



2022 TCFD Report

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

Figure 1: Recommendations and supporting recommended disclosures from the Task Force on Climate-related Financial Disclosures (adapted from TCFD, 2021)

1 Introduction

Climate change is one of the biggest challenges of our time. Reports from the UN Intergovernmental Panel on Climate Change (IPCC) show that people and nature worldwide are already being affected by various manifestations of global warming, and urgent action is needed to slow the pace of change and avoid further catastrophic impacts. Climate change affects the NG Group's core business by increasing physical and transition risks in the short, medium and long-term. NG Group will ensure that the company, its value chain, and its partners will work to achieve the Paris Agreement's climate goals and to reduce climate-related risks through its commitment to Science Based Targets initiative (SBTi).

The TCFD structures its recommendations around four thematic areas representing core elements of organizations' operations: governance, strategy, risk management, and metrics and targets. These four overarching pillars include a set of recommended disclosures to provide investors and other stakeholders

with information on how the companies assess climate-related risks and opportunities, related financial impacts and mitigation measures (Figure 1). Moreover, the framework separates recommended disclosures into two main categories: physical impacts of climate change and the risks associated with transitioning to a low-carbon economy (TCFD, 2021).

NG Group appreciates standardization in climate reporting and applied the TCFD framework and its disclosure recommendations for the first time in 2022. This report summarizes physical and transition climate risks and opportunities for the NG Group identified based on present time insights and future outlooks under different climate scenarios. It further highlights some examples of NG Group's assessment of potential physical climate risk at the facility level, as many of NG Group's activities are carried out at its facilities.

2 Governance

Climate risks affect several business areas, and NG Group is directly exposed to them in its operations and value chain. In a broader and more long-term perspective, climate risk can and probably will affect NG Group's insurance, financial, operational, business, and strategic risks.

Climate risk is integrated into the NG Group's corporate governance and risk management procedures. Identified climate-related risks are presented to the Board of Directors (BoD) by the Group Chief Sustainability Officer (Group CSO) as part of the annual risk reporting of the overall sustainability performance. The BoD is also informed about the climate strategy performance of different key projects through a bottom-up process and via presentations from business areas and business units.

The individual business areas of the NG Group are responsible for following up on climate and environmental risks as part of daily operations and systematic risk mitigation measures. Climate risk reduction measures will be monitored as an integral part of the risk management process, while climate-related opportunities are operationalized in the Group's strategy processes. Responsibilities for climate-related risks have been established between the BoD, the CEO, CEOs of the business areas and units, the CSO team, and selected representatives from the rest of the organisation. More details can be found in NG Group's Annual Report 2022 in a chapter on Corporate Governance.

The Board of Directors	Group CEO	CEOs of business areas and units	The CSO team
<p>The BoD approves sustainability objectives and strategy (administrative responsibility) and monitors the status of measures and their outcomes (supervisory responsibility). The BoD approves the NG Group's Annual Report for 2022 as a part of the annual assessment.</p>	<p>The Group CEO is ultimately responsible for monitoring, assessing, and managing climate-related issues, including climate-related risks and opportunities. In addition, the group CEO implements sustainability strategy throughout the Group, monitors the achievement of objectives, and reports the status of measures and their effects to the Board of Directors.</p>	<p>CEOs of business areas and units implement sustainability strategies and measures at the business area level. In addition, they are responsible for the day-to-day handling of climate risk exposure, mitigation and business opportunities.</p>	<p>The CSO team is a multidisciplinary team that follows up on measures and effects for the entire group to facilitate target achievement, as well as facilitates climate risk assessments.</p>

3 Strategy

This chapter analyzes climate-related risks and opportunities for NG Group through the lens of three scenario groups. It provides a deep dive into the scientific baseline for outlining the scenarios and their grouping, and several examples of assessments of physical climate risks to NG Group’s facilities in Norway.

Description of scenarios

TCFD recommends using forward-looking scenarios to assess the potential impacts of future physical and transition climate risks. Climate scenarios describe how the future may develop based on coherent and internally consistent assumptions about key drivers, including demography, economic processes, governance, technological innovation, and lifestyle (Chen, et al., 2021). It is important to note that scenarios are not predictions; they provide a “what-if” investigation of the implications of the various developments and actions (Moss, et al., 2010) and outline the related business context. The scientific baseline for outlining these scenarios is:

- the Shared Socioeconomic Pathways (SSP),

- the Representative Concentration Pathways (RCP),
- the IEA World Energy Outlook (WEO) 2022 Scenarios.

IPCC uses a combination of SSPs that provide qualitative narratives of how the society may evolve toward 2100, and RCPs, which provide information about corresponding future greenhouse gas (GHG) and aerosol emissions, and land use patterns. The WEO scenarios from the International Energy Agency (IEA) provide an in-depth analysis into the future of global energy system (IEA, 2022).

For the analysis, a selection of the corresponding scenarios was bundled into three scenario groups: “Insufficient climate policy scenario”, “Middle of the road scenario”, and “Well below 2 degrees scenario”. Furthermore, three time horizons - short (2022-2030), medium (2030-2050), and long-term (2050-2100), were chosen to assess NG Group's climate risks and opportunities. The choice is aligned with Norway's climate commitments to the Paris Agreement and the use of corresponding timeline for near-term (2030) and net-zero (by 2050) emission reduction targets. The long-term time horizon reflects the long life of the materials handled by the NG Group and the life of the NG Group's assets.

Time horizons are graphically illustrated in Figure 2, along with the projected development in CO₂ emissions in each of the three scenario groups over the selected time horizons. Figure 3 shows the global temperature rise range in the three scenario groups by the end of the century. Note that the WEO scenarios are only available until 2050. The sub-chapters below explore how the future might look like for the NG Group if each of these scenarios came to pass.

Well below 2 degrees scenario

In this scenario, the SSP1-2.6 and the two low-emission WEO scenarios - Announced Pledges Scenario (APS) and the Net Zero Emissions scenario (NZE) were considered. The APS assumes that all climate commitments announced by the governments will be met in full and on time, while NZE describes a pathway where the global energy sector reaches net zero emissions by 2050 (IEA, 2021). All three models described in this group show a pattern where CO₂ emissions peak at today's levels and then decrease (Figure 2). The SSP1-2.6 stays well below 2 degrees C compared to 1850-1900 levels and implies net zero emissions by the end of the century (Chen, et al., 2021). APS follows the same trend as SSP1-2.6 CO₂ emissions and assumes more than half of today's emissions by mid-century. The 2100 temperature for APS is below 2 degrees C with an upper 5th percentile span of up to 2.5 degrees C. In the NZE scenario, the emissions have a steeper drop and global energy-related emissions have reached net zero in 2050. The temperature is kept below 1.5 degrees C, with an upper 5th percentile up to 2 degrees C.

Middle of the road scenario

The SSP2-4.5 scenario expects an increase of emissions in the short term and a peak in CO₂ emissions by 2040. The temperature in this scenario spans between 2.7 and 3.4 degrees C although more countries

have adopted net zero targets by 2050. The temperatures do not drop significantly until the last quarter of the century. As shown in Figure 2, CO2 emissions are lower in the Stated Policies Scenario (STEPS) scenario however the temperature span is wider than the SSP2-4.5 scenario, ranging between 1.9 to 3.5 degrees C, with a median of 2.7 degrees C. Different from the SSP2-4.5, the STEPS have already reached the CO2 peak and continue to drop gradually toward 2050, as shown in Figure 2.

The insufficient climate policy scenario

The basis for this scenario is the SSP5-8.5 scenario. According to the Sixth Assessment Report by IPCC (Chen, et al., 2021), this is a high-reference scenario with no additional climate policy. CO2 emissions will continue to increase at a higher pace than previously experienced and will double by mid century. In 2090 the CO2 emissions will peak and then slowly drop (Figure 2).

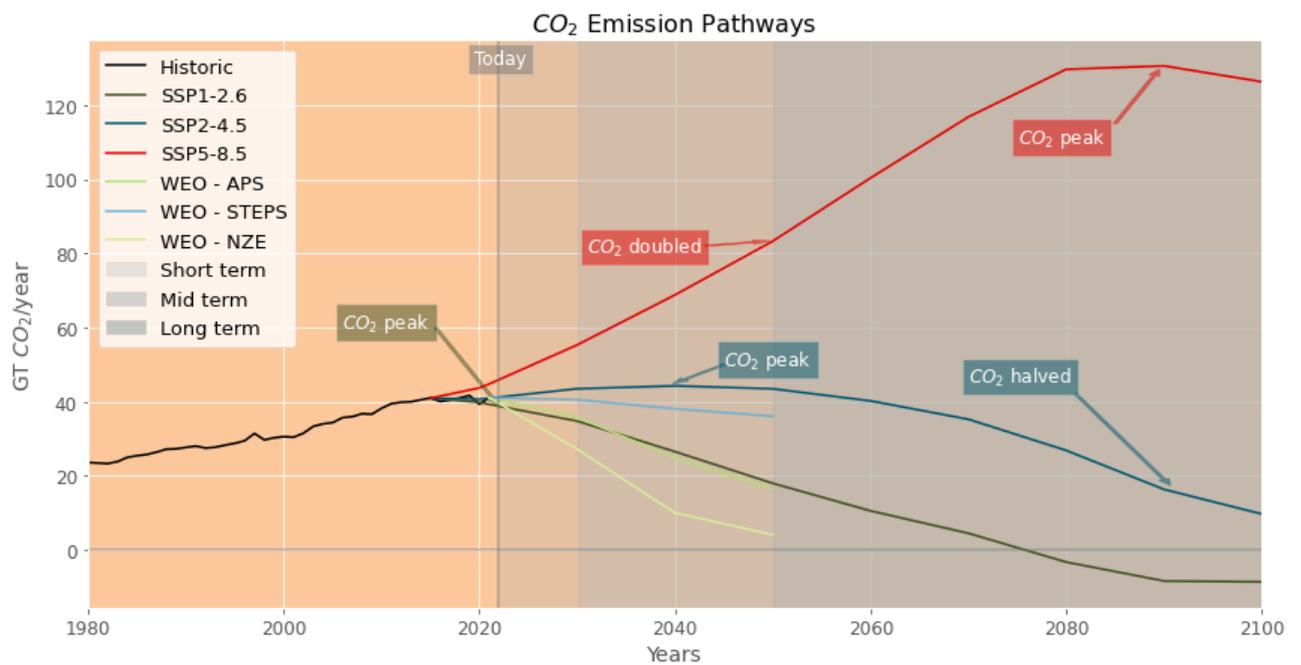


Figure 2: Projected CO2 emissions by scenario (grouped by colour). The time horizons are indicated by the fillinground shading.

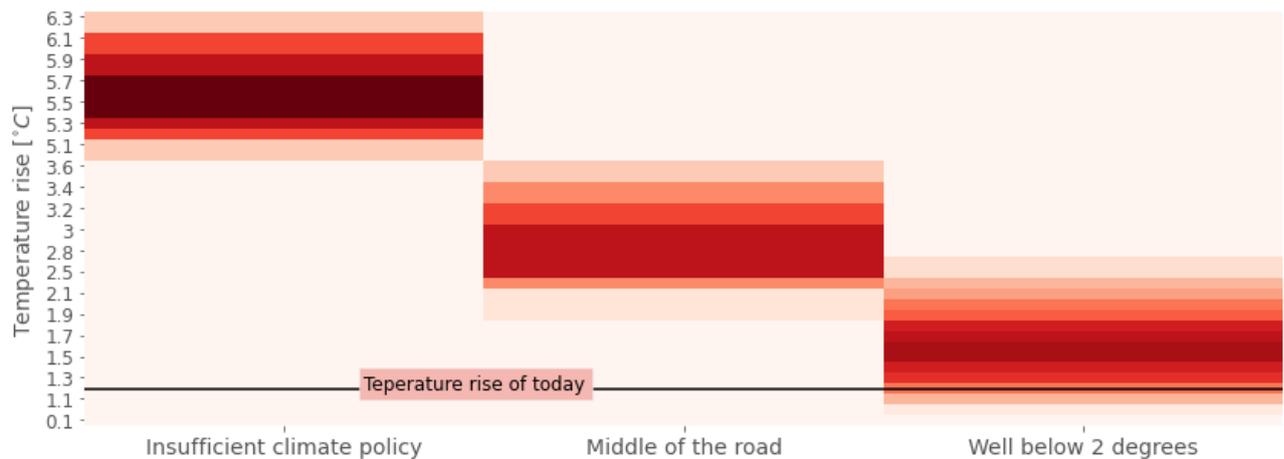


Figure 3: The range of global air temperature rise in the three scenario groups by the end of the century compared to pre-industrial levels (1850-1900).

Identification of physical and transition risks and opportunities

A specially-dedicated internal group comprising the CSO, representatives from the sustainability impact team, communications and technology was responsible for the identification and assessment of climate risks and opportunities. The time horizons (short, medium, and long-term) and severity in terms of potential impact were assessed for each risk and opportunity. Based on the recommendations of TCFD, physical risks are categorized into acute (event-driven) or chronic (longer-term shifts in climate patterns). The key identified risks and opportunities are discussed in detail below. The overview and brief description of identified risks and opportunities are also provided in the summary section at the end of the report.

Physical risks and opportunities

Risks

Floods and storm surges

The most severe acute climate risks for NG Group are floods and storm surges. Storm surges will likely be more frequent in the future due to the compounding effects of sea level rise and more dynamic and extreme weather patterns. Many of NG Group's facilities are located near harbors, and floods and storm surges pose a significant risk of damage to them and connected infrastructure. In addition, if large amounts of water suddenly flow through landfill areas and other facilities, it increases the risk of chemical leakage. Therefore, asset-specific adaptation measures should be assessed and mitigated at each facility to minimize the damage's extent.

Floods are heavily affected by changes in temperature and precipitation. In the report *Climate in Norway 2100* (Hanssen-Bauer et al, 2009), the authors have looked at floods with a return period of 200 years,

which means that the probability for such a flood to happen in a given year is 0.5%. Unexpected increases in sea level are usually due to storm surges. Different parts of the coastline in Norway have different expectations of sea level rise in a 200-year return period.

An assessment of floods and storm surges in different return periods at NG Group's facilities in Øra Environmental Park in Fredrikstad and Trondheim is presented below. These facilities are located in close proximity to the coastline and thus are particularly exposed.

Øra Environmental Park

Figure 4 shows the 10, 50 and 200-year return period for floods in the vicinity of the NG Group's plants in Øra Environmental Park. A similar analysis of storm surges is presented in Figure 5.

As seen from both figures, it is unlikely that the NG Group plants will be flooded. However, the surrounding infrastructure, including roads, can be heavily affected. Therefore, to mitigate the risks, NG Group must consider relevant on-site adaptation measures and contingency plans in the case of flooding.

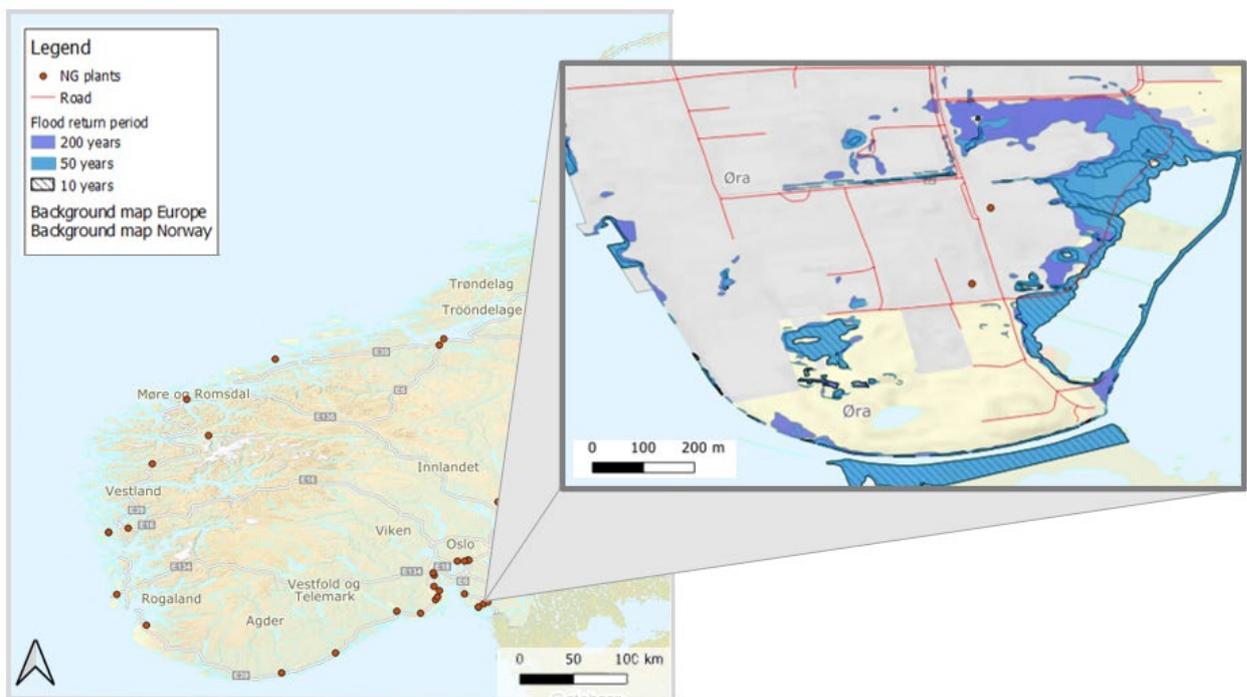


Figure 4: Flood in different return periods for two of NG Group's main facilities in Øra Environmental Park, which is located in close proximity to the coastline in South-Eastern Norway.

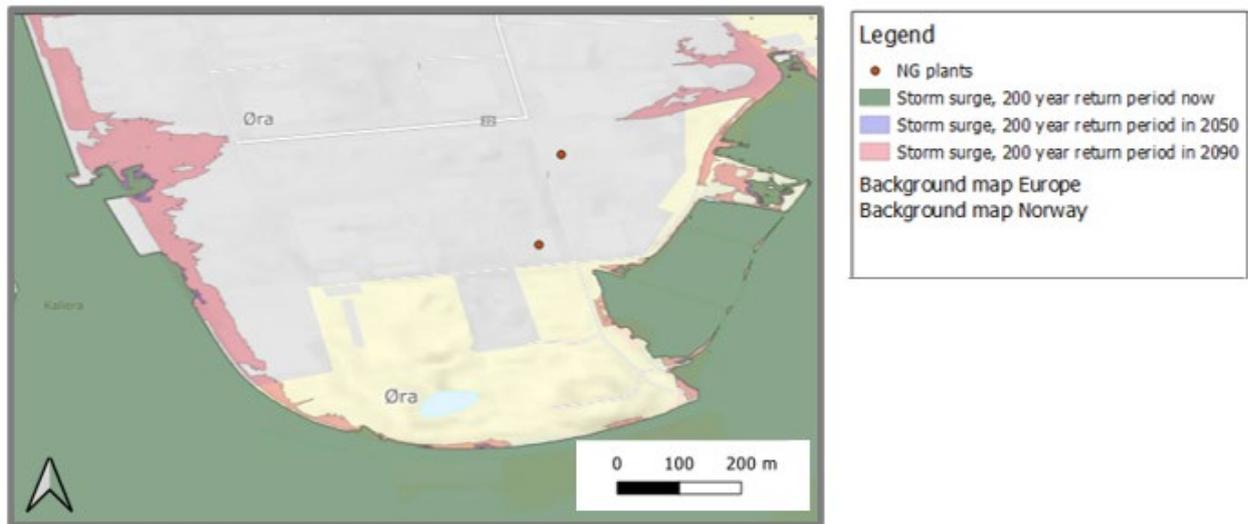


Figure 5: Storm surges in different return periods for two of NG Group’s main facilities in Øra Environmental Park which is located in close proximity to the coastline in South-Eastern Norway.

Trondheim facility

The estimated flood in all return periods affect the plant directly at the NG Group facility in Trondheim, as shown in Figure 6 below. An increase in rainfall, combined with changes in wind directions due to temperature change, will make such floods more prominent, leading to the plant being at continuous risk of flooding. According to (Wong, et al., 2016), the increase is expected to be 11 to 20% in the long term at the facility in Trondheim, making extreme floods much more likely than previously assumed. Storm surges, as seen in Figure 7 below, do not necessarily affect the actual plant as much, but the infrastructure around the plant is in risk areas. As in the case of the Øra Environmental Park, NG Group shall investigate measures to reduce flooding risks.



Figure 6: Flood in different return periods for one of NG Group's facilities in Trondheim.



Figure 7: Storm surges in different return periods for one of NG Group's facilities in Trondheim.

Extreme precipitation and associated flash floods and landslides

According to the Climate in Norway 2100 report (Hanssen-Bauer, et al., 2009), in a warmer climate, many parts of Norway will have more precipitation and extreme weather, such as heavy rain, leading to more surface runoff, flash floods and landslides. This constitutes a significant threat to the transport infrastructure as the collection and transportation of waste are of NG Group's core business, which makes the company heavily dependent on the road infrastructure. The potential mitigation measures include identifying key vulnerable elements of transport infrastructure and setting up monitoring and

short-term contingency planning (e.g., rerouting, change in schedule, etc.) based on high-resolution weather forecasts of extreme weather events.

Droughts

Droughts are prolonged periods with low precipitation leading to material water shortage. During droughts, the amount of particles in the air tends to increase, impacting how NG Group handles hazardous waste. Furthermore, prolonged droughts could increase the risk of fires at NG Group facilities. Several mitigation measures are already routinely implemented, such as additional fire inspections beyond regular work hours, the use of thermal cameras at the facilities to quickly detect overheating at an early stage, extra care to ensure the stocks are low and setting up fire extinguishing equipment in standby mode. Furthermore, NG Group provides information materials and fact sheets for customers and the general public, ensures a more thorough control during the reception of waste to eliminate unwanted goods from being processed, and runs pilot projects to detect batteries within the waste. It is anticipated that in a future climate, particularly under the "Insufficient climate policy scenario," the droughts-associated risks will increase, resulting in additional costs for insurance, water use, and other mitigation and adaptation measures.

In all three scenario groups described above, temperature and GHG concentration will affect the environment we live in, in some way or the other. In the Nordics, due to the geographical position, the changes might not be so noticeable in the short term, however in the mid and long term, one can see more physical changes happening to our surroundings (Hanssen-Bauer, et al., 2009). In the map below (Figure 8), NG Group’s main facilities in Norway are plotted along with changes in temperature in RCP 8.5 in the three chosen time horizons.

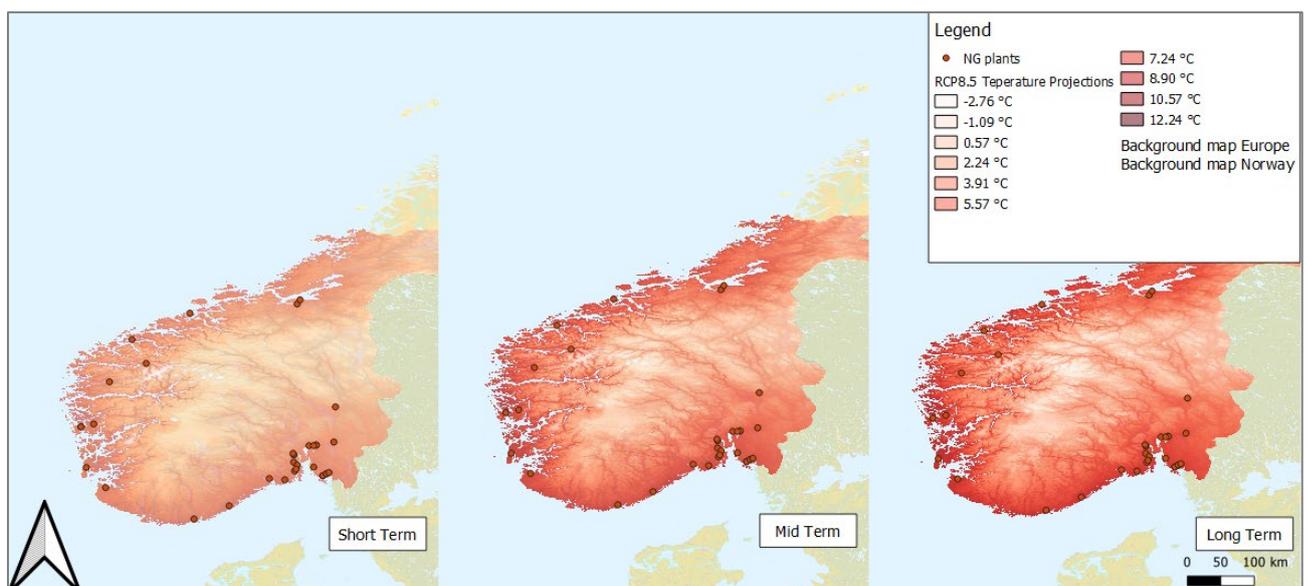


Figure 8: Temperature projections based on RCP 8.5 overlaid with locations of main NG Group facilities in Norway.

The temperature data is acquired from the Norwegian Water Resources and Energy Directorate's (NVE) climate and hydrological projections for Norway, which are based on an ensemble of ten EURO-CORDEX GCM/RCM simulations under RCP8.5 scenario (Wong, et al., 2016).

Opportunities

Water risk in the mining sector will boost recycling of materials

The mining sector is materially exposed to water risks. The spatial clustering of metals and minerals makes the mining locations particularly vulnerable. In addition, these locations are often in areas already affected by severe water scarcity. Further, recovering valuable metals from ore requires extensive amounts of water, which puts a lot of pressure on the local basin. As ore grades decline, the amount of water needed increases because more intensive processing is required. Thus, floods in these areas can have catastrophic consequences for water quality and damage to the surrounding ecosystems (Morgan and Dobson, 2020).

NG Group believes that the rising focus on value chain impacts related to products will further increase awareness of the value of recycling and provide additional opportunities for the waste management sector and material recycling where the NG Group operates.

Examples of climate change manifestations at two of NG Group's facilities

The examples below highlight detailed asset- and location-specific analysis of climate change impacts on two of NG Group's key facilities under different scenarios. The two facilities are chosen based on materiality in terms of operating activity and to show the range of our activities.

Groruddalen Environmental Park

Groruddalen Environmental Park (Groruddalen Miljøpark, Norwegian, GMP) is the biggest plant owned and operated by NG Group and is located on the north-eastern side of Oslo in an industrial park. The Figure 9 below presents changes in temperature, precipitation and runoff in different time horizons for GMP in RCP4.5 and RCP8.5, representing "Middle of the road" and "Insufficient climate policy" scenarios.

The temperature will remain stable in the short term for RCP4.5 and then increase by more than half a degree in the mid-term, continuing to increase by 1.4 degrees in the long term, compared to the 1985-2005 baseline. In RCP8.5 the temperature is projected to increase by almost 2.5 degrees compared to the base level in the long term.

According to RCP4.5, runoff decreases slowly in the short term and then experiencing a steeper decrease in the mid and long term. RCP8.5 shows an already steep decrease in the short term. Precipitation changes has more nuances in the various terms, however, an increasing trend is seen in both scenarios. The nuances can be explained by the expected increase in volatility of heavy rains.

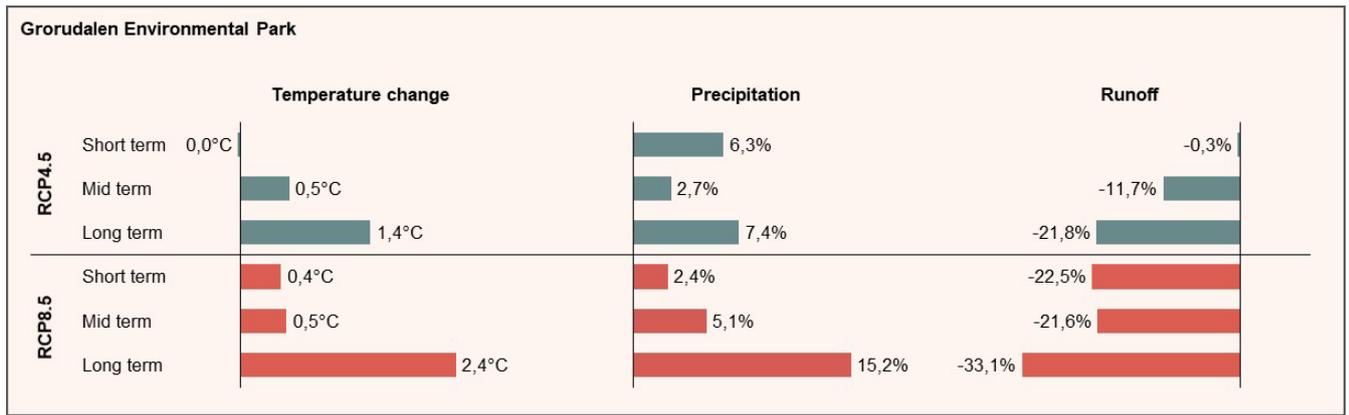


Figure 9: The figure above present in temperature, precipitation and runoff at Goruddalen Environmental Park compared to the historical mean (1985-2005) of 6.92 degrees C, 22.2 mm and 3.93 mm respectively.

Asak

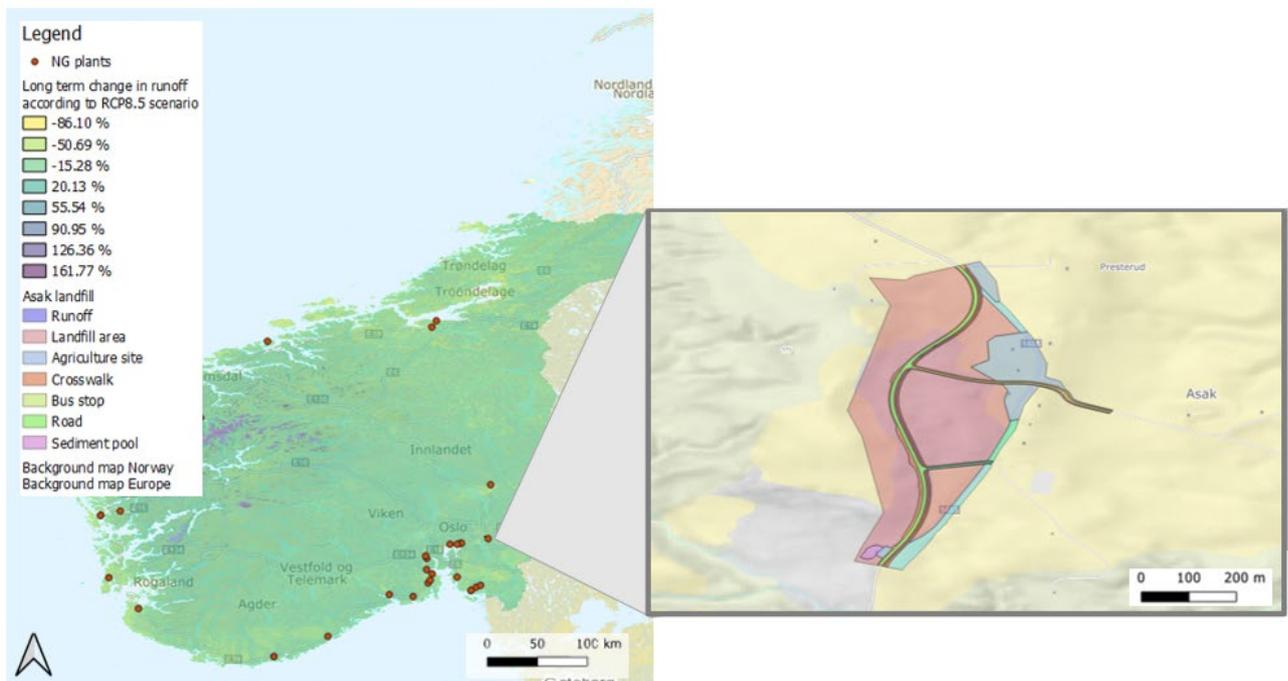


Figure 10: Runoff at Asak (mass reception facility operated by NGm3).

In the map above (Figure 10), an analysis of runoff at Asak mass reception facility is presented. This facility is operated by one of NG Group’s subsidiaries, NGm3. The facility receives polluted soil and polluted construction and demolition waste. These materials are reused as secondary raw materials in the construction of a public road.

As can be seen on the left side of the figure above and Figure 11, the runoff is expected to decrease in the future, linked to higher atmospheric temperatures. This will lead to less water flowing through the masses reducing the risk of water and soil contamination. On the contrary, heavy rainfall will increase in the coming years and 10-year events will be more prominent in warmer futures (Chen, et al., 2021; Wong, et al., 2016). There are several measures being taken to reduce the risk of contamination; among other

things, the leachate system is sized for a 200-year flood and is designed to lead leachate to a specific discharge point through a treatment plant.

Figure 11 shows how the local temperature, runoff and precipitation could develop in RCP4.5 (“Middle of the road scenario”) and RCP8.5 (“Insufficient climate policy scenario”). The changes represent the average data in the short, mid and long term, compared to the historical mean (1985-2005).

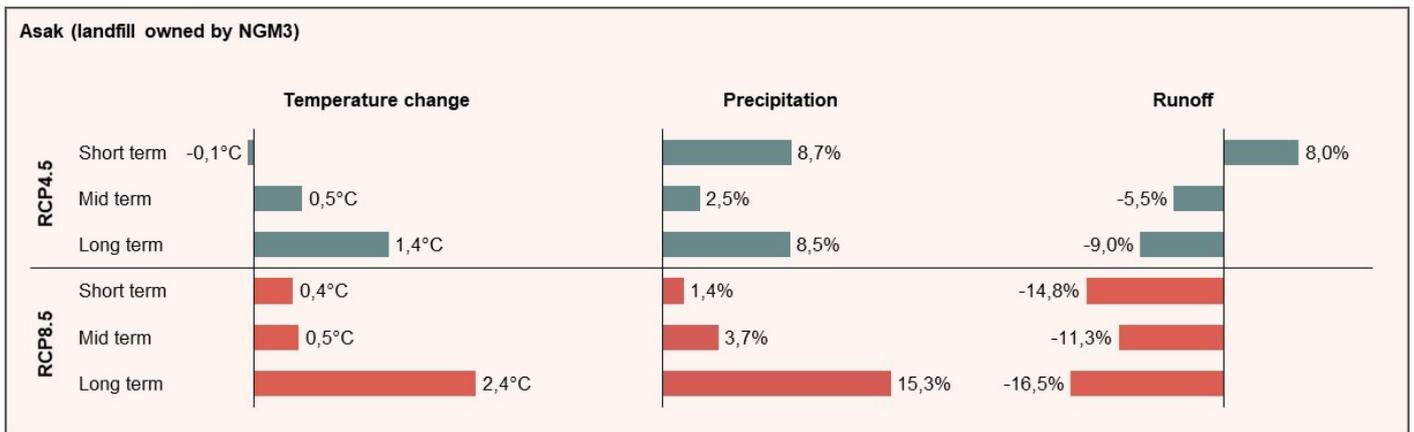


Figure 11: The figure above present changes in temperature, precipitation and runoff at Asak (ladfill operated by NGm3) compared to historical mean (1985-2005) of 6.07 degrees C, 21.86 mm and 5.62 mm, respectively.

Transition risks and opportunities

Transitioning to a lower-carbon economy, such as in the “Well below 2 degrees scenario”, would entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. The identified risks and opportunities connected to these categories are elaborated below.

Risks

Too slow adjustment to fossil-free vehicles among suppliers

A large proportion of NG Group’s operations are related to waste collection and transport. With an accelerated shift in fuel requirements, the company would struggle to adapt due to slow adjustment to fossil-free vehicles among its suppliers. The requirements could be met by shifting towards self-owned vehicles, although this would likely have a significant financial impact and reduce NG Group’s operational flexibility. There is also a risk related to investment timing into potentially immature technology and available infrastructure. Further mitigation measures will include engagement and close dialogue with key suppliers facilitating their timely transition to a fossil-free fleet.

Lack of renewable infrastructure

Further, an accelerated shift in fuel requirements would require the transport-related infrastructure to be established fast enough to meet the demand. DNV's Energy Transition Norway 2022 report predicts a 50:50 split between commercial electric vehicles (EV) and internal combustion engine (ICE) vehicles by 2040. Between 2040 and 2050, the report further predicts a shift from bioenergy to hydrogen (DNV, 2022). These predictions are based on announced net zero pledges and are thus a part of the "Well below 2 degrees scenario". Compared to the forecast from the DNV's Energy Transition Norway 2022 report, the NZE scenario implies an even faster transition requiring a full-scale shift from a mainly ICE-dominated to an electricity- and hydrogen-driven transportation sector (IEA, 2021). While the risk is universal for many companies in Norway, one possible mitigation measure is carefully considering future suppliers and their exposure to this risk.

Electricity deficit in Norway between 2026-2030

European electricity market is heavily affected by the ongoing war in Ukraine. In the coming decade, a report from DNV foresees a significantly increased electricity demand in Norway, while the production is expected to stay relatively flat. After a 10-year streak of net-electricity export, DNV anticipates a net import from 2026-2030 due to the electrification of Norwegian society (DNV, 2022). Climate change makes weather conditions more unstable and unpredictable. At the same time, society is transitioning to renewable energy with power production sources that are more weather dependent. Recently, in many regions of Norway, the lack of precipitation resulted in lower hydropower production leading to high electricity prices. Future climate change, particularly under the "Insufficient climate policy scenario", will likely further exacerbate electricity price fluctuations and more instability in the power market. Therefore, an opportunity for the NG Group lies within peak shaving and own energy production to be more self-sufficient. This could be achieved through battery storage, on-site power generation using solar panels, or vertical integration into waste-to-energy facilities. One existing example is solar panel installations at the KMT Gjenvinning facility at Lindestad, which provided approximately 15% of energy to the operations in 2021.

Competitors adapt better to climate requirements and win the market

In the transition to a circular economy, there is a significant risk of newcomers bypassing large established groups, such as the NG Group, due to faster adoption and new solutions. This is especially relevant regarding new recycling technology, traceability, and reuse business models. On the other hand, NG Group has a strong and established brand, infrastructure and technology within the circular economy space, which could mitigate this risk. Monitoring potential competitors and timely communication of the latest R&D developments is essential to maintain NG Group's credibility and market position in the future.

Increasing regulatory pressure and new reporting requirements

As a large group operating in a variety of industries, NG Group faces the risk of not being able to adapt to new regulations and reporting requirements given the high speed of development in this area. The regulations coming from the EU are among the most extensive. Due to the Corporate Sustainability Reporting Directive (CSRD), a set of EU standards for sustainability reporting (ESRS) must be adopted at the latest in 2025. The ESRS draft is built up of 11 ESG disclosure topics that define the future reporting requirements of the CSRD on a detailed level.

To meet these reporting requirements, NG Group needs to put extensive resources into building a system to monitor underlying data flows and find ways to measure the material impact on the disclosure topics. Therefore, the essential mitigation measure is to invest further in developing in-house competence and recruitment. The required competence is related to both sustainability topics such as climate and nature, but also the collection and processing of data where NG Group needs to build a culture around data governance and handling of data in all parts of the business to allow for data-driven solutions.

Increase in carbon prices

In 2021 the Norwegian government introduced a CO₂ tax on waste incineration, which was further increased in 2023. The new regulation means that NG Group must work with its customers toward waste reduction and find solutions that lift waste streams in the waste hierarchy and deliver less waste to incineration. Incineration plants with the carbon capture and storage (CCS) technology will increase prices. R&D projects within NG Group in order to developing alternative solutions are vital.

In addition to monitoring the developments around the incineration tax, NG Group will need to assess the implications of the EU Emissions Trading System (EU ETS) and the recently introduced EU's Carbon Border Adjustment Mechanism (CBAM), imposing a charge on the embedded carbon content of certain imported products. CBAM will be particularly relevant for the waste streams exported from Norway, forcing NG Group and other Norwegian companies in this sector to develop solutions locally.

NG Group believes that CO₂ prices will shift the fundamental economics of certain markets, especially for CO₂-intensive materials such as cement, steel, plastic and aluminium. This represents a great opportunity for reuse- and recycling solutions extending the life of such materials.

Opportunities

Recycling technology and reuse business models

A regulatory push towards a circular economy in the form of minimum requirements of recycled content in new products, reuse and life extension will lead to higher demand for circular materials in the “Well below 2 degrees scenario”. Meeting this demand will require investments in recycling technology and

business models for reuse. Early investment in environmental technology intended to lift waste higher in the waste pyramid and expand activities further down the value chain could make circular end-products a significant opportunity for NG Group. In the “Well below 2 degrees scenario”, NG Group customers are aware of the total life-cycle impact of materials. They are willing to pay a premium for circular materials and solutions to reduce their carbon and environmental footprint. For NG Group to fully grasp this opportunity would require competency building within materials and technology, and extensive investments in data-driven insight such as traceability of materials and waste streams.

Collaboration and partnerships across the value chain are critical in a circular economy because actors depend on each other for raw materials. Therefore, establishing new business models or technology in collaboration with other actors mitigates the risk and reduces the human and financial resources required from each party. Additionally, NG Group’s competence and technology represent a competitive advantage as NG Group has the potential to be the preferred partner in the “Well below 2 degrees scenario”.

A greater focus on recycling critical raw materials locally

An energy system powered by clean energy technologies differs profoundly from one fuelled by traditional fossil resources. The shift to a clean energy system is set to drive a considerable increase in the requirements for critical minerals such as copper, lithium, nickel, cobalt, manganese, graphite, and rare earth minerals. According to IEA, mineral demand for clean energy technologies will rise sixfold by 2040 in the NZE scenario, with particularly high growth for EV-related minerals (IEA, 2021).

The prospect of a rapid increase in demand for critical minerals raises questions about the availability and reliability of supply. The world’s top three producing nations (China, the Democratic Republic of Congo and Australia) control well over three-quarters of global output for lithium, cobalt, and rare earth elements (IEA, 2022). Therefore, price volatility and awareness of the value chains will put pressure on becoming less dependent on certain countries by keeping resources locally through recycling. This is especially the case for minerals critical for the transition in line with the “Well below 2 degrees scenario” as the production of many energy transition minerals is more concentrated than oil or natural gas reserves (IEA, 2021).

Summary of identified risks and opportunities

This report highlights key identified climate-related risks and opportunities for the NG Group (Figure 12). The most significant physical risks will likely impact NG Group’s facilities, infrastructure, and operations. Under the “Insufficient climate policy” scenario, the physical climate impacts will be more significant than today, requiring adequate adaptation measures at the facility level and a thorough consideration of new

locations. NG Group faces several transition risks. At the same time, this is an area where many opportunities for NG Group lie ahead as the world is transitioning to a low-carbon economy. The core business model of the NG Group is centered around waste management and circular economy, which are crucial activities to addressing ongoing climate and environmental crises, making the company even more resilient and relevant in a “Well below 2 degrees scenario”.

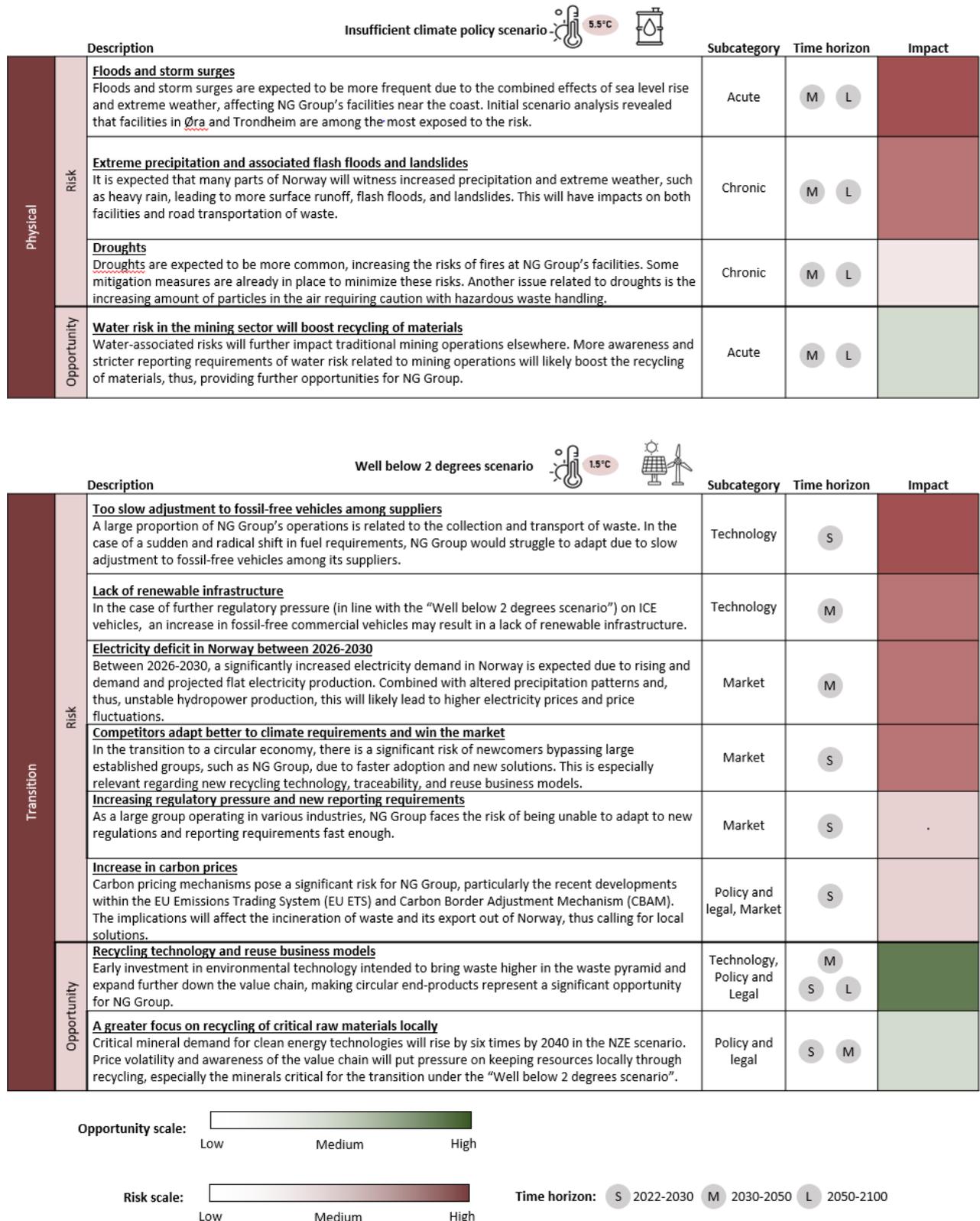


Figure 12: A summary of Identified climate-related risks and opportunities for NG Group

4. Risk Management

In general, climate risks are identified along with other risks on a running basis based on both a bottom up and top down approach. The most material risks and respective risk mitigation measures are presented and discussed yearly within the NG Group's Board of Directors (in June).

NG Group uses various methods for measuring and handling climate-related risks and opportunities. For example, a dedicated GIS analysis based on future hydrological and climate data from the NVE served as a basis for identifying current physical risks for the more than 30 locations in Norway. The risks and opportunities have been discussed and analyzed by an internal group through a series of workshops in 2022.

Specific climate-related risks are already integrated into the NG Group's corporate governance and risk management procedures. For example, physical climate risks related to droughts and the risks of fires at NG Group's facilities or transition risks require NG Group to address GHG emission reductions.

5. Targets and metrics

The table below presents the NG Group's Scope 1, Scope 2 and Scope 3 emissions. NG Group's climate accounts are prepared in accordance with the GHG protocol. A more detailed description of methods is outlined in the Climate Emissions section of the Annual Report 2022.

Table 1: An overview of NG Group's GHG emissions in 2022.

	2022
Scope 1	20 612 tCO ₂ e
Scope 2	14 406 tCO ₂ e
Scope 3	919 868 tCO ₂ e
Total	954 886 tCO ₂ e

In 2022, NG Group committed to setting emissions reduction targets for Scope 1, 2 and 3 emissions in line with the Science Based Targets Initiative (SBTi) framework. SBTi is a global initiative that defines and promotes best practices in GHG emissions reductions and net-zero targets in line with climate science. It validates corporate emissions reduction targets that align with the goals of the Paris Agreement and are backed up by concrete, technologically, and economically feasible emissions reduction plans.

6. The way forward

A holistic incorporation of climate-related issues into the strategic business development and financial planning in the NG Group is underway. During the successive iterations of the TCFD reporting, NG Group

plans to engage a broader spectrum of representatives from all platforms and include a more comprehensive analysis of facilities, also outside Norway. Since 2022 is the first year for structured and systematic work with climate risk assessment, NG Group has yet to assess the quantitative financial impact of identified material climate-related risks and opportunities, which will be the next step in future TCFD reporting. In the longer term, the group wants to consider the implications and impacts of climate-related risks and opportunities within the broader supply chains.

The current climate risks assessment contributes to NG Group's work with the EU Taxonomy for sustainable activities. In 2022, the NG Group carried out a taxonomy assessment pilot, where this climate risks analysis was the foundation for addressing the "do no significant harm" criterion related to the environmental objective of "Climate change adaptation". NG Group will further work towards more systematic ways to identify, assess and manage climate risks on the group level. Furthermore, additional work will be done to facilitate and coordinate climate risks assessment and management at the subsidiary level. NG Group will ensure broader stakeholder engagement in the risk assessment process to gain a more holistic understanding of the risks and opportunities, and to support the NG Group's risk management strategies.

7. References

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