

Task Force on Climate- related Financial Disclosures Report



Introduction

Albemarle is committed to aligning with the Task Force on Climate-related Financial Disclosures (TCFD), an initiative established by the Financial Stability Board (FSB). The following report represents Albemarle's first disclosure in line with the TCFD recommendations and reflects our actions and processes as of June 5, 2023 to better understand our climate-related risks and opportunities and their potential impacts on our business.

Our disclosure demonstrates the governance, strategy, risk management, and metrics and targets that are in place to enable us to manage these risks and opportunities. We will update our disclosures as our business evolves and we progress on our assessment and management of relevant climate-related risks and opportunities.

Governance

At the executive management level, our CEO and Chairman of the Board of Directors takes ownership of our greenhouse gas (GHG) emission reduction goals and our progress towards those goals. Our Board of Directors (Board) oversees our sustainability programs. Committees of the Board take the lead in discrete areas of oversight within their areas of responsibility.

The Health, Safety & Environment (HS&E) Committee is responsible for overseeing (among other items) our climate strategy including energy consumption and our greenhouse gas emissions. The HS&E Committee meets quarterly and our VP, Sustainability and Investor Relations reviews progress on our climate-related work, which includes energy and GHG emissions reduction targets. The Audit & Finance Committee of our Board reviews our enterprise risk management (ERM) at least annually, including climate change risks as appropriate.

In 2021, the HS&E Committee discussed and approved initial GHG reduction targets for individual global business units (GBUs). After announcing the resegmentation of our GBUs in 2022, the Committee approved updated GHG reduction targets and a new scope 3-related goal, which can be found in the [Metrics and Targets](#) section of this report.

In February 2023, the HS&E Committee was updated on our TCFD progress, including discussing the hotspot climate scenario analysis. The presentation included the top risks identified in the hotspot analysis, ranked based on estimated future magnitude of change in a 2030- and 2050-time horizon, and potential business impact rating based on discussion with numerous internal stakeholders. In May 2023, the full Board reviewed and discussed the results of our first TCFD analysis and integration into Albemarle's ERM process.

Strategy

Assessing Climate-related Risks and Opportunities Using Scenario Analysis

We conducted a high-level review of potential climate-related risks and opportunities focusing on our two core business units: Energy Storage and Specialties. We worked together with climate consultancy South Pole and cross-functional internal stakeholders via a series of workshops and interviews to develop an initial list of climate-related physical and transition risks and opportunities that could impact our two core business units. Following further internal stakeholder consultation, we prioritized risks and opportunities based on their potential impact for further assessment via climate scenario analysis.

Our initial assessment of climate-related risks and opportunities was undertaken in two stages. For the first stage of the assessment, which took place from July to August 2022, we selected 29 risks and opportunities for a qualitative hotspot scenario analysis. The goal of this analysis was to understand the future dynamics that could increase or decrease potential impacts of these risks and opportunities for Albemarle. The results were further discussed with respective internal stakeholders, and nine risk and opportunities were chosen for a more in-depth assessment based on their potential impact to the business. The results from the in-depth analysis are currently being assessed with the appropriate function leads, as well as being integrated into our regular ERM process.

Phase 1: Hotspot Qualitative Scenario Analysis

In alignment with the TCFD recommendations, we used the following key concepts for our hotspot analysis.

Risk and opportunity categories:

- *Physical risks and opportunities*: linked to the impact of acute risks (event-driven) and chronic risks (longer-term shifts in climate patterns).
- *Transition risks and opportunities*: linked to the impact of a transition to a lower-carbon economy, covering the core categories defined by the TCFD: policy and legal, technology, market, and reputation.

Scenarios: We evaluated the projected change in the risks and opportunities under different potential future states of climate change, or ‘climate scenarios’. Climate scenarios describe possible future emission pathways and the associated rise in global temperature and changes to the climate system based on a series of assumptions regarding political, technological, socioeconomic, and physical changes to the environment. We evaluated physical risks against a ‘high physical impact scenario’ (high global warming, aligned with a 4°C temperature increase) and transition risks and opportunities against a ‘rapid low-carbon transition scenario’ (limited global warming, aligned with a 1.5°C temperature increase), which are described in the table at right:

Physical risks and opportunities

RCP (Representative Concentration Pathway) 8.5, a high-impact scenario

The RCP 8.5 scenario, provided by the Intergovernmental Panel on Climate Change (IPCC), represents the most ‘extreme’ scenario from a physical climate change perspective, assuming a future where almost no mitigation action is taken, emissions continue to rise at the current rate, and global mean temperature increases by 4°C by the end of the century relative to the pre-industrial period. Under this scenario, significant changes in the frequency and intensity of acute and chronic physical risks already occur by mid-century.

Transition risks and opportunities

Net Zero Emissions by 2050 Scenario (NZE), a 1.5°C-aligned scenario

The NZE scenario, provided by the International Energy Agency (IEA), presents a pathway to effective climate mitigation which sees global energy sector CO₂ emissions reach net zero by 2050, while also taking into consideration other sustainable development goals such as universal access to energy and air quality improvements. This scenario presents a potential path to net zero emissions that is achieved via greater international cooperation, governments significantly strengthening and successfully implementing energy and climate policies, rapid deployment of renewable and efficient energy technologies, and a progressive shift towards electrification as electricity generation becomes increasingly clean. By 2100, this scenario results in an increase in global temperatures limited to 1.5°C above pre-industrial levels with no or limited overshoot (with a 50% confidence level). While the NZE was used as the main scenario in this assessment, information from the IEA’s Sustainable Development Scenario (SDS) (which holds temperature rise to 1.6°C, with a 50% confidence level), as well as national / regional and sector-specific scenarios, projections, and plans, were also used.

Time horizon: Albemarle considered two-time horizons for this assessment:

- Medium term: We consider the medium-term in relation to climate-related risks and opportunities up to 2030.
- Long-term: We consider the long-term in relation to climate-related risks and opportunities up to 2050.

While changes in physical risks are projected to materialize more strongly in future decades, the analysis of transition topics is more relevant in the medium-term than in the long-term. This is because the evolution of business conditions beyond 2030 is subject to very high uncertainty.

Phase 2: In-Depth Scenario Analysis

After completing the hotspot scenario analysis, we undertook an in-depth scenario analysis from late 2022 to early 2023. To identify the most material topics for an in-depth assessment, we considered the estimated future magnitude of change in the risks and opportunities from the hotspot analysis, internal stakeholders' perception of their potential impact on the business, and the existing internal measures in place or planned to manage the risks and opportunities. Albemarle's internal ERM impact matrix framework was used as a foundation to score and weigh the relative potential impact of each risk and opportunity. More information on our ERM processes can be found in the [Enterprise Risk Management](#) section of our 2022 Sustainability Report.

Physical Risks

Physical risks including freezing events, heatwaves, tropical cyclones, water scarcity, wildfires, thunderstorms, heavy precipitation, and riverine and coastal flooding were rated on qualitative scale from low to very high based on the projected future magnitude of change in these topics compared to the current baseline, covering a range of key countries/regions from Albemarle's value chain (including the U.S., Jordan, Chile, China, Australia, and the West Pacific). Country- and site-specific risks were chosen based on their strategic importance and contribution to revenue and value chain continuity, as well as Albemarle's experience and feedback from key internal stakeholders.

The risks determined to have the highest potential material impact to Albemarle's operations and selected for further assessment via in-depth scenario analysis were water availability in Chile and Jordan, thunderstorms in the U.S., and heat extremes and impacts on power supplies in China. These risks are outlined in the following figure, along with a summary of the results of the hotspot analysis under the RCP 8.5 scenario. The climate risk ratings reflect the magnitude of change in the climate risk from the current baseline and do not consider the associated business impact or mitigation measures already in place.

Key physical risks identified based on hotspot analysis results

| | | Climate Risk Rating | |
|---|--|---------------------|-----------|
| | | 2030 | 2050 |
| 5 | Water scarcity, declining precipitation & drought: Jordan | Moderate | High |
| 4 | Water scarcity / drought: Chile | Moderate | Uncertain |
| 4 | Heat & extreme temperatures: China | Moderate | High |
| 4 | Thunderstorms: U.S. | Moderate | High |

Albemarle business impact:



(Albemarle business impact ratings were estimated based on review of Albemarle's existing ERM and discussions with internal working team)

1. Dry periods are measured in maximum number of consecutive dry days (CDDs)
2. Evapotranspiration is a process by which water is transferred from the land to the atmosphere via evaporation and transpiration

Transition Risks and Opportunities

Transition risks and opportunities across four main areas - policy and legal, technology, market, and reputation - were rated on qualitative scale from low to very high based on the projected future magnitude of change in these topics compared to the current baseline, covering a range of key countries from Albemarle's value chain (the U.S., Chile, China, Australia and Europe), with some cross-cutting risks and opportunities evaluated at a global level.

We further assessed via in-depth scenario analysis for the most relevant opportunities (growth of the electric vehicle market and expansion of battery recycling) and risks (greater regulation of lithium-ion batteries in Europe, potential loss of customers linked to climate performance, and carbon pricing). These risks and opportunities are outlined in the following figure, along with a summary of the results of the hotspot analysis under a 1.5°C scenario. Again, the climate risk ratings reflect the magnitude of change in the climate risk from the current baseline and do not consider the associated business impact or mitigation measures already in place.

Key transition risks and opportunities identified based on hotspot analysis results

| | | Climate Risk Rating | | |
|---------------|--|---------------------|------------------------|--|
| | | 2030 | 2050 | |
| RISKS | 3 Carbon pricing <ul style="list-style-type: none"> Carbon prices are expected to increase rapidly posing a potential financial risk Increases in carbon prices could increase Albemarle's operating costs directly (via a carbon price on industry) or indirectly (e.g., via a price on power- / energy-sector emissions, or if carbon costs are passed through the supply chain by Albemarle's suppliers) | High ¹ | Very High ¹ | |
| | 5 Loss of customers linked to climate performance² <ul style="list-style-type: none"> Increasing regulations targeting product life cycle emissions (spearheaded by the EU) and/or customer action towards achieving net zero value chain ambitions is expected to accelerate in the 2030-2050 period Pressure on Albemarle to improve its climate performance in line with best practice is expected to grow | Low | Moderate | |
| | 4 Regulation of Li-ion batteries <ul style="list-style-type: none"> The EU's draft Battery Regulation will set increasingly stringent requirements relating to the life cycle carbon footprint of batteries Requirements for increasing recycled lithium share and recovery could also impact primary lithium demand The regulation represents a potential blueprint for future international legislation, with regulatory expansion expected | Moderate | High | |
| OPPORTUNITIES | 5 Expansion of low-carbon mobility <ul style="list-style-type: none"> Rapid growth in low-carbon mobility is expected to continue Electric cars are expected to account for ~60% of annual car sales globally by 2030, with annual battery demand for EVs more than doubling between 2030 and 2050 Albemarle is well positioned to capitalize on significant revenue opportunities available | Very High | Very High | |
| | 4 Expansion of battery recycling <ul style="list-style-type: none"> The number of EV batteries reaching the end of their first life is expected to increase rapidly into mid-century alleviating but not eliminating the need for primary raw material supply EU Battery Regulation establishes mandatory recycled lithium content criteria, recycling efficiency and material recovery rates with other jurisdictions expected to follow suit, presenting revenue opportunities for companies in the recycled lithium market | Low | High ³ | |

Albemarle business impact:



(Albemarle business impact ratings were estimated based on review of Albemarle's existing ERM and discussions with internal working team)

- This score reflects highest ratings of countries investigated: the U.S., China, Chile and Australia.
- This analysis took into account Albemarle's direct customers only and is not reflective of customers in the wider value chain. The wider value chain will be taken into consideration in the in-depth assessment.
- Projections to 2050 were not available in the scenarios, therefore this rating is reflective of a 2040 time horizon.

In-depth scenario analysis of the nine physical and transition risks and opportunities highlighted above is expected to be completed in 2023. We plan to consolidate the TCFD-related analysis into our corporate ERM process, further develop and deploy mitigation plans for our identified climate risks and integrate results into our long-range business plans and strategy.

Business Resilience

Climate change has been identified as one of the most pressing issues of our time. In 2021, we issued the [Albemarle Climate Strategy](#) in which we outline our approach and responsibility to address the impact of our operations on the environment. We support the goals of the Paris Agreement to reduce climate change by limiting global warming to well below 2°C and pursue efforts to limit global warming to 1.5°C. Reducing our carbon footprint is not only the right thing to do, but also strengthens our competitive position, improves our operational efficiency and creates value for our stakeholders.

The analysis above highlights the most likely severe climate change-related risks to our business, and accordingly the areas where risk mitigation is the most important. We plan to use the results of this scenario analysis to collaborate with function leads across Albemarle to develop specific risk mitigation strategies. For example, we are already developing water preservation strategies in Chile and Jordan, as well as a renewable energy strategy. We are also staying up to date on emerging EU battery regulation and building our lithium recycling capabilities. Climate risk mitigation is an important component of our Climate Strategy, and understanding those risks now allows us to plan and prepare for the future impacts of climate change on our business.

In addition to risk mitigation strategies, we also plan to align our business strategy to address key the climate-related opportunities identified. We recognize that the energy transition is crucial for mitigating climate change, and our company is one of the key suppliers of materials required for this process. The lithium we produce is used for electric vehicle batteries and bromine is an element for safe electrification. We resegmented our business units effective January 1, 2023, to reflect our commitment to supporting energy transition and to recognize our role as one of its suppliers. By orienting our business towards the growth opportunity that the energy transition can provide, we recognize the importance of operating in a safer and more sustainable manner. We are incorporating projects and incentives to reduce our carbon footprint into our near- and long-term planning, since our business results inherently depend on the rapid decarbonization of the global economy.

Risk Management

Risk management is essential to continuing to build the resilience of our company. To reflect the importance of risk management in Albemarle, we introduced the role of Chief Risk Officer in 2022. Our Chief Risk Officer has worked closely with members of our corporate sustainability function on our TCFD scenario analysis, and the results will be integrated into our company's ERM program.

The Chief Risk Officer role also takes responsibility for our ERM program. Albemarle's ERM program identifies and defines risks, including climate risks, that could significantly impact shareholder value on a sustained or permanent basis. Our ERM program helps us to assess key risks, identify gaps, and develop and implement risk mitigation efforts. This information is then integrated into our annual and long-range planning processes.

We prioritize risks using quantitative and qualitative factors that assess risk likelihood and risk severity. We also test our risk mitigation and management activities with a broad group of relevant internal stakeholders. For more information on risk management at Albemarle, see the [Business and Financial Resilience](#) section of our 2022 Sustainability Report.

Metrics and Targets

In line with TCFD recommendations, we are disclosing below our scope 1, 2 and 3 GHG emissions from our 2019 target baseline to our most recent reporting year, 2022. We also have listed below our recently restated GHG emissions reduction targets. For more information on our metrics, see the [Performance Data](#) section of our 2022 Sustainability Report.

| THOUSAND METRIC TON CO ₂ e | 2022 | 2021 | 2020 | 2019 |
|---------------------------------------|-------|-------|------|------|
| Scope 1 GHG emissions | 618 | 605 | 585 | 607 |
| Scope 2 GHG emissions, market-based | 292 | 294 | 350 | 358 |
| Scope 2 GHG emissions, location-based | 334 | 348 | -- | -- |
| Scope 3 GHG emissions | 1,994 | 1,675 | -- | -- |

'--' denotes the corresponding data was not collected during the respective year.

Targets:

- Grow our Energy Storage business in a scope 1 + 2 carbon-intensity neutral manner through 2030
- Reduce the scope 1 + 2 carbon-intensity of Specialties by 35% by 2030 in alignment with science-based targets
- Reduce the scope 1 + 2 carbon-intensity of Ketjen by 35% by 2030 in line with science-based targets
- Engage with suppliers to collect 75% (by 2023) and 90% (by 2024) primary data of our raw material carbon footprint

For more information on our target setting, see the [Letter from the Sustainability Steering Committee](#) section of our 2022 Sustainability Report.