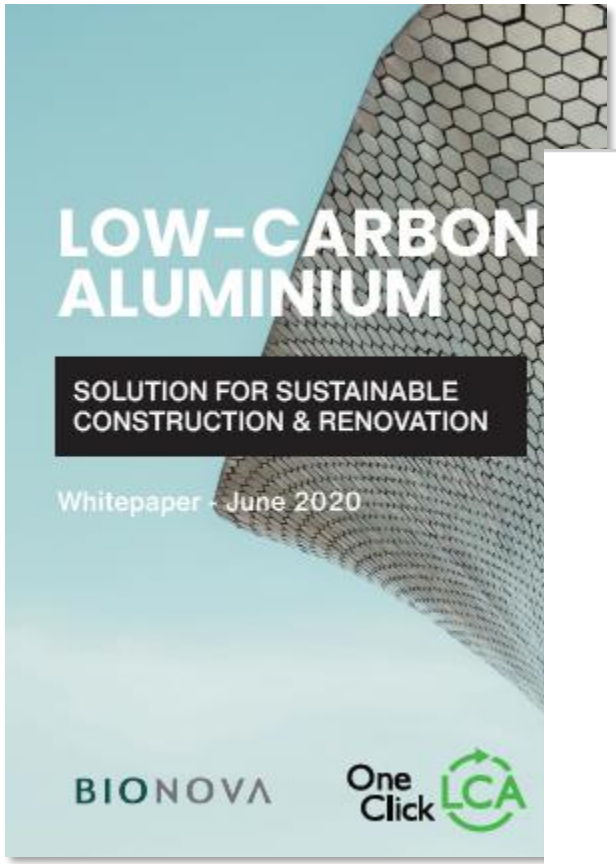
Low-carbon aluminium supports sustainable recovery and creates added value

…by reducing embodied carbon in building and construction sector

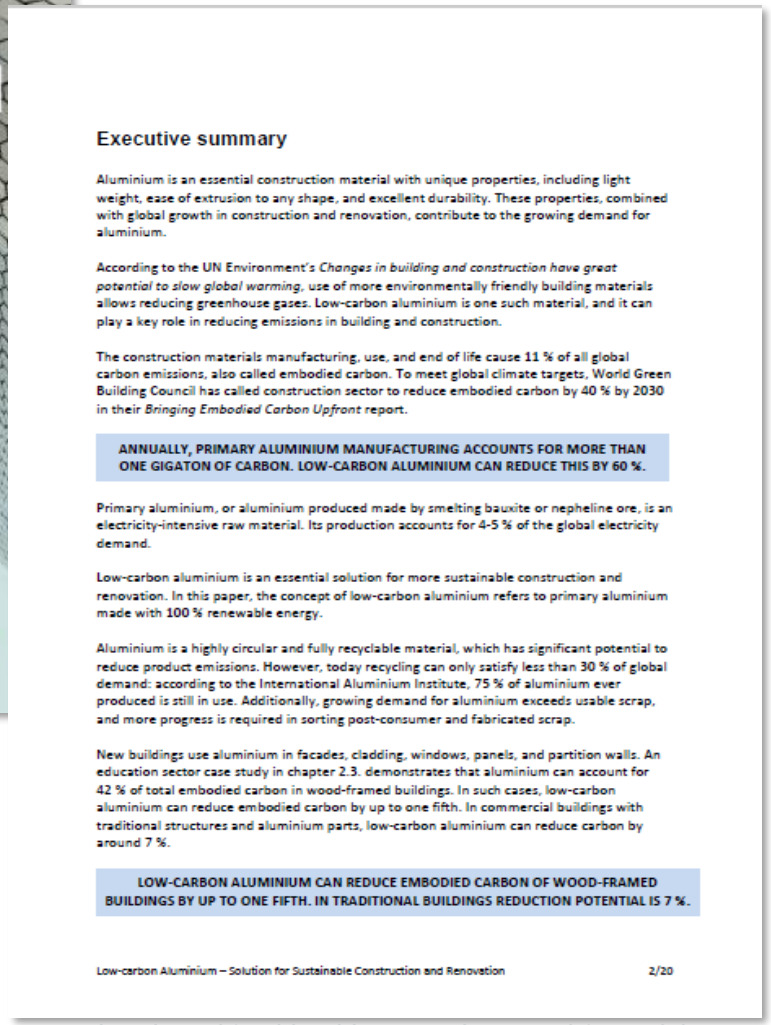
Aluminium can account for **42 %** of total embodied carbon in wood-framed buildings.

Use of low-carbon aluminium can reduce embodied carbon of buildings by up to **20 %**
In commercial buildings with traditional structures and aluminium parts made with low-carbon aluminium can reduce carbon footprint by **7 %**





#buildbackbetter



Executive summary

Aluminium is an essential construction material with unique properties, including light weight, ease of extrusion to any shape, and excellent durability. These properties, combined with global growth in construction and renovation, contribute to the growing demand for aluminium.

According to the UN Environment's *Changes in building and construction have great potential to slow global warming*, use of more environmentally friendly building materials allows reducing greenhouse gases. Low-carbon aluminium is one such material, and it can play a key role in reducing emissions in building and construction.

The construction materials manufacturing, use, and end of life cause 11 % of all global carbon emissions, also called embodied carbon. To meet global climate targets, World Green Building Council has called construction sector to reduce embodied carbon by 40 % by 2030 in their *Bringing Embodied Carbon Upfront* report.

ANNUALLY, PRIMARY ALUMINIUM MANUFACTURING ACCOUNTS FOR MORE THAN ONE GIGATON OF CARBON. LOW-CARBON ALUMINIUM CAN REDUCE THIS BY 60 %.

Primary aluminium, or aluminium produced made by smelting bauxite or nepheline ore, is an electricity-intensive raw material. Its production accounts for 4-5 % of the global electricity demand.

Low-carbon aluminium is an essential solution for more sustainable construction and renovation. In this paper, the concept of low-carbon aluminium refers to primary aluminium made with 100 % renewable energy.

Aluminium is a highly circular and fully recyclable material, which has significant potential to reduce product emissions. However, today recycling can only satisfy less than 30 % of global demand: according to the International Aluminium Institute, 75 % of aluminium ever produced is still in use. Additionally, growing demand for aluminium exceeds usable scrap, and more progress is required in sorting post-consumer and fabricated scrap.

New buildings use aluminium in facades, cladding, windows, panels, and partition walls. An education sector case study in chapter 2.3. demonstrates that aluminium can account for 42 % of total embodied carbon in wood-framed buildings. In such cases, low-carbon aluminium can reduce embodied carbon by up to one fifth. In commercial buildings with traditional structures and aluminium parts, low-carbon aluminium can reduce carbon by around 7 %.

LOW-CARBON ALUMINIUM CAN REDUCE EMBODIED CARBON OF WOOD-FRAMED BUILDINGS BY UP TO ONE FIFTH. IN TRADITIONAL BUILDINGS REDUCTION POTENTIAL IS 7 %.

Low-carbon Aluminium – Solution for Sustainable Construction and Renovation 2/20

**From white paper by Bionova Ltd, independent firm of construction carbon specialists operating globally out of Finland. The case study selected for this white paper is a wood-framed, low-carbon educational building located in the United States (https://www.oneclicklca.com/whitepaper-low-carbon-aluminium-solution-for-sustainable-construction-and-renovation/)*

Measuring and optimizing embodied carbon

…becoming a standard requirement in ‘green’ building rating systems

LOW-CARBON ALUMINIUM: CERTIFICATION CREDITS & IMPROVED COMPLIANCE

Investors require ‘green’ building certification systems, such as *LEED v4.0 & 4.1*

Procurement of low-carbon construction materials

- *1 credit* • Embodied carbon of procured materials is below market average
- *2 credits* • Overall materials carbon reduction 30 % of nominal benchmark

Building lifecycle impact reduction:

- *1-4 credits* • Whole-Building Lifecycle Assessment:
  - *2 credits* • 5% GHG reductions against project’s baseline design
  - *3 credits* • 10% GHG reductions against project’s baseline design
  - 4 credits • 20% GHG reductions against project’s baseline design
  - *other environmental impact categories reduce their impacts, too*

Building product disclosure and optimization:

- *1 credit* • Environmental product declarations (EPDs)
- *1 credit* • Multi-Attribute optimization: products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project
- *1 credit* • Raw material source and extraction reporting
- *1 credit* • Material ingredient reporting and optimisation

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Lifecycle assessments (LCA/LCI) increasingly demanded by leading developers

…independently verified transparent and comparable labelling of product's lifecycle environmental impacts

PCR

Product Category Rules - Set of specific rules, requirements, and guidelines for developing Type III environmental product declarations for one or more product categories (ISO 14025)

LCA

Life Cycle Assessment - Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle (ISO 14044)

EPD

Environmental Product Declaration – Providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information (ISO 14025)

RUSAL will have EN15804-compliant EPD for its ALLOW metal by end 2020

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RUSAL is the largest producer of low-carbon aluminium

...and continues decarbonizing as part of broader sustainability agenda

> 80% of RUSAL aluminium was low-carbon in 2019

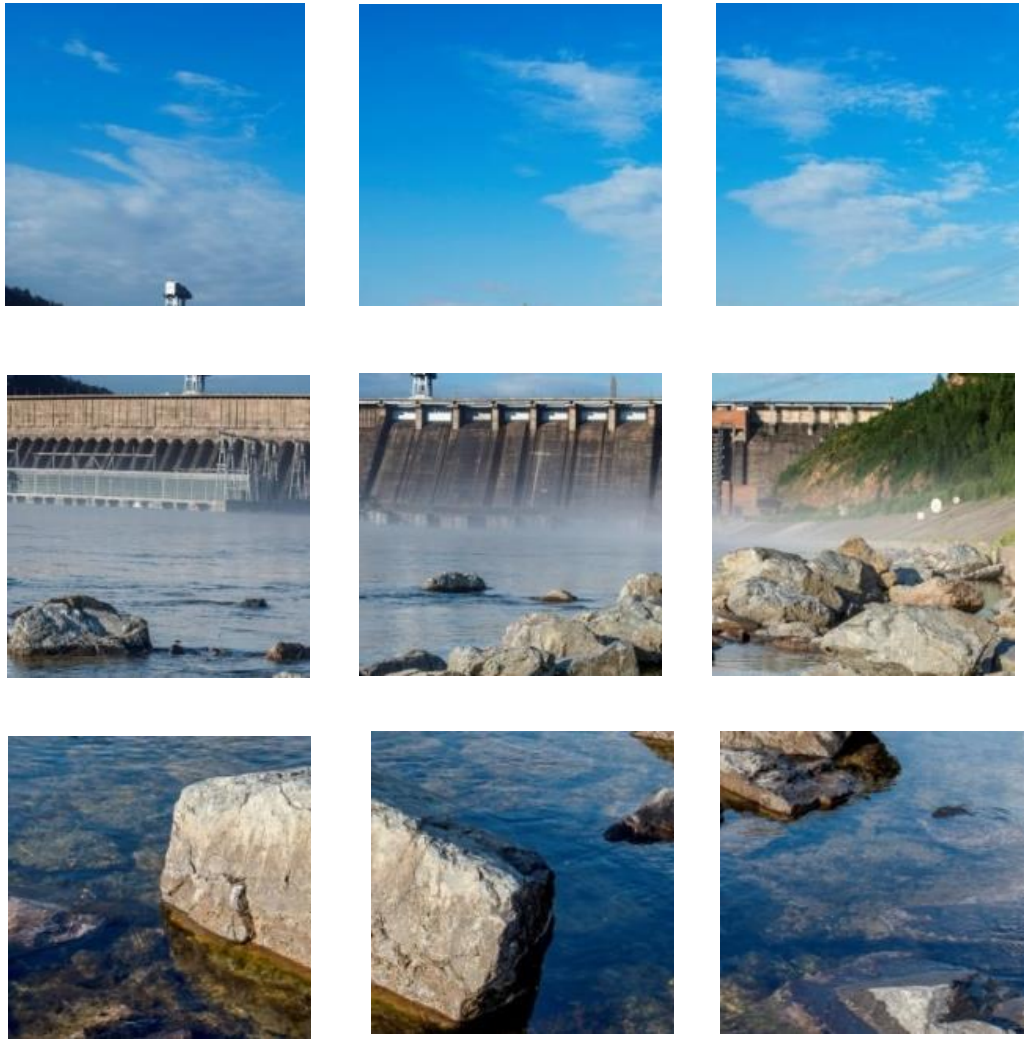
> 98% of RUSAL aluminium was produced using carbon-free power in 2019

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

SBTs commitment by end 2021

- 15% specific GHG emissions reduction by 2025
at smelters

- 7% specific power consumption reduction by 2025
at smelters



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aluminium crafted by hydro power

RUSAL

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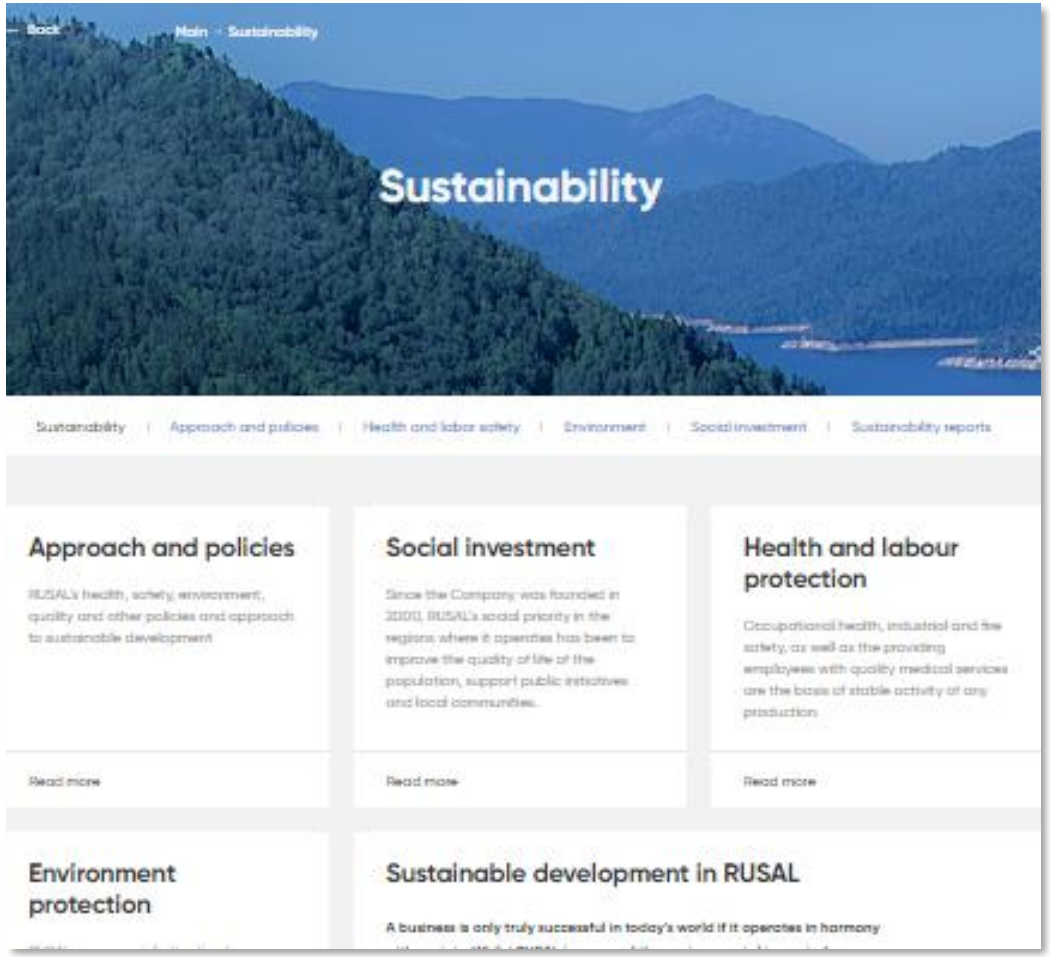
RUSAL's sustainability commitments and policies are publicly available at https://rusal.ru/en/sustainability/

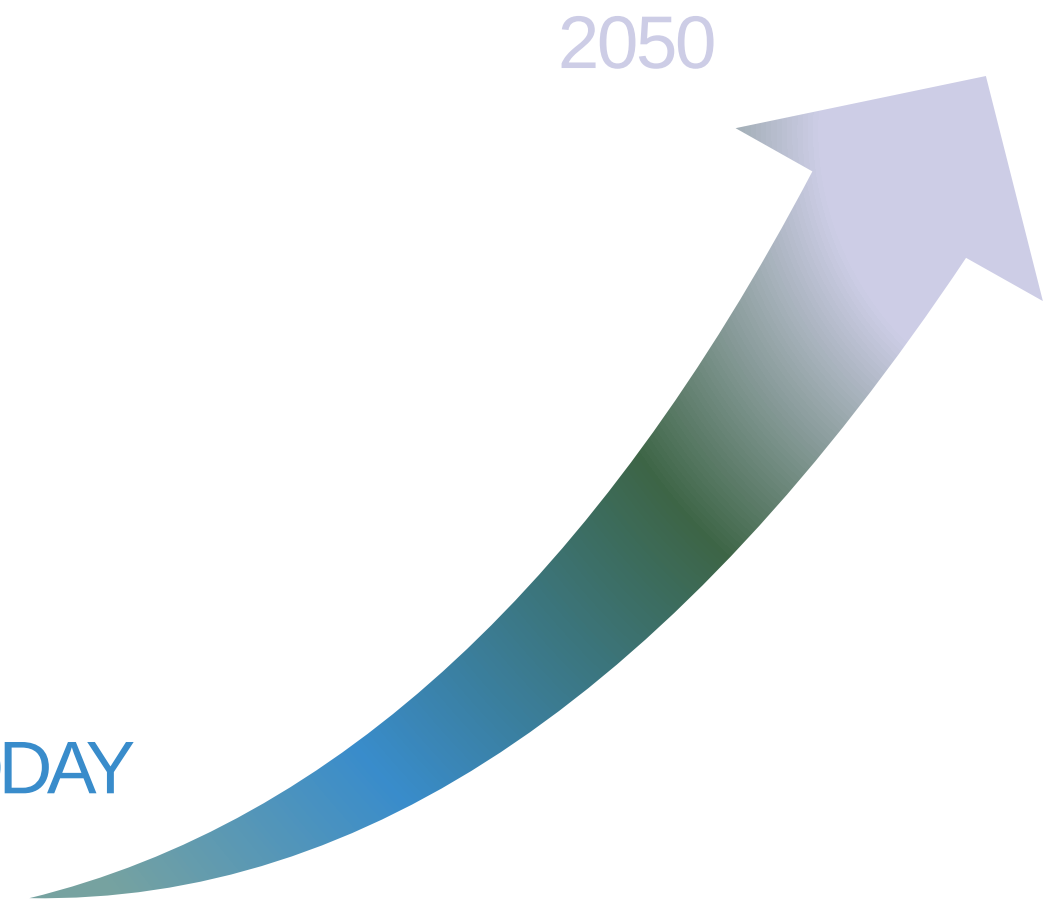


- Sustainability reports, UNGC reports, CDP disclosures
- Corporate ESG codes, policies, and regulations:
  Code of Conduct; Code of Corporate Ethics;
  HR Management Policy; Anti-Corruption Policy;
  Conflict of Interests Prevention and Settlement Regulations;
  Fraud Prevention Policy; Health (incl. OHSAS 18001),
  Occupational and Fire Safety Policy; Environmental Policy
- Environmental protection compliance:
  ISO 14001: 2015 environmental management system
- Declaration of DRC Conflict Minerals Free manufacturer: https://rusal.ru/clients/Declaration%20EICC.pdf
- Consistently improving EcoVadis rating:

RUSAL was awarded a bronze medal in the EcoVadis Sustainability rating 2020. The Company improved its performance compared to the previous audit three years ago.

Going to zero carbon: a game changer for the aluminium industry

…and the most urgent priority in the global sustainability agenda



	“ZERO” CARBON ALUMINIUM	2050
	“LOW CARBON” PRIMARY ALUMINIUM	RECYCLED / REUSED ALUMINIUM
	INDUSTRY AVERAGE 16.5 T CO2/T AL	WORLD: 25% LOW-CARBON ALU 75% HIGH-CARBON ALU

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