

TCFD Report 2023



Our mission

Advanced silicon-based materials shaping a better and more sustainable future, adding value to stakeholders globally

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1.0 The Elkem way: Green leadership

Elkem aims to be part of the solution to combat climate change – and to be one of the winners in the green transition.

Elkem expects that sustainability will drive an increase in products that have a lower carbon footprint. Elkem provides products that are essential for greener solutions like electric vehicles, renewable energy, and more energy efficient buildings. To be able to reach our strategic goal of supplying the green transition, we need to develop an understanding of how risks linked to climate change may affect Elkem. That is why Elkem decided to implement the TCFD framework back in 2020.

As a global industry company, we know that it is important to measure what matters. We are proud to say that we again achieved an A- in the 2022 CDP Climate disclosure. By reporting in accordance with the TCFD recommendations, Elkem wants to participate in building both internal and external understanding and capabilities that support the climate accounting standardisation, promote transparency, and contribute to climate action.

The implementation of the TCFD framework is part of the process to critically evaluate our ESG strategy and ESG KPIs. In 2022, our main efforts have been to better understand the possible acute and chronic physical risks of climate change across a high- and low-emission scenario, while simultaneously following up on the Elkem's climate roadmap launched in 2021.

In the climate roadmap, Elkem endorses the aim of the Paris agreement of limiting global warming to well-below two degrees, highlighted through three pillars:

1. Reducing our emissions

Achieving fully climate neutral production throughout our value chain

2. Supplying to the transition

Providing the advanced material solutions required to enable the green transition

3. Enabling circular economies

Enabling more circular activities in our operations, products and markets

We acknowledge that our climate work is a continuous process. That is why Elkem strives to mature our practices. Going forward, we will follow the climate risk management procedure determining financial impacts of risks and opportunities, alongside investing our time into the climate roadmap and targets towards 2030.

Elkem has a strong starting position, and we will use our competence in innovation, technology development and continuous improvement to enhance our operations, invest in climate solutions and work together with our stakeholders to limit global warming.

It gives me great pleasure to introduce Elkem's 2023 updated climate risk report aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). I hope you find the information in this report both relevant and motivating.



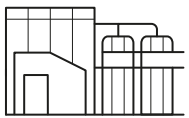
Helge Aasen
CEO

2.0 About Elkem

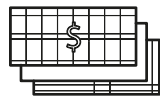
Elkem is one of the world's leading suppliers of silicon-based advanced material solutions shaping a better and more sustainable future. The company develops silicones, silicon products and carbon solutions by combining natural raw materials, renewable energy, and human ingenuity. Elkem helps its customers create and improve essential innovations like electric mobility, digital communications, health, and personal care as well as smarter and more sustainable cities.

At the core of Elkem lies people and safe, sustainable operations conducted responsibly and with excellence. Elkem shall be an attractive employer and at the forefront of environmentally friendly operations within our industry.

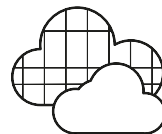
In 2022, Elkem obtained a platinum score from EcoVadis, which rated the company among the world's top 1% on sustainability transparency. Elkem is listed on the Oslo Stock Exchange (ticker: ELK) where it is part of the OBXR ESG Index, a selection of 40 blue-chip companies demonstrating best Environmental, Social and Governance (ESG) practices.



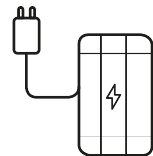
Operations:
30 plants worldwide and
about 7,300 employees



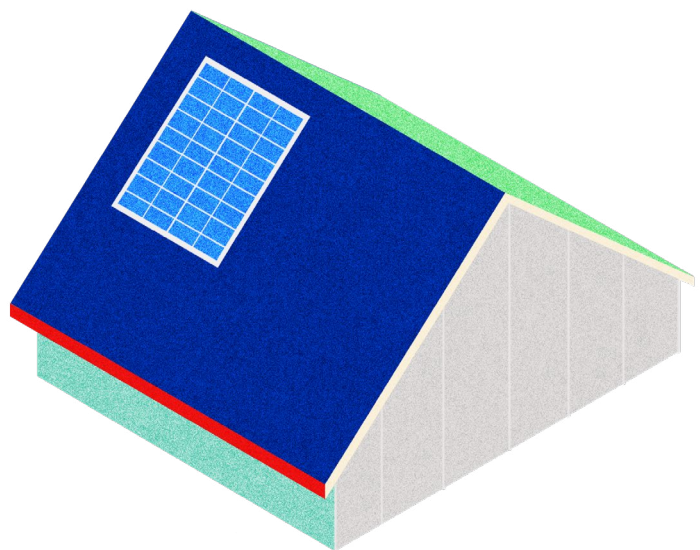
Operating income 2022:
45.9 billion NOK



Total scope 1+2+3
emissions 2022:
10.74 million tonnes



>80% of production
based on renewable
electricity



3.0 The TCFD recommendations and index

3.1 Recommendations

There is a growing demand for climate-related information, and creditors and investors are increasingly demanding access to risk disclosures that are consistent, comparable, and clear. The Task Force on Climate-related Financial Disclosure (TCFD) developed the TCFD disclosure recommendations to promote market transparency and guide financial investments towards future-proof companies. Additionally, TCFD encourages the standardised reporting structure for financially material climate-related risks and opportunities to give investors, lenders, and insurers enhanced comparability when assessing and pricing companies.

The TCFD recommendations are structured around four thematic areas that represent core elements of how organisations operate: governance, strategy, risk management, and metrics and targets. Moreover, the framework separates into three main categories: risks related to the transition to a low-carbon economy, risks related to the physical impacts of climate change, and climate-related opportunities. The TCFD has also incorporated financial impact as an integral part of its disclosure recommendations.



3.2 TCFD content index

The recommended disclosures in the TCFD framework is as follows:

Governance	Strategy	Risk management	Metrics and targets
Disclose the organisation's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's business, strategy, and financial planning where such information is material.	Disclose how the organisation identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
<p>Recommended disclosures</p> <p>a) Describe the board's oversight of climate-related risks and opportunities.</p> <p>b) Describe management's role in assessing and managing climate-related risks and opportunities.</p>	<p>Recommended disclosures</p> <p>a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.</p> <p>b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.</p> <p>c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p>Recommended disclosures</p> <p>a) Describe the organisation's processes for identifying and assessing climate-related risks.</p> <p>b) Describe the organisation's processes for managing climate-related risks.</p> <p>c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.</p>	<p>Recommended disclosures</p> <p>a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.</p> <p>b) Disclose scope 1, scope 2, and, if appropriate, scope 3 greenhouse gas (GHG) emissions, and the related risks.</p> <p>c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.</p>

3.3 CDP and TCFD reporting

Elkem has reported to the Carbon Disclosure Project (CDP) Climate questionnaire since 2020. Reporting to CDP represents an important step for us to better identify and manage the climate-related impact of our business activities globally. In 2022 Elkem reported to all three questionnaires in CDP for the first time, highlighting how connected climate, water and forest is to managing ESG and climate risks.



CDP Climate: A-
 CDP Forests: A-
 CDP Water: B

In 2023 Elkem has updated the TCFD report first published in 2021, mainly focusing on the possible physical climate change risks the company can be exposed to. The TCFD's focus and guidance on climate-related financial impacts and scenario analysis is an important process, both to ensure transparency, but also to improve the company's understanding of how climate-related issues can change over time, and how Elkem will mitigate the expected changes.

4.0 TCFD disclosure summary

Governance

- a) Climate-related issues are integrated into Elkem's overall business strategy and responsibility sits with the collective board. The board follows up and reviews the climate strategy on an annual basis as part of the regular strategy process. In 2022, the Audit committee assumed the board level responsibility for preparatory work and supervision of climate related issues.
- b) The highest management level positions with responsibility for climate-related issues sits in corporate management. The Chief Financial Officer (CFO) and the Senior Vice President of Technology (SVP Technology) are both responsible for assessing and managing climate-related risks and opportunities, and report to the board on climate-related issues on a quarterly basis.

Strategy

- a) The 2021 global climate roadmap has been influenced by the main risks and opportunities. In the short and medium time horizon, the transitional risks have been identified to have the greatest impact on Elkem.
- b) Climate-related risks and opportunities have influenced our strategy and strategic decisions in all business areas, including products and services, value chain, investments in R&D, and operations.
- c) We aim to limit the long-term global temperature increase to well below 2°C – in line with the Paris agreement. We developed a corporate strategy in 2022 that highlights green leadership, which aims to future proof Elkem's business. The corporate strategy and the 2021 climate roadmap are aligned.

Risk management

- a) Elkem's board of directors and management conduct regular reviews of the group's activities for identifying, assessing, and responding to climate-related risks and opportunities.
- b) The process for identifying and managing climate-related risks are integrated into the multidisciplinary risk management process.
- c) The total risk exposure is analysed, evaluated, and summarised at least on an annual basis in a bottom-up process where each of the divisions and key corporate functions goes through a defined process to identify and quantify the main risks.

Metrics and targets

- a) Elkem has different key metrics to measure and manage climate-related risks and opportunities, such as CO₂ emissions and energy consumption KPIs.
- b) Elkem's carbon accounting follows the Greenhouse Gas Protocol. Elkem has matured the GHG emissions calculations for all locations since 2018. Complete carbon accounting for all scopes was achieved for the year 2020 and is now an annual procedure.
- c) We have set absolute reduction targets and will reduce fossil CO₂ emissions. Our GHG emission reduction targets are classified as a well-below 2°C (2030) and 1,5°C (2050), aligned with the Paris Agreement.

5.0 Governance

5.1 Board-level oversight

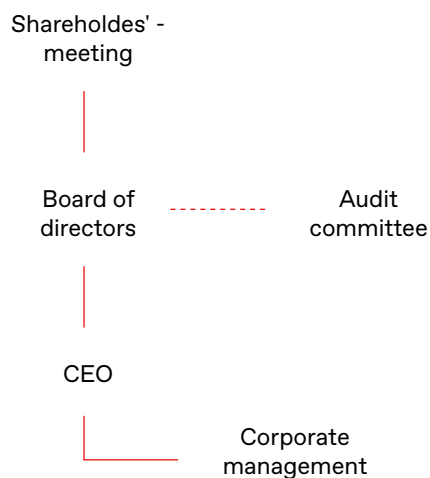


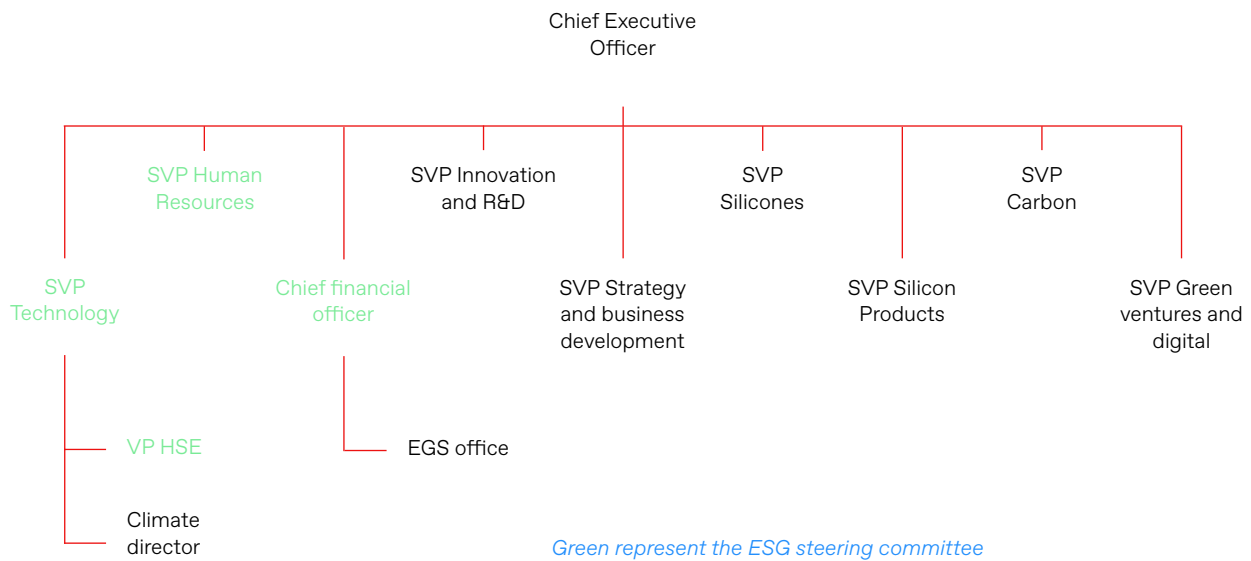
Figure 1 – Board-level oversight

In Elkem the collective board has the responsibility for climate-related issues. The Audit committee assumed the board level responsibility for climate-related issues in 2022. The mandate for the Audit committee includes preparatory work related to the board’s management of sustainability and non-financial reporting, internal control over sustainability and non-financial reporting, and sustainability-related risk management. The Audit committee also supports the board in supervising adherence to external regulations and oversees that Elkem meets its targets to reduce fossil GHG emissions and develops its business to take advantage of relevant climate-related opportunities.

Climate-related issues represent important risk factors to the business, as well as representing attractive opportunities as our products can enable lower GHG emissions in third parties. Climate issues are therefore an integrated part of Elkem’s business strategy and the collective board is responsible for enhancing the strategy to mitigate risks and meet opportunities.



5.2 Executive management team oversight



Corporate management is the highest management level with responsibility for climate-related issues. The CEO is the formal owner of Elkem's policy, procedure and execution for Environmental, Social and Governance (ESG) and climate-related topics.

In corporate management there are two positions with the daily operational responsibility for climate-related issues: the Chief Financial Officer (CFO) and the Senior Vice President of Technology (SVP Technology). They are responsible for both assessing and managing climate-related risks and opportunities, and report to the board on climate-related issues on a quarterly basis.

The CFO is responsible for managing Elkem's ESG steering committee, which is the corporate body with responsibility for climate-related issues. The ESG steering committee consists of members of the corporate management. The members are presented in the model above, and include the CFO, the SVP Technology, the SVP Human Resources, and the VP HSE. The ESG steering committee evaluates climate change, mitigating risks, and seizing opportunities that involve environmental, social, and economic factors. The ESG steering committee, led by the CFO, regularly reports findings and progress to the CEO to ensure holistic governance at the management level. The CFO plays a key role in strategic processes, including investment decisions that impact the climate strategy. Elkem wants to ensure that the climate strategy has strong anchoring in the top management and the CFO involves both internal and external stakeholder groups such as the board, investors, and banks.

Elkem's SVP Technology shares the responsibility for climate-related issues with the CFO. The key reason why responsibility for climate-related issues has also been assigned to the SVP Technology is that the position is responsible for evaluating, developing, and executing technology solutions that enable lower GHG emissions. In addition, the following two key functions report to SVP Technology; VP HSE who is responsible for monitoring of CO₂ emissions, and Climate director who is responsible for coordination of Elkem's work related to the climate strategy.

6.0 Strategy

6.1 Climate-related risks and opportunities

Elkem considers both the short-, medium- and long-term financial and strategic time horizons when assessing climate-related risks and opportunities (R&O's). The following definition of time horizons is applied for transition risks and opportunities:

- Short-term: 0 – 5 years
- Medium-term: 5 – 12 years
- Long-term: 12 + years

For physical climate risks and opportunities, a longer time horizon is used when identifying potential impacts across Elkem's locations. Due to the available projections from best available climate science, physical climate risks and opportunities use the following time horizons:

- Short-term: towards 2040
- Long-term: 2040-2100

Elkem has proactively identified the risks and the opportunities related to climate change that have the greatest impact on our business.

Understanding the potential impacts of climate change requires an understanding of climate scenarios. In a low-emission scenario, Elkem is posed with more immediate transition risks & opportunities in the short- and medium-term, while physical impacts of climate change are largely moderate as the world manages to limit warming to well-below 2°C. On the other hand, a high-emission scenario will result in more severe physical climate change impacts across our global operations as warming results in more erratic acute impacts alongside severe chronic changes. A high-emission scenario will see less immediate transition risks & opportunities as the world's transition is delayed and uncoordinated.

On the whole, climate-related issues represent important risk factors to the business, as well as attractive business opportunities since our products can be key enablers for lower GHG emissions through renewable energy, energy storage, electrification of transportation, etc. Climate issues are therefore an integrated part of Elkem's business strategy. Elkem has a clear corporate strategy to strengthen our competitive positions through dual play growth and green leadership. Elkem aims to limit the long-term global temperature increase to well-below 2°C, in line with the Paris agreement.

To achieve this target, Elkem will apply the climate roadmap that details this commitment. The mission is to provide advanced material solutions shaping a better and more sustainable future. To deliver on the roadmap, Elkem will focus on three key levers: Reducing the fossil CO₂ emissions, supplying to the green transition, and enabling more circular economies.

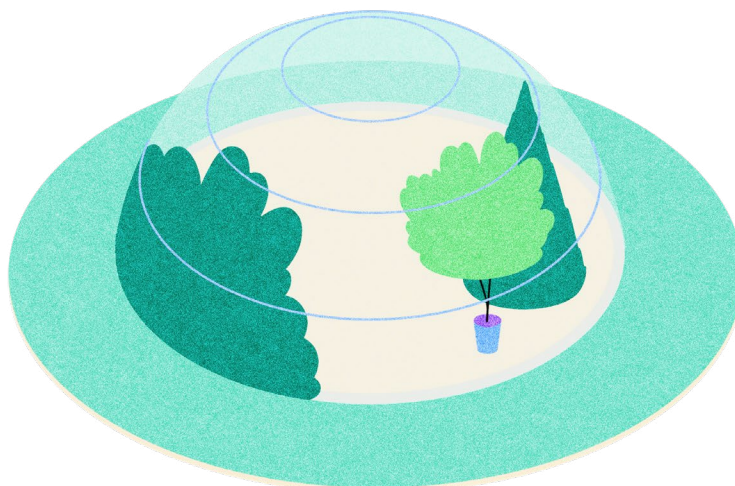
Reducing our emissions	Supplying to the transition	Enabling circular economics
<p>Achieve fully climate neutral production throughout our value chain</p> <p>By 2031: Reducing absolute emissions by 28% from 2020-2031 while growing the business - delivering 39% improvement in product footprint</p> <p>By 2050: Achieving fully carbon neutral production (zero fossil emissions) globally</p>	<p>Providing the advanced material solutions required to enable the green transition</p> <p>Grow supplies of advanced materials to green markets such as better buildings, electric vehicles and renewable energy</p> <p>Build new business in green markets such as battery materials, biomass and energy recovery</p>	<p>Enabling more circular activities in our operations, products and markets</p> <p>Increase recycling in our own operations</p> <p>Increase recycling with our customers</p> <p>Develop the eco-design of innovative products</p>

6.1.1 Transitional climate-related risks

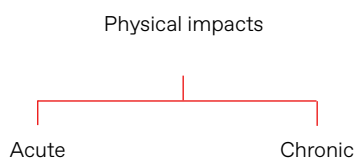
Risk category	Risk type	Likelihood	Potential financial report	Time horizon	Description of risk	Mitigation Strategy
Transitional	Regulatory risk	Virtually certain	Medium	Short term	<p>Elkem has upstream silicon and ferrosilicon production in Norway and Iceland, and silicones production in France. These are under the ambit of the EU's emission trading system (ETS). A reduction of allocation of free allowances and/or a higher price will increase Elkem's direct costs.</p> <p>In addition, Elkem has upstream silicon and silicones production in China. The development of a quota system in China is at an early stage, but has the potential to increase the cost of operations in the country.</p> <p>There are mainly three risks for Elkem regarding the substitution of existing products and services with lower emissions options.</p>	<p>The strategy is to increase the use of biocarbon in the smelters to reduce overall fossil CO₂ emissions. The target is to increase the share to 50 % in 2030. To achieve this target, Elkem will commit to new external suppliers and sources of biocarbon and build its own capacity for production biogenic reduction material. All of Elkem's smelters have developed CO₂ roadmaps to increase their bio-share.</p>
	Technological risk	Likely	High	Medium term	<p>Firstly, the EU Taxonomy will reorient capital flows towards "green" sustainable projects. Elkem may be impacted through the need for technological upgrades to meet requirements in the taxonomy.</p> <p>Secondly, the global focus on reducing fossil GHG emissions may negatively impact the attractiveness of Elkem's products and cause development of substitute products.</p> <p>Thirdly, coal and char are used as reduction agents in the production process and may in the future become scarce resources. This creates a risk connected to access to critical raw materials.</p>	<p>To mitigate these risks, Elkem pursues several alternatives. Elkem will reinforce its efforts to reduce energy consumption, reduce GHG emissions, and develop products that enable reduced GHG emissions. In addition, as the EU Taxonomy evaluates activities where Elkem's products end up, Elkem follows the development in the EU to be able to adapt the portfolio to supply the green transition.</p> <p>Elkem's strategy to mitigate further access to fossil-based raw materials is to increase the share of biocarbon. Increased share of biocarbon is an overall part of Elkem's business strategy. The strategy is to replace coal and char, and secure access to biocarbon through supply contracts. In addition, Elkem is also investigating solutions for CCS/CCU to become carbon neutral by 2050, and has started testing the world's first carbon capture pilot for silicon smelters at the plant in Rana, Norway.</p>

6.1.2 Transitional climate-related risks

Opportunity category	Opportunity type	Likelihood	Potential financial report	Time horizon	Strategy to realise opportunity	Description of opportunity
Transitional Market	Products and services	Very likely	High	Short term	Elkem offers products that support the green transition. Two examples are silicones and anode material. Elkem's production of speciality silicones which are used for insulation of battery packs and cabling in EVs. The sales of electric vehicles (EVs) are expected to grow significantly over the coming years, and EVs require 4x more silicones solutions compared to internal combustion engine vehicles. The market for batteries is also expected to grow considerably over the coming years. The global demand for Li-ion battery cells is expected to grow significantly by 2030. A key component in batteries is the anode which mainly consists of graphite. In the future, markets also expect that silicon could become an important anode material.	<p>Elkem is well-positioned to realise these opportunities through existing products and R&D capabilities. Extensive development and testing processes to comply with manufacturers' quality and production requirements are conducted. Elkem is already a qualified supplier of battery insulation for EV manufacturers and a supplier of silicones rubber for EV cables.</p> <p>Elkem has developed a new technology for production of synthetic graphite to batteries based on 100+ years of experience in large-scale manufacturing of carbon materials in high temperature processes. These activities are now performed by Vianode, a company where Elkem owns 40%.</p>
	Products and services	Very likely	High	Medium term	Circular economy practices such as recycled materials could enable Elkem to reduce GHG emissions. For example, by recycling silicones, the emissions may be reduced by 65 %. Elkem aims to increase recycling in its operations and facilitate the recycling of end-products. These innovations could enable Elkem to offer lower emissions goods that increase the market attractiveness.	Elkem is working with customers and researchers across: Reduce, reuse, recycle and renewable. For example, using recycled raw materials in our operations, by collecting raw materials, reintroducing them and also by valuing by-products (i.e. Microsilica). By joining forces with customers, we aim to increase the collection of end-of-life products to recycle them chemically or mechanically.



6.1.3 Physical climate-related risks



- Long time horizons (2030 and beyond)
- Higher risk in a high-emission scenario
- Can be modelled with robust historical data
- Insights gathered from scenario analysis utilising climate models

Since the first TCFD report was published in 2021, Elkem has worked to increase the understanding of physical climate-related risks for the company. In the initial mapping and assessment of 19 key strategic locations for Elkem where chosen, in Norway, The Netherlands, France, Iceland, China, Canada, USA, and Brazil.

In the process, common data metrics and parameters were identified, based on data availability and quality. The type of physical impacts that have been prioritised for further analysis were:

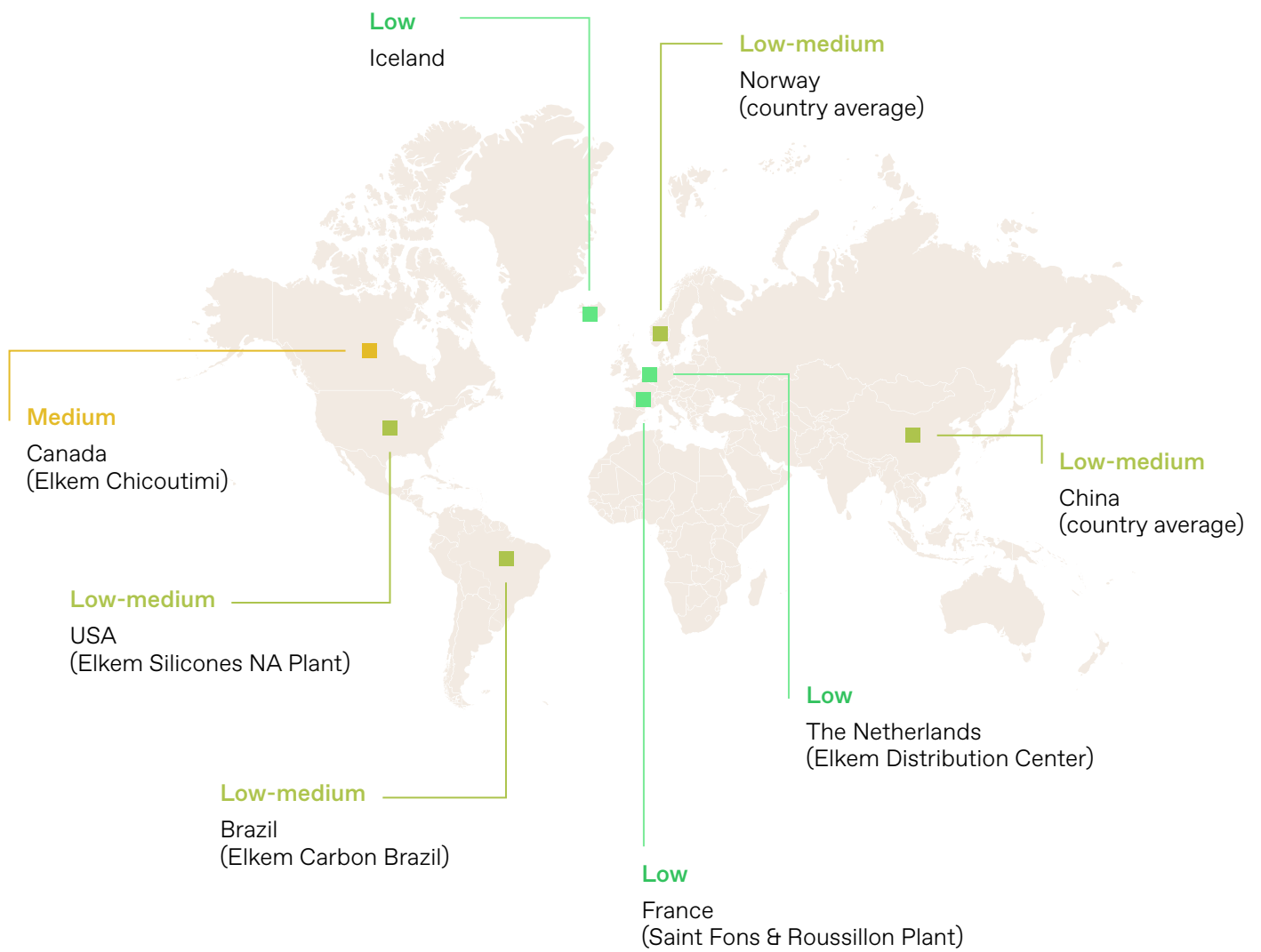
Acute risks: Storm surge, heatwave, and extreme weather, and flood.

Chronic risks: Rising sea level and drought.

Overall, the risk of extreme weather variability in the form of acute precipitation is the most common significant risk for Elkem's locations, particularly related to China, Canada and Brazil. Heatwaves may also impose a risk for several locations like USA, China and Brazil. In addition, countries like the Netherlands, France, Brazil and China are projected to experience an increase in droughts. Iceland and the Netherlands are also at risk of flooding from sea level rise or storm surges. Two of the Chinese locations and one of the French plants are located close to rivers and are therefore at risk of river flooding.

The two map overviews on the next page show the scenario findings in a 2 degrees global warming scenario (low) and a 4 degrees global warming scenario (high). The scenarios are descriptions of hypothetical, plausible futures and not Elkem's own forecasts.

Global overview of risks analysed: low emission scenario



Low risk

Medium risk

High risk

6.2 Climate-related R&O's influencing our strategy

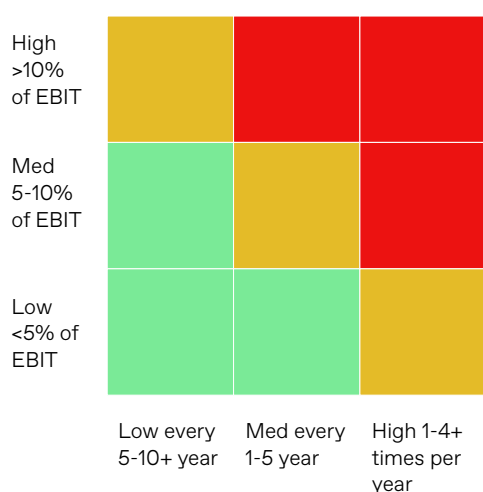
Different risks and opportunities were included in the process to establish the corporate strategy of dual growth and green leadership.

Business areas influenced by climate-related R&O's	Description	Strategy decision made
Products and services	The demand for Elkem's products is driven by global megatrends such as sustainability and energy demand growth, e.g. solutions for the electrification of transportation, renewable energy, and increased energy storage. Carbon footprint is deemed to constitute a potential risk, which has influenced our strategy, as the market demand for greener products with the lowest carbon footprint is increasing in a short- to medium-term perspective.	<p>→ One of Elkem's strategic goals is green leadership. The company focuses on growth potential in product areas that could contribute to a more sustainable future, e.g. silicon to solar panels and batteries, specialty foundry alloys to wind turbines, silicone applications for EVs and anode material for li-ion batteries. Supplying the green transition is one of three pillars in Elkem's climate roadmap.</p> <p>→ Develop more sustainable production processes for our products through energy recovery, reduction of waste, and lowering of the group's carbon footprint. Investments in energy recovery plants and the biocarbon pilot plant are examples of substantive strategic decisions which are influenced by climate-related financial risks.</p>
Value chain	The increased focus of GHG emissions and possibly reduced access to coal-based raw materials in our value chain is a key risk. Our strategy has been to focus on the development of alternative carbon material strategies.	The short-term strategy is to increase the use of biocarbon based on sourcing from external suppliers. The short- to medium-term strategy includes technological development and construction of industrial production of biocarbon materials with the required properties and cost to ensure sustainable production. The investment in the biocarbon pilot plant in Canada was a substantive strategic decision in 2020, which was influenced by our assessment of climate-related risks and opportunities. The biocarbon pilot plant started production end of 2022.
Investments in R&D	Our strategy for investments in R&D has been influenced by climate-related issues for many years, as we have set targets to reduce GHG emissions in the production process and to develop products that contribute to a reduction of GHG emissions.	<p>Elkem has a strong focus on R&D, and climate-related risks and opportunities have impacted the focus areas. The investments in biocarbon material to replace fossil coal is a decision which was influenced by transitional climate-related risks. We are working on new technologies that could significantly reduce GHG emissions from the smelting processes.</p> <p>Elkem has in partnership with external partners launched the first carbon capture and storage (CCS) pilot for smelters in 2022 at Elkem Rana, Norway, with promising results. The target is to build a technology that is applicable for smelters worldwide</p>
Operations	Changes in ETS regulations may cause a reduction of allowances and higher prices. This will increase Elkem's direct costs which is a current risk in our operations. Longer term, the target to reduce the GHG emissions from production is therefore a strategic goal driven by climate-related issues. A system for carbon pricing in China is under development and could potentially impact Elkem's local operations.	<p>The increase of silicon yield in the silicon and ferrosilicon smelters has been a strategic goal for more than ten years and continues to be an important goal influenced by climate-related issues. We will continue to pursue this strategic goal in the short, medium- and long-term horizon. We seek to locate our smelting plants where there is access to renewable energy and source external silicon and ferrosilicon supply for low carbon sources.</p> <p>Another important initiative will be to work closely with customers and researchers to implement the four Rs in the circular economy. Enabling more circularity is part of Elkem's climate roadmap, and affects all aspects of the value chain. For example, eco-design has the potential to reduce material and energy consumed.</p>

7.0 Risk management

Elkem's board of directors and management conduct regular review of the group's strategy, which includes processes for identifying, assessing, and responding to climate-related risks and opportunities. Climate-risk assessments are also integrated into our multi-disciplinary company-wide risk management process. The risk management process is also reviewed on an annual basis, normally in connection with the budget process. The overall risk assessment includes evaluation of climate-related risks and is presented by the CFO at board meetings. Climate-related issues represent important risk factors to the business, as well as it represent attractive opportunities.

The process is used to determine whether any risks in our value chain, including direct operations, upstream and downstream, could potentially have a substantial financial impact on quantifiable factors that will affect Elkem's EBITDA, cash flow and equity. A substantive financial risk will generally have a financial impact of more than >10% of EBIT, with a timeframe of occurrence within 0-5 years and a 60 % likelihood.



The yearly risk mapping process is based on interviews with divisions and corporate staff functions. The objective is to identify the top risks for each division and corporate function. The individual risks are then organised into categories and aggregated on group level. The risks are split into five main categories; strategic risks, financial risks, raw material risks, production and process risks, and market and product risks.

Climate-related risks have become an increasingly important part of this risk management processes, as climate risks could affect Elkem's strategic positioning, raw material supply, end-markets, and financial performance.

In a short-term perspective most climate-related risks are perceived to have limited financial impact or frequency. This could however, increase going forward due to climate change. Such risks particularly include acute and chronic physical risks. Elkem has therefore made a study on physical climate risks based on locations to gain an understanding of where Elkem is materially exposed to ensure that the group has a thorough understanding of these risk and can take appropriate action if and when needed. The results of this study are summarized in chapter 6.2.

When assessing and deciding on the profitability of emission abatement projects, an internal price on carbon is used. Elkem normally uses the prevailing market price of carbon as its internal price of carbon.

Risk type	Relevance in risk assessment	Description
Transitional risks	Current regulations	<p>Relevant, always included</p> <p>Current regulation is always included as an essential part of our risk assessment process due to the urgency of immediate compliance actions and the potential impact on financial results.</p> <p>→ Elkem's operations in Europe are subject to CO₂ allowances managed by the European emission trading system (ETS). Elkem's plant in Canada is subjected to a regional quota system. As the costs related to this are significant, this is deemed to be a highly relevant risk for the company that could have a substantive financial impact.</p>
	Emerging regulations	<p>Relevant, always included</p> <p>Emerging regulation is always included as part of our risk assessment process due to the potentially significant impact on frame conditions and competitive position.</p> <p>→ EU's ambitions to reduce carbon emissions, which include emerging regulations that are likely to impact Elkem. Such emerging regulations could be a system for Carbon Border Adjustment Mechanism (CBAM).</p> <p>→ The EU Taxonomy is a system to categorise green investments and ensure capital allocation to such projects. As such regulations could have a significant impact on Elkem, they are deemed to be highly relevant risk factors. → China's carbon trading scheme to include more sectors in the coming years.</p>
	Technology	<p>Relevant, always included</p> <p>Technology is an important driver for how Elkem could achieve lower emissions and reduce environmental impact from its production processes. The risk within this area is the uncertainty of technological development and deployment which needs to be monitored.</p> <p>→ Elkem aims to be at the forefront of developing new technology for the reduction of GHG emissions and an assessment of technology risk is therefore relevant for strategic planning processes. This technology includes the use of renewable reduction material (biocarbon) in place of fossil reduction material, as well as efforts to make such material in-house through a biocarbon pilot plant.</p> <p>→ Elkem is investigating solutions for CCS/CCU for smelters, to become carbon neutral by 2050. A pilot has been launched at Elkem Rana.</p>
	Legal	<p>Relevant, always included</p> <p>Elkem's operations are subject to environmental permits and adaptation to legislation which is why legal risks are always relevant and included in our climate assessments. The risk of a possible implementation of strict permit levels introduced by governments and/or other policy changes requires our attention to mitigate a rapid transition.</p> <p>→ Elkem must operate within the defined permits in order to secure its "license to operate", and to avoid production curtailments or even plant closures and therefore assess potential legal risks frequently.</p>
	Market	<p>Relevant, always included</p> <p>Elkem acknowledges that climate change creates new markets, new needs, and new preferences which is why market risks are highly relevant in our assessments.</p> <p>→ The demand for Elkem's products may be impacted by consumer preferences for low carbon products which is a risk we include in our risk assessment.</p>
	Reputation	<p>Relevant, always included</p> <p>The potential impact on Elkem's reputation is evaluated as a part of our risk assessment which is incorporated in our decision processes for strategy development.</p> <p>→ There is an increased focus on environmental and climate-friendly production from society, employees, investors, etc. Such considerations are increasingly important for young professionals, and reputation risks are considered highly relevant for Elkem.</p> <p>→ It is of utmost importance for Elkem to be perceived as an attractive employer in order to attract talents to improve production processes and develop new products.</p>
Physical risks	Acute	<p>Relevant, sometimes included</p> <p>Elkem operates globally and has production units close to rivers and oceans. There is a potential risk of extreme weather causing a physical impact on both people and assets.</p> <p>→ Plants could be exposed to acute storm surge, heatwave, extreme weather, and flood.</p> <p>→ Extreme weather conditions could impact raw materials accessibility, transportation and pricing.</p>
	Chronic	<p>Relevant, sometimes included</p> <p>Chronic physical climate risks are not defined as substantive risks for the company at the moment. However, these risks might impact the company in the future. The current mapping reveals that the plants could be exposed to chronic events such as rising sea level and drought.</p>

8.0 Metrics and targets

8.1 Climate accounting

Elkem's ambition is to reduce the company's fossil CO₂ footprint, by increasing the use of renewable carbon sources and developing of innovative production processes. Our target and metrics are an integrated part in the annual ESG report that allows our stakeholders to follow our progression.

8.1.1 CO₂ emissions metrics

Elkem's carbon footprint accounting is in accordance with the GHG protocol, and we calculate all three scopes.

- Scope 1 covers all direct emission sources, including all use of fossil fuels for stationary combustion (predominantly diesel generators) and transportation.
- Scope 2 includes indirect emissions related to our purchased energy (i.e., electricity and heating/cooling). This includes purchased energy for our offices and sites globally.
- Scope 3 comprises indirect emissions resulting from our value chain activities.

	Metric	2022	2021	2020	Comment
Scope 1 - direct emissions	Mill tonnes CO ₂ e	2.42	2.34	2.39	+3%
Scope 2 - Indirect emissions, electricity use, location based	Mill tonnes CO ₂ e	0.94	0.90	0.91	+5%
Scope 2 - Indirect emissions, electricity use, market based	Mill tonnes CO ₂ e	2.83	2.75	2.24	+3%
Scope 3 - indirect emissions, total	Mill tonnes CO ₂ e	7.38	8.35	6.95	-12%
to gate	Mill tonnes CO ₂ e	4.06	4.92	3.72	-18%
after gate	Mill tonnes CO ₂ e	3.33	3.43	3.23	-3%
Biocarbon share	%	20%	22%	19%	-2%
Elkem average product group carbon footprint (PGCF)	Kg CO ₂ e / kg produced	6.9	7.4	N/A	-7%
Total GHG emissions	Mill tonnes CO ₂ e	10.74	1.60	10.27	-7%

The colour indicates a positive or negative development year on year.

8.1.2 Energy metrics

Energy consumption 2022	GWh from renewable sources	GWh from non-renewable sources	Total (renewable and non-renewable) GWh
Consumption of fuel	0	1 438	1 438
Consumption of purchased or acquired electricity	5 397	1 144	6 542
Consumption of purchased or acquired heat	0	0	0
Consumption of purchased or acquired steam	0	53	53
Total energy consumption	5 397	2 635	8 032

Electricity	Metric	2022	2021	2020
Electricity consumption	GWh	6 542	6 536	6 399
Energy recovery	GWh	892	909	711
Energy efficiency	GWh	11%	13%	10%
Share of total gross electricity based on renewable energy production	%	81%	84%	81%

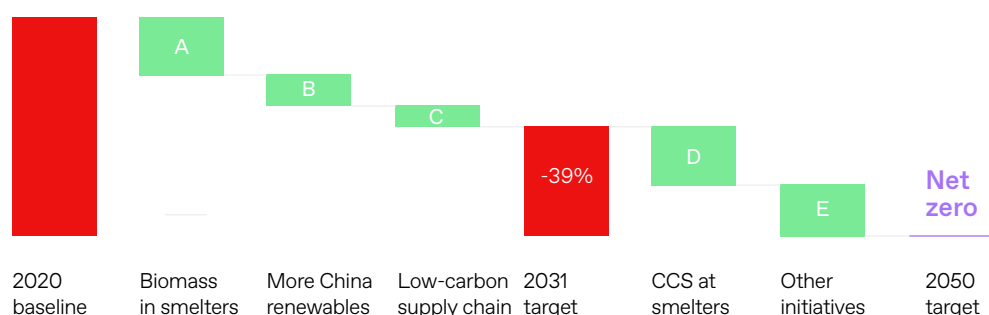
8.1.3 Biocarbon metrics

	Metric	2022	2021	2020
CO ₂ emissions from renewable sources (biogenic)	tCO ₂ e	604 000	550 000	541 000
Percent of renewable carbon sources, Elkem group	%	20%	22%	19%
Percent of renewable carbon sources, Norwegian smelters	%	22%	21%	20%

8.2 Climate roadmap

The climate roadmap explains Elkem's main actions to be implemented to meet emission targets in the climate change strategy:

Our roadmap to climate neutral products (*illustrative*)



A: Changing to biomass as reduction material

Increasing share of bio-based materials from wood waste as reduction material in our smelters. Elkem has a pronounced goal for using 20 % biological materials in the mix of reduction materials in the production of silicon and ferrosilicon alloys in Norway within 2021 and 50 % within 2030. Elkem reached the 20 % goal in 2018, and works to reach the 2030 milestone.

- To reach this goal Elkem will develop a new industrial process for bio-based materials tailor-made for silicon and ferrosilicon production processes.
- All Elkem smelters have developed CO₂ roadmaps for 2031, estimating the feasibility of increasing bio-share for each plant.
- Verification of furnace operations with large volumes of agglomerated biomass from potential long-term suppliers is ongoing.

B: Shifting to renewable power in China

Future decarbonisation of China's power mix will support Elkem's low carbon transition.

C: Low-carbon supply chain

Actively pursue long-term sourcing of renewable-based silicon metal as well as emission-free logistics.

D: Exploring the potential of CCS at smelters

Exploring Carbon capture and storage (CCS) at our smelters. Elkem will test the world's first carbon capture pilot for silicon smelters at the plant in Rana, Norway.

E: Exploring CCU + recycling (and other initiatives)

Explore Carbon capture and utilisation (CCU). Joining forces with our customers to collect end-of life products to recycle chemically or mechanically. Use more biobased raw materials in Silicones, such as fermentation and hydrogenation of sustainably sources sugarcane.

[More information about the climate roadmap announced in October 2021 can be found here ↗](#)

8.3 Emission targets

Elkem has set absolute reduction targets for Scope 1 and 2, and scope 3, and targets for product carbon footprint (intensity) with reduction targets for Scope 1, 2 and Scope 3 upstream (to gate). Elkem will reduce fossil emissions in line with the Paris agreement. Our GHG emission reduction targets are classified as a well-below 2°C (2030) and 1.5°C (2050), aligned with the Paris Agreement. We, therefore, consider these targets as science-based targets since it meets the criteria, but the targets have not been approved by the Science-Based Target Initiative (SBTi).

Target	Year target set	Target Year	Scope	Target
Target 1	2021	2031	1, 2	28 % absolute reduction of emissions
Target 2	2021	2031	1,2,3	39% reduction in carbon footprint of products
Target 3	2021	2050	1,2,3	100 %* absolute reduction of emissions

*net zero

8.4 Biocarbon share targets

For Elkem to be able to reduce GHG emissions in line with science an important initiative is to reduce scope 1 emissions. A high share of biocarbon is important to reduce the impact our processes have on climate change. As CO₂ is inherent to the smelting process with current technology, one of Elkem's main CO₂ strategies is to replace fossil carbon with biocarbon in our smelting operations.

Target	Unit	Yearly biocarbon used at smelters	Target year	Target status
Target 1	%	20	2021	Achieved
Target 2	%	50	2031	New

In 2020, Elkem reached the biocarbon goal of 20% in Norway. In the following years the group share has also reached 20% of total emissions. Each plant has developed a roadmap and reports to corporate level on progress. To reach our target of an increased share of biocarbon, Elkem is actively engaged in new technology development and industrial partnerships. The announcement of an industrial pilot plant for biocarbon production in Canada is an example of this. Elkem works closely with partners to develop efficient, sustainable, and more environmentally friendly production of biocarbon for silicon and ferrosilicon production. It is a pre-requisite for Elkem that renewable sources comply with our strict environmental and social requirements.

8.5 Supplying the green transition metrics

The demand for Elkem's products is driven by global megatrends such as sustainability and clean energy demand growth e.g. solutions for the electrification of transportation, increased energy storage and batteries, reducing emissions and energy consumption, and the replacement of oil-based materials. One of Elkem's climate goals is to grow the market share in the green transition. One of our metrics is to look at the share of revenue that supports green development.

In the 2021 climate roadmap, Elkem launched an ambition to grow the supplies of advanced materials to the green transition markets by 5-10% per year. Elkem is currently working to define the KPIs, to be able to track this ambition towards 2031. In addition, the company has worked on understanding the green criterias of the EU Taxonomy that are relevant for Elkem. This will become mandatory reporting from 2023.

