

TCFD report
2023

northvolt

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This is Northvolt

Founded in 2016 to enable the transition to a decarbonized future by supplying sustainable lithium-ion batteries.

In leading the development of a new and critical battery industry for Europe, Northvolt is determined to set a new benchmark for sustainability in the industry. To deliver on this ambition, and to do so at scale and at speed, Northvolt has taken the unique approach of integrating the battery value chain, including cathode production, cell manufacturing and recycling, into its own operations.

As a pioneer of sustainable battery manufacturing, we are taking a holistic approach to identifying, managing and

reducing negative impacts throughout our business.

Through our work so far, we know that we are on the right path. With sustainable raw materials suppliers, use of fossil-free energy, increased circularity, resource efficiency and the use of recycled material, we can massively reduce the carbon footprint of our batteries. Creating a sustainable battery company takes time, but we are determined honor our commitment to sustainability.

About this report

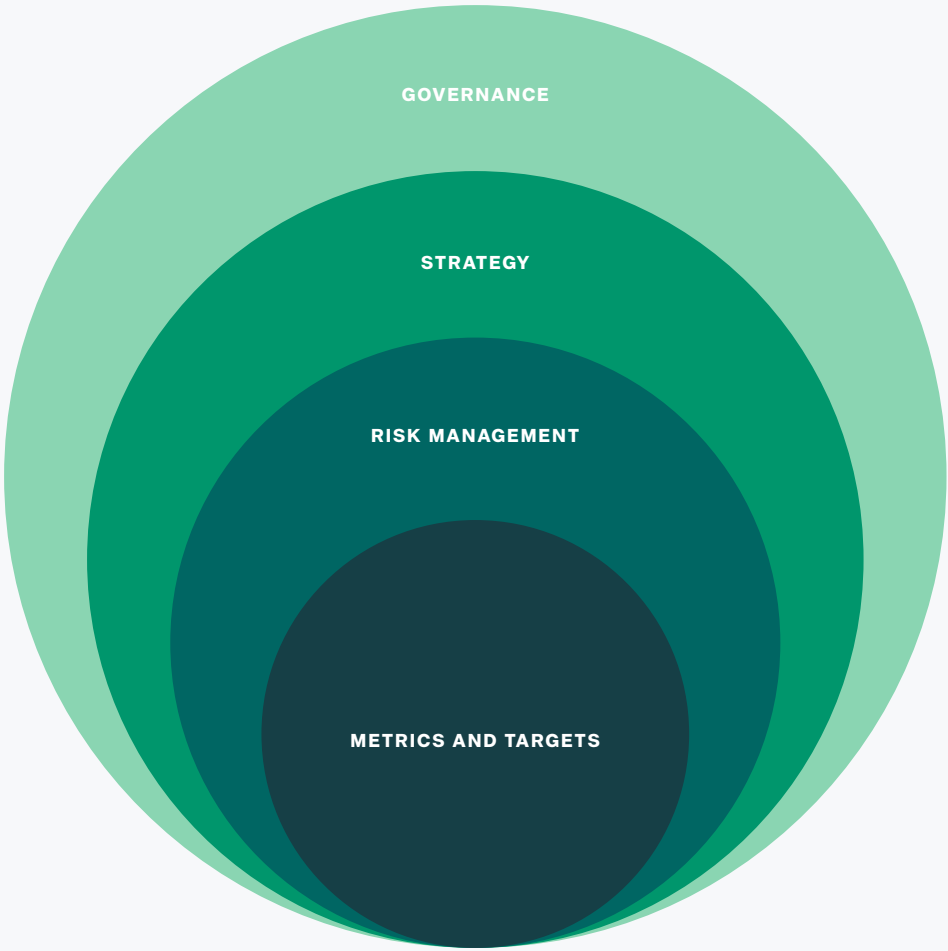
This is Northvolt’s second Task Force on Climate-Related Financial Disclosures (“TCFD”) Report and we have written it based on the TCFD recommendations. We aim to work towards full alignment with TCFD recommendations. All data in this report covers the financial year 2023 unless otherwise noted.

This report describes how climate change may impact our business and how we can successfully transition to a lower-carbon economy and adapt to global warming. This may change as our understanding of the challenges around climate change continues to evolve on an ongoing basis.

TCFD RECOMMENDATIONS The TCFD Recommendations, first launched in 2017, are designed to encourage consistent and comparable reporting on climate-related risks and opportunities by companies to

their stakeholders. The TCFD structures the recommendations around four thematic areas that are core elements of how organizations operate, as shown in the figure to the right. A total of 11 recommendations set out the information that companies should disclose to provide transparency and stability in the face of climate-related risks and opportunities. Throughout this report we have strived to provide information on all four pillars and 11 recommendations.

OTHER SUSTAINABILITY DISCLOSURES While this report is focused on climate-related risks and opportunities, Northvolt has also published its second Sustainability and Annual Report for the year 2023. Here we outline our goals, operations, and strategy on a broader scale as well as the challenges we face in our mission and work to enable the future of energy.



Core elements of recommended climate-related financial disclosures

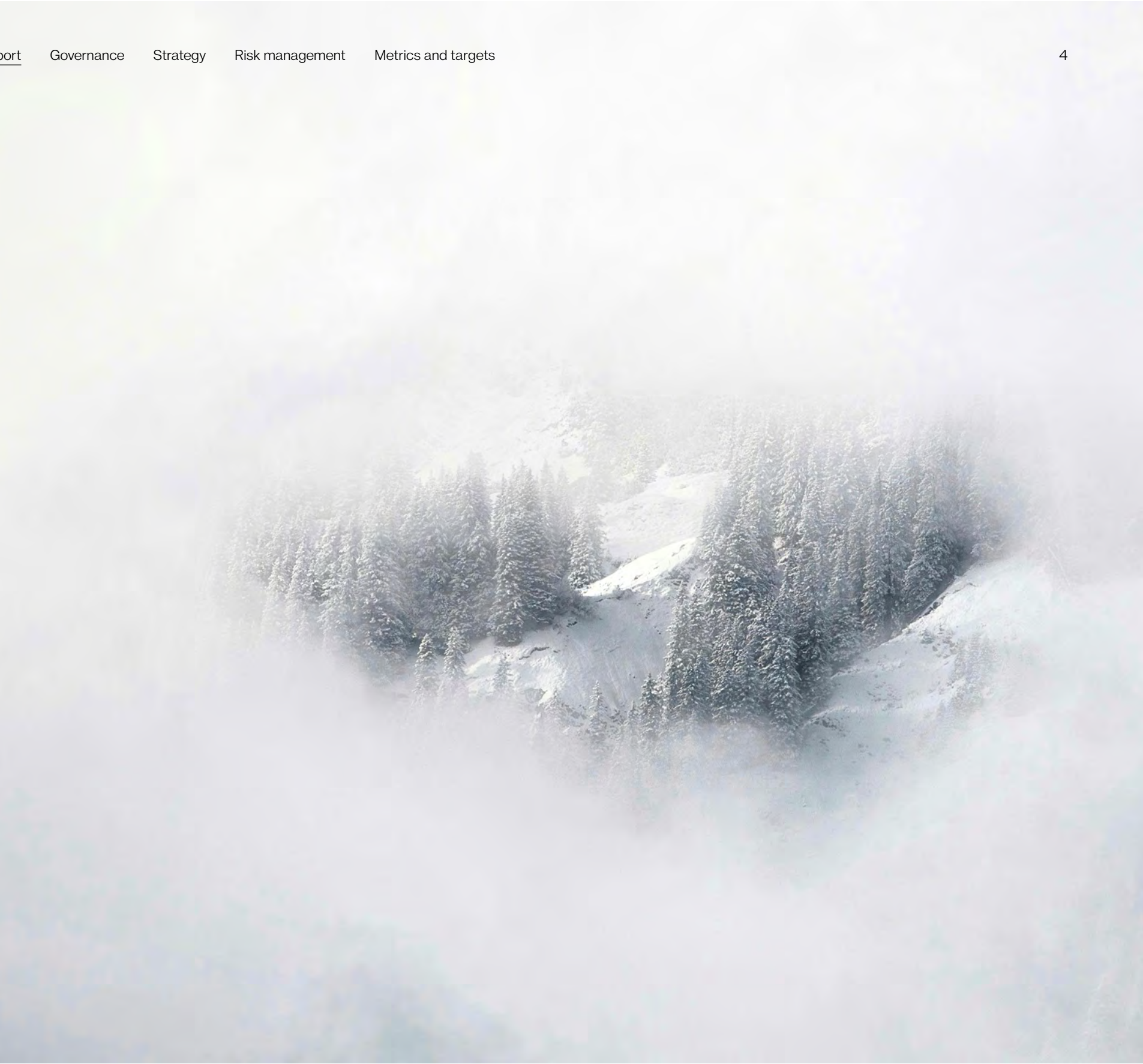
Status tracker

Status of Northvolt’s compliance with the different categories of TCFD recommendations framework.

TCFD recommendations

GOVERNANCE		
A	Describe the board’s oversight of climate-related risks and opportunities	✓
B	Describe management’s role in assessing and managing climate-related risks and opportunities	✓
STRATEGY		
A	Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term	✓
B	Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy and financial planning	✓
C	Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	⚙
RISK MANAGEMENT		
A	Describe the organization’s processes for identifying and assessing climate-related risks	✓
B	Describe the organization’s processes for managing climate-related risks	✓
C	Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization’s overall risk management	✓
METRICS AND TARGETS		
A	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	⚙
B	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	✓
C	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	✓

⚙ Work in progress



Governance

Governance is defined in the TCFD recommendations as “a set of relationships between an organization’s management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organization are set, progress against performance is monitored, and results are evaluated.”

BOARD OVERSIGHT At Northvolt, we are committed to responsible and effective corporate governance to promote the integrity and efficiency of our business and to maximize shareholder value. We have integrated climate-related issues as a key focus within our company strategy from the day Northvolt was launched. This has been extending to the highest levels of governance of the company, including the Northvolt Board of Director`s which has oversight of all our business plans and operations. By design this means that all Board activities are undertaken through a lens of sustainability and climate change.

MANAGEMENT’S ROLE Northvolt’s Management team continuously assesses risks and

opportunities for the company, which includes climate-related risks and opportunities. Examples of focus areas include changes in regulations, availability and access to fossil-free energy, access to green markets and risks and opportunities to our climate performance based on key takeaways from Northvolt’s life cycle assessments (LCAs).

The Executive Management team is also responsible for planning responses to risks and opportunities, delegating responsibilities for these responses across the organization and relevant teams. Our core goals are clearly communicated to all employees and we assess progress and performance on core business objectives on a monthly basis.

Climate-related risks and opportunities specific management

Board of directors

Overseeing sustainability and compliance matters

📋 Sustainability risks and opportunities

📋 Approval of key policies and goals

📋 Approval of key strategies related to sustainability development

RECIEVED INPUT In-depth formal update on sustainability performance once a year

Acts on behalf of ↑ ↓ Is assisted by

Audit, Risk & Sustainability Committee

Overseeing the identification, evaluation and management of risks, including sustainability and compliance risks.

Together with the Board of Directors, review and approve key contracts and review our whistleblowing system.

Executive Management team



Acts on behalf of ↑ ↓ Is assisted by

Sustainability Compliance Committee

Overseeing the effectiveness of our systems and processes for sus-tainable development and management, including due diligence and sustainable supply chain management.

Strategy

Strategy is defined in the TCFD recommendations as: “an organization’s desired future state. An organization’s strategy establishes a foundation against which it can monitor and measure its progress in reaching that desired state. Strategy formulation generally involves establishing the purpose and scope of the organisation’s activities and the nature of its businesses, taking into account the risks and opportunities it faces and the environment in which it operates.”

In 2023 we have mainly worked on the identification of the climate-related risks and opportunities and on our ability to implement appropriate action plan. All our operational sites have undertaken a climate risk assessment in 2023.

Assessing climate-related risks and opportunities is part of our risk management. Effective and strategic management of climate change related risks and opportunities across all aspects of our business is considered vital to our continued ability to operate.

42 potential risks and opportunities were identified as a first round and a major part of them are tagged in the Supply Chain and in our Facilities (more than 70% in total). An action plan has been proposed to implement a response plan together with the relevant internal stakeholders. As the next step we will go through various actions such as, requesting suppliers to undertake a climate-related risks and opportunities assessment and improving our physical risks assessment procedure for new sites.

Our 2023 approach on climate-related risks and opportunities (CRROs) assessment

Physical risks specific

1. IDENTIFICATION	
Classification and description of CRROs	
Value chain step where the CRROs happen	
2. ASSESSMENT & PRIORITIZATION	
Time-horizon	Climate scenarios analysis (RCP 4.5 and RCP 8.5, time horizon 2030 and 2050) to support impact scoring
Impact scoring	
Responsibility	
Potential Financial impact	
3. RISK RESPONSE IMPLEMENTATION	
High-level response for prioritized CRRO with high and medium impact score	Provide adaptation solutions for risks with high and medium impact score per asset

Scope of physical risks assessment

Sites covered by the assessment

1	Northvolt Ett	Skellefteå, Sweden	
2	Revolt Ett	Skellefteå, Sweden	⚡
3	Northvolt Fem	Borlänge, Sweden	⚡
4	Northvolt Labs	Västerås, Sweden	
5	Volthouse	Stockholm, Sweden	
6	Northvolt Dwa	Gdańsk, Poland	
7	Northvolt Six	Montréal, Canada	
8	Northvolt Cuberg	San Fransisco Bay Area, USA	

Sites not covered

9	Northvolt Drei	Heide, Germany	⚡
10	Northvolt-Volvo joint venture	Gothenburg, Sweden	⚡
11	Hydrovolt joint venture	Fredrikstad, Norway	⚡
12	Aurora Lithium joint venture	Setúbal, Portugal	⚡

⚡ Site in development or under construction

Understanding the impact of climate change

Through 2023, we strengthened our Climate Scenario Analysis process to identify, understand and mitigate risks resulting from climate change in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and EU taxonomy. This year, we have conducted climate risk assessments for all our sites.

We utilized two scenarios, Net Zero Emissions by 2050 (NZE) and RCP 8.5 scenario to investigate a variety of potential risks and opportunities related to climate change. While both scenarios are accepted widely and are recommended by the TCFD for Climate Scenario Analysis, we acknowledge that any scenario is based on a set of restrictive assumptions. Due to the variety of risks and their potential financial impact, we approach Climate Scenario Analysis as an ongoing activity.

The results of our initial Climate Scenario Analysis are summarized in the table to the right. We aim to strengthen the internal process of Climate Scenario Analysis, and utilize the outcomes to a greater extent to inform our strategic decision-making. The results presented in the table to the right will be used to increase awareness of climate-related risks and opportunities for our company and inform key decision-makers.

	Scenario	Climate risk	Climate opportunity	Potential financial impact	Example of mitigation actions
LOW EMISSIONS SCENARIO	<p>Net Zero Emissions by 2050 (NZE)</p> <p>The NZE represents a scenario with a fast transition to a net zero emissions economy with the achievement of universal energy access by 2030. Developed by the International Energy Agency, the goal of the Paris Agreement to limit global warming to 1.5°C is achieved in this scenario.</p> <p>KEY SCENARIO CHARACTERISTICS</p> <ul style="list-style-type: none">Energy projection: share of renewable energy rising from 28% in 2021 to 88% in 2050Increased demand for minerals for electric vehicles and battery storage, up from 0.4 Mt in 2020 to 21.5 Mt in 2040Annual battery demand for electric vehicles growing from 0.16 TWh in 2020 to 14 TWh in 2050	<ul style="list-style-type: none">Increased competition and increased demand for securing access to renewable energy supply as major industry players shift their energy supplyScarcity of raw materials due to accelerated transition to electric vehicles with demand for key minerals in batteries exceeding supplyFuel taxation impacting logistics in upstream supply chains with limited ability for Northvolt to change their dependency on fossil-fuelsProtectionalism causing disruptions in the access to raw materials	<ul style="list-style-type: none">Increased production of fossil-free energy could increase the availability of low-carbon raw materials, and new opportunities for expansion of factories on a low-carbon gridVertical integration of raw material supply chains enables a higher degree of traceability which strengthens Northvolt's competitiveness. Vertical integration in production enables flexibility and control of Northvolt's product developmentIncreased demand for battery cells with low carbon footprint as a result of regulatory requirementsEuropean localization of suppliers, shorter supply chains, less exposure to ESG risks and lower CO₂ footprintNew products and market segments due to increased demand for electric vehicles brings Northvolt into a favourable competitive position	<ul style="list-style-type: none">Increased cost of raw materialsReduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbonBusiness interruptionIncreased revenue from higher demand for batteriesIncreased capital availabilityBetter competitive positionIncreased R&D expendituresReputational benefits	<ul style="list-style-type: none">Long-term energy supply agreementsPower purchase agreementsExpanded and localized supplier baseDevelop capacity to process materialTesting of new battery chemistriesIn-house recyclingClose collaboration with suppliers to limit ESG risksFocus on production ramp-up
HIGH EMISSIONS SCENARIO	<p>RCP 8.5</p> <p>The RCP 8.5 is a high-emission scenario developed by the Intergovernmental Panel on Climate Change (IPCC) that represents a pathway with limited climate policy, an energy-intensive industry and dependence on fossil-fuels.</p> <p>KEY SCENARIO CHARACTERISTICS</p> <ul style="list-style-type: none">Increase of extreme heatwaves beyond current levels with higher frequency, intensity and durationIncrease in level and frequency of extreme precipitationIncrease in global average temperaturesIncreased number of extreme weather events such as wildfires and flooding	<ul style="list-style-type: none">Water damage to equipment and infrastructure at battery manufacturing sites as well as suppliers in the upstream value chain, in particular raw materialsOutages in supply of power and water at battery manufacturing sites causing production process disruptionsGeopolitical tension causing disruptions in supply chains.Damage of exposed harbours and mines as a result of rising sea levels, with potential disruption to the availability of key supplies such as raw materials for cathode productionHeatwaves impacting health of employees, equipment efficiency and causing disruption to production processesRegulatory landscape that does not promote green industryLack of incentives for suppliers to transition from fossil fuels to fossil-free energy sources	<ul style="list-style-type: none">Increased demand for battery storage, industrial battery solutions and cellsIntegrated climate adapted solutions at site	<ul style="list-style-type: none">Reduced revenue from disturbance in productionReduced revenue and higher costs from negative impacts on workforceWrite-offs and early retirement of existing assetsIncreased operating and capital costsIncreased insurance premiums and potential for reduced availability of insurance on assets	<ul style="list-style-type: none">Localization of supply chainDecarbonization strategy with our suppliersImprove facility ventilation and temperature systemsPolitical lobbying for more extensive climate legislation

Risk Management

TCFD recommended that organizations disclose their processes for identifying, measuring and managing climate-related risks, as well as describing how these processes are integrated into the organisation’s overall risk management.

We apply a holistic risk management perspective, conducting both top-down and bottom-up risk management inspired by the COSO Enterprise Risk Management (ERM) framework and ISO 31000 Risk Management standard. In a structured manner, we work to identify, analyze, assess and then manage relevant and significant risks that business operation encounter. The annual risk management cycle is integrated and connected to the company’s objectives and budget process.

The ERM Framework is supported by various processes:

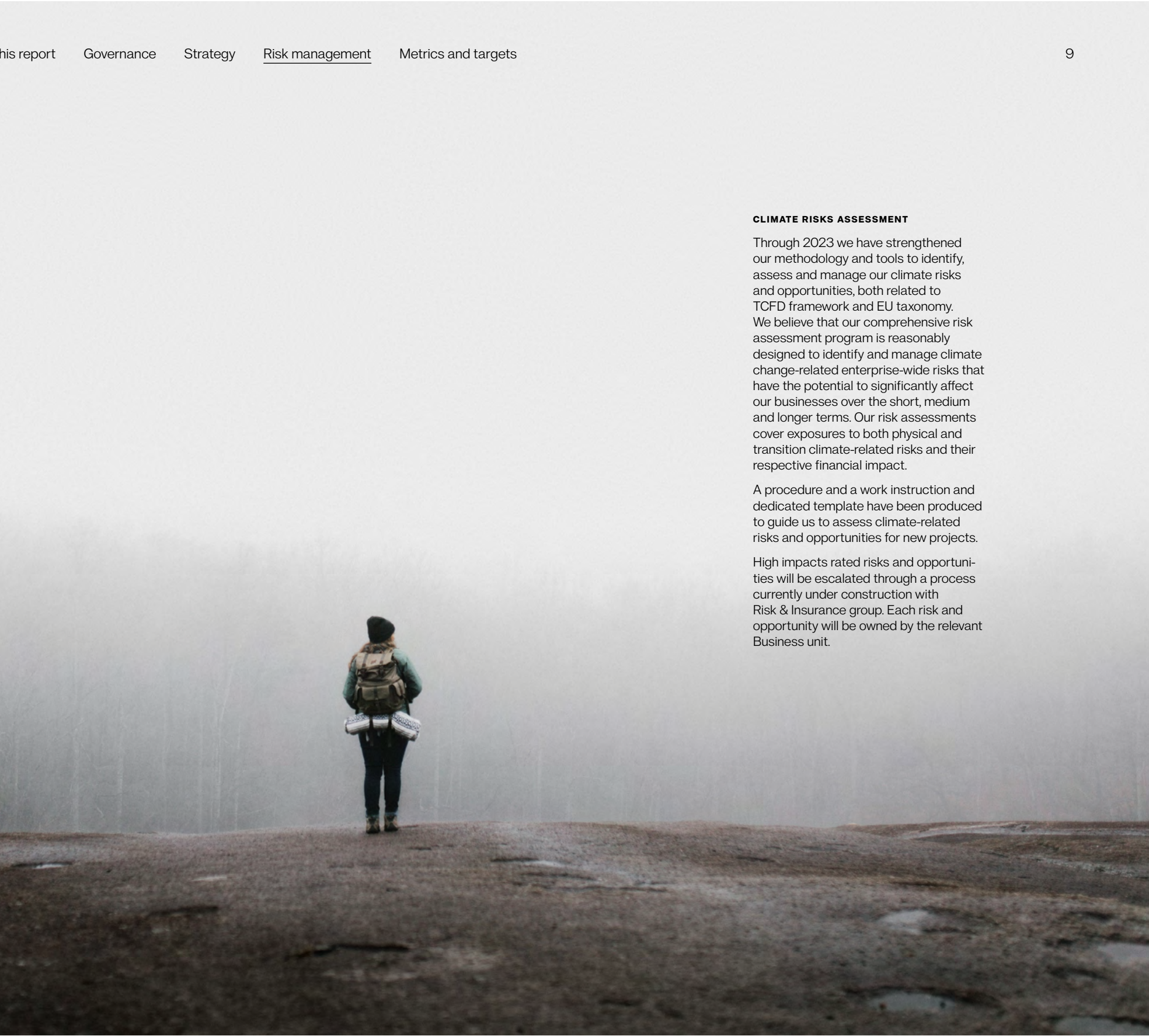
- A top-down assessment is performed yearly and consists of individual risk interviews with member of the Management team to identify risks with impact to their area of responsibility as well as a joint workshop where the Management team analyze and assess risks.
- The bottom-up risk management is performed on an ongoing basis by each Business Unit and Function to identify, assess, analyze, mitigate, and manage risks connected to the effect of uncertainty of objectives by using a risk register. Business Units and Functions retain ownership of their risks and escalate and report on both scheduled and event driven basis.

CLIMATE RISKS ASSESSMENT

Through 2023 we have strengthened our methodology and tools to identify, assess and manage our climate risks and opportunities, both related to TCFD framework and EU taxonomy. We believe that our comprehensive risk assessment program is reasonably designed to identify and manage climate change-related enterprise-wide risks that have the potential to significantly affect our businesses over the short, medium and longer terms. Our risk assessments cover exposures to both physical and transition climate-related risks and their respective financial impact.

A procedure and a work instruction and dedicated template have been produced to guide us to assess climate-related risks and opportunities for new projects.

High impacts rated risks and opportunities will be escalated through a process currently under construction with Risk & Insurance group. Each risk and opportunity will be owned by the relevant Business unit.



Risk management process



[Read more about our Risk Management in our Sustainability and Annual Report 2023, page 40–44](#)

Metrics and targets

A clear understanding of our climate impact is critical to achieving our mission. Only through accurate accounting of where our impact exists can we formulate responses geared towards reduction.

About 98% of our climate impact through 2023 results from activities external to our production sites, as reflected in our Scope 3 (indirect) emissions seen to the right. Materials used in battery manufacturing and our supply chain are the largest contributors to this category of emissions.

In 2022, we introduced Carbon Roadmap 2030 – a data-driven approach to secure a reduction of our cell production carbon footprint from 33 kg today* to 10 kg CO2e/kWh by 2030 through coordinated actions across our value chain. Our goal represents an approximate reduction in carbon footprint of 90% compared to an industry reference cell**.

Our work with life cycle assessment (LCA), which we performed on our cell portfolio and of our energy storage system (ESS) help us account for our environmental impact of our cells. We have certified LCAs of six Northvolt battery cell models to quantify their cradle-to-gate environmental impacts. This year, we expanded

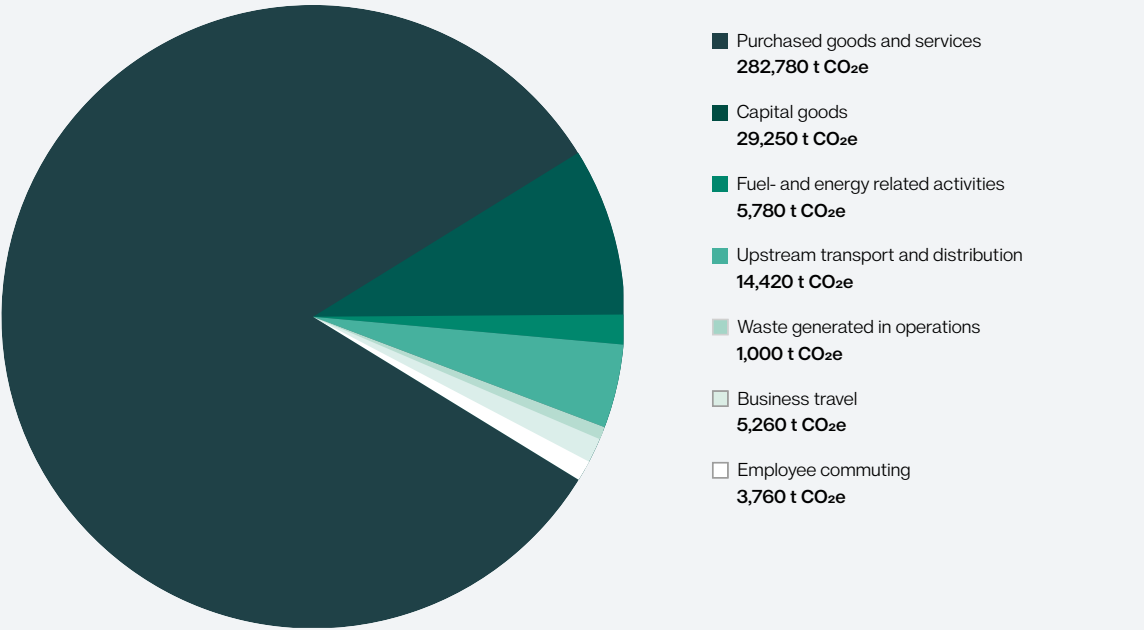
our work by performing cradle-to-cradle LCAs on the same cells, thereby extending the scope of assessment to include the full life cycle: from extraction of resources (cradle), through to end of production (gate) to the disposal or recycling of the product (grave).

We report on scope 1, 2 and 3 carbon emissions and as we begin to establish a baseline, we will develop more comprehensive carbon reduction targets, on an absolute basis.

The journey we are drawing here will also let us understand how our activities will behave according to different scenarios and then assess the realistic risks, opportunities and impacts we might face, mitigate and manage in the future. The development of metrics and targets, additionally to those presented here for 2023, will be the key work of 2024. KPIs will be set up to follow our performance in terms of climate-related risks and opportunities management according to TCFD Guidance.

Understanding climate impact

Scope 1 (DIRECT)	FUELS: 610 t CO ₂ e FUGITIVE EMISSIONS: 124 t CO ₂ e	
Scope 2 (INDIRECT)	MARKET BASED DISTRICT HEATING: 980 t CO ₂ e ELECTRICITY: 0 t CO ₂ e	LOCATION BASED DISTRICT HEATING: 980 t CO ₂ e ELECTRICITY: 8,080 t CO ₂ e
Scope 3 (INDIRECT)		



Understanding our climate impact enables us to take meaningful actions, aligned with our commitment to sustainability and goal of 10 kg CO₂e/kWh at cell level by 2030.

Calculated in accordance with the Greenhouse Gas Protocol, and reported in accordance with the GRI Standards

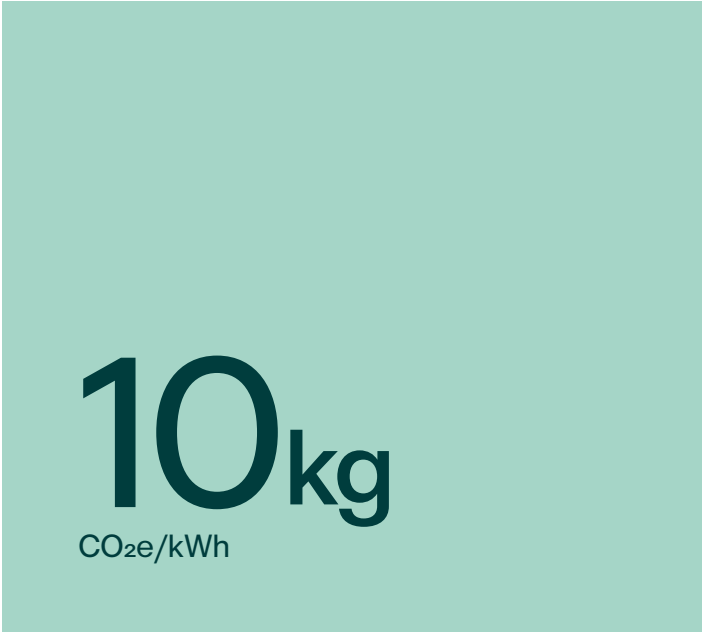
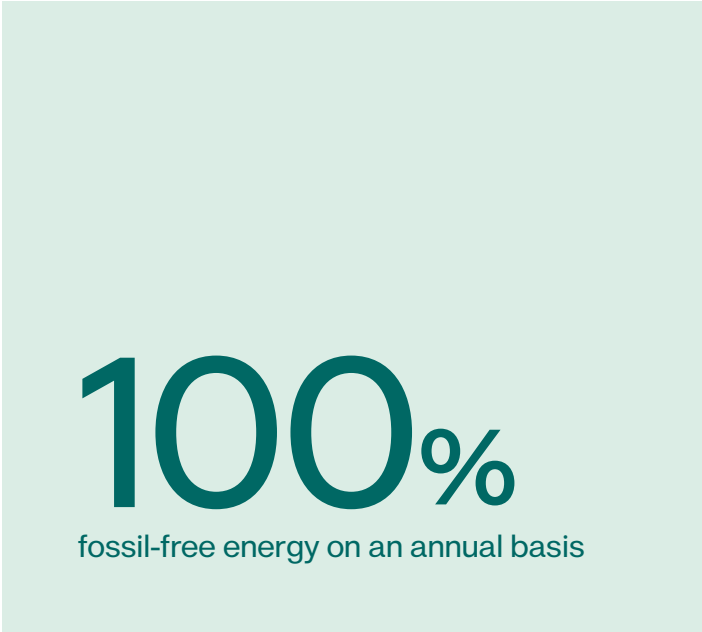
*A projected carbon footprint at serial production using internally produced CAM. **Industry reference based on IVL 2019 lithium-ion NMC 111 cell,

⚡ Energy

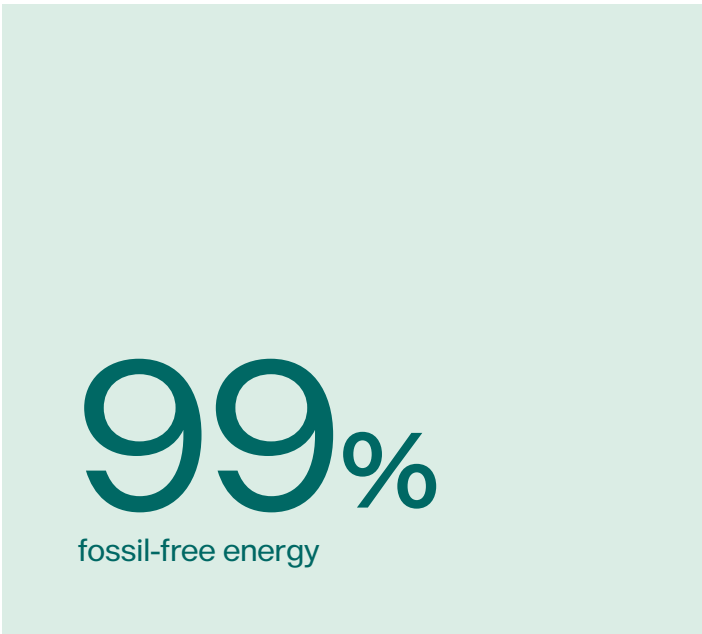
☁ Emissions

♻ Recycling

2030 goal



2023 progress



📖 [Read more about our climate efforts in our Sustainability and Annual Report 2023, page 19–22](#)

*Projected carbon footprint at serial production using internally produced CAM. **The percentage of recycled material includes recycled copper.