MORNINGSTAR® | SUSTAINALYTICS

Material Risk Engagement

2024 Q4 Report

Material Risk Engagement promotes and protects long-term value by engaging with high-risk companies on financially-material ESG issues.

Table of Contents

Engagement Approach

Morningstar Sustainalytics' Material Risk/Strategy & Risk Engagement engages with high-risk companies on the material ESG issues with the greatest levels of unmanaged risks. The purpose is to protect and develop long-term value in our clients' portfolio companies. Material Risk/Strategy & Risk is an engagement overlay of Sustainalytics' flagship product, ESG Risk Ratings.

The Stewardship team will engage with companies in Morningstar Sustainalytics' Ratings universe, consisting of more than 4,500 investable issuers in developed and emerging markets, which have an ESG Risk Ratings score of 30 or more. The ESG Risk Ratings score reflects the unmanaged ESG risk, so the higher the score, the more risk the company is exposed to.

The engagement is driven by constructive dialogue. The research from the ESG Risk Ratings and the Controversies research are leveraged to encourage companies to cover gaps in Material ESG Issues risk management. Engagement Response, Progress, Positive Developments, and Milestones are consistently tracked to measure commitment and capability to change in addition to the engagement activities conducted. When a company improves by bringing the ESG Risk Ratings score to below 28, the Material Risk/Strategy & Risk Engagement case will be considered resolved.

Executive Summary

Paulina Segreto
Director, Stewardship
Morningstar Sustainalytics

Highlights for the Quarter

The companies we engage with have shown rapid improvement, allowing us to resolve eight engagements in the last quarter of the year. This occurs when companies achieve an ESG Risk Rating below 28, moving into the Medium ESG Risk Rating category and reducing overall unmanaged ESG risk. Additionally, several companies were removed from our target list and archived due to universe updates in Q4.

During Q4, the team has:

- Conducted 47 meetings.
- Exchanged 478 emails/phone calls.
- Tracked 59 Positive Developments.
- Recorded 40 Milestones achieved.

As anticipated, the high number of Positive Developments and Milestones is attributed to new company disclosures published late in the year.

Unique Climate Risks in the Great Lakes

This quarter we worked on an overview of physical climate risk present in North America's Great Lakes region. Climate change-induced snowfall in this region presents significant physical and financial impacts. Investors should be aware of the potential effects on corporate assets and business operations. The unique aspects of the Great Lakes region, coupled with increasing extreme snowfall events, highlight the importance of proactive risk management and investment in resilience.

European Investor Trip

In November 2024, we embarked on a field trip to understand how European industry leaders are navigating the complexities of the energy transition. We conducted site visits and corporate meetings with stakeholders ranging from senior management to engineers and plant operators.

The trip spanned Germany, France, and Spain, covering key sectors such as utilities, chemicals, steel, industrial gases, and construction. Central to the discussions were topics like the economics and use cases of green hydrogen, industrial electrification, large-scale green ammonia generation, solar park innovations, decarbonizing feedstocks, and the demand for low-carbon products.

Looking Ahead

In Q1 2025, we anticipate an increase in our engagement activities, with plans to close older engagements and initiate new ones.

Engagement Overview

310
engagements as of 31 December 2024

3
new engagements

598
companies engaged since March 2020

SDG 13 Climate Action
linked to 65% active engagements

Asia / Pacific
region with the largest number of engagements

Oil & Gas Producers and Utilities
industries with the most engagements

Disclosure and Net-Zero/Decarbonization
top material ESG topics in engagement dialogues

Engagement Status

When we open an engagement, the status is Engage. We will then pursue engagement until we change status to:

Resolved	The company has achieved the engagement objective.
Archived	Engagement is concluded, the engagement objective has not been achieved.
Unresponsive	Unresponsive is the final step in the escalation for companies not responding to our engagement. At this final step, we have exhausted all other engagement tools.

322 engagements as of 01 October 2024

3 new Engage

8 Resolved

7 Archived

0 Unresponsive

310 engagements as of 31 December 2024

325 engagements during Q4 2024

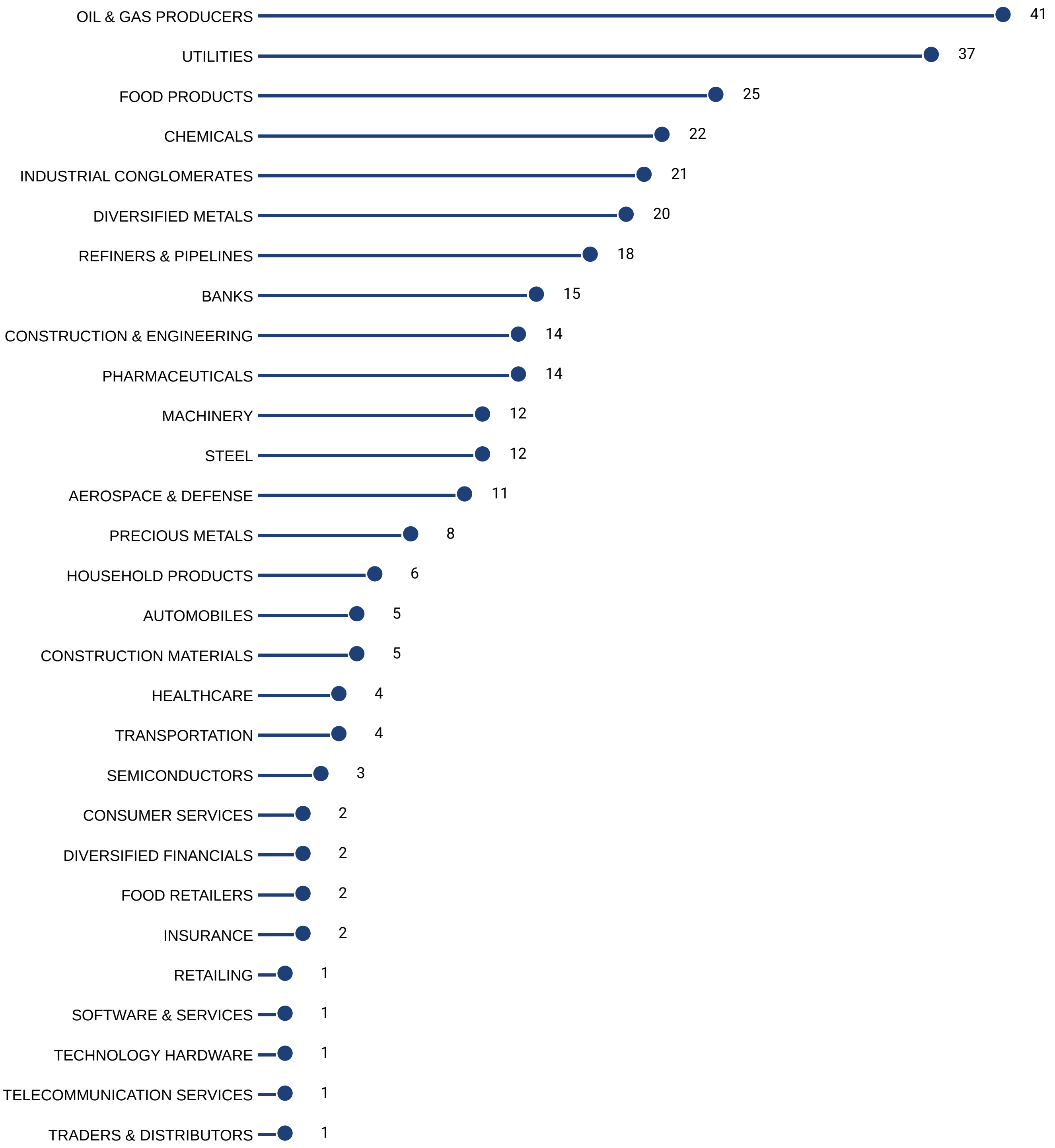
On a regular basis, universes are rebalanced and issuers might therefore be removed from our data set. Corporate changes can also affect case status. In such circumstances, opening and closing engagement counts will not match. Impacted companies may or may not overlap with investor holdings.

Active Engagements by ESG Risk Ratings Categories

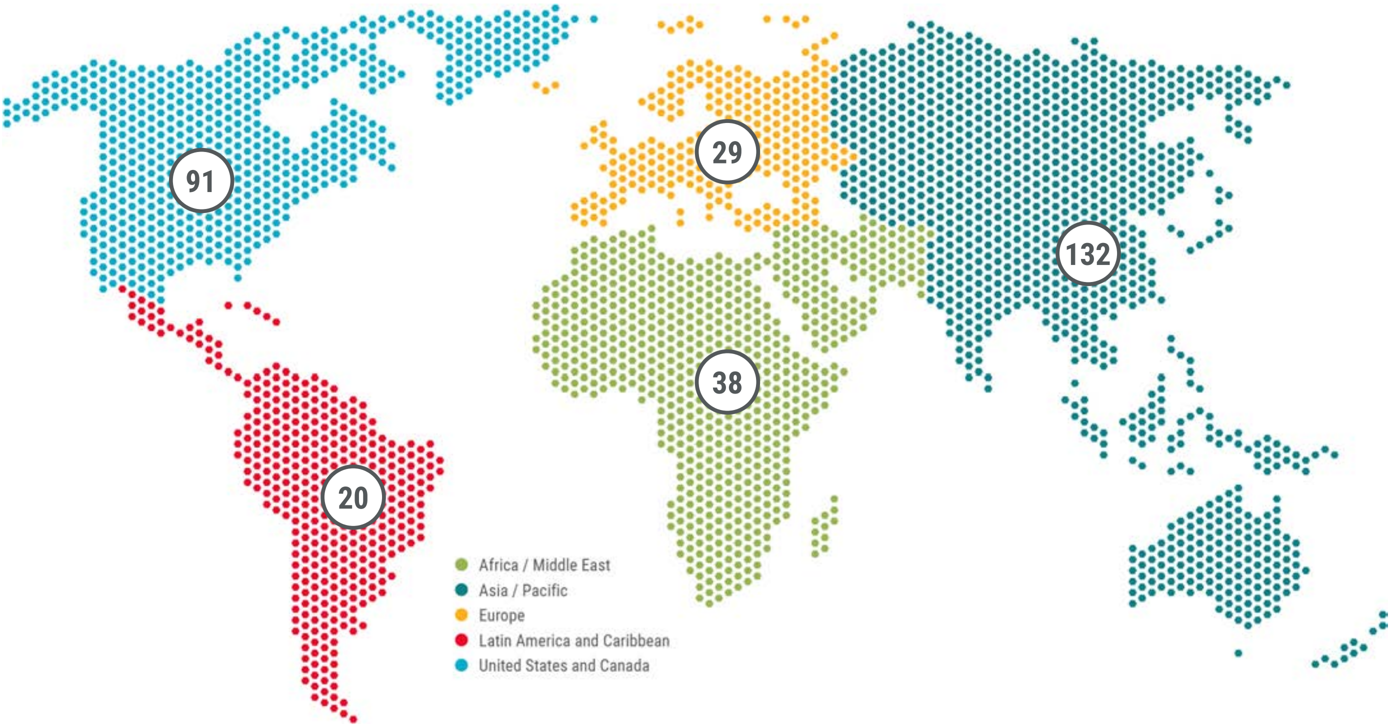
Active Engagements by ESG Risk Ratings Categories

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)
		16% (28-30)	69%	15%

Industry Distribution



Engagements by Headquarter Location

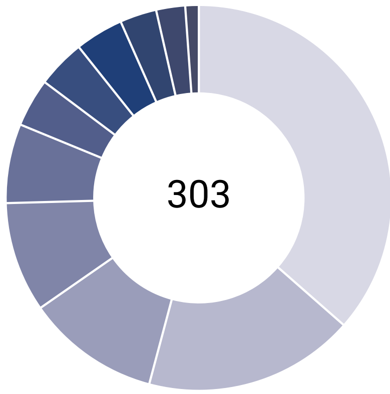


Engagement Topics

During the reporting period, our engagements addressed a number of topics across the environmental, social and governance pillars.

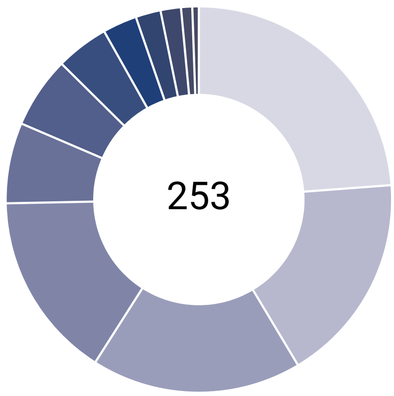
Environmental

- NET-ZERO/DECARBONIZATION (112)
- CLIMATE CHANGE (54)
- WATER SECURITY (34)
- WASTE MANAGEMENT (28)
- WATER QUALITY (20)
- AIR POLLUTANT EMISSIONS (12)
- BIODIVERSITY (12)
- LAND POLLUTION AND SPILLS (12)
- NATURAL RESOURCE USE (9)
- DEFORESTATION (7)
- CIRCULAR ECONOMY (3)



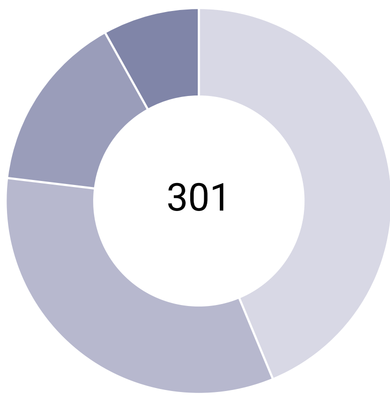
Social

- PRODUCT QUALITY AND SAFETY (61)
- COMMUNITY RELATIONS (45)
- HUMAN CAPITAL (45)
- OCCUPATIONAL HEALTH AND SAFETY (40)
- HUMAN RIGHTS (17)
- DIVERSITY, EQUITY AND INCLUSION (DEI) (15)
- DATA PRIVACY AND SECURITY (11)
- MARKETING PRACTICES (5)
- INDIGENOUS PEOPLE (7)
- HIGH-RISK TERRITORIES (2)
- LABOUR RIGHTS (4)
- JUST TRANSITION (1)



Governance

- DISCLOSURE (132)
- ESG GOVERNANCE (100)
- BUSINESS ETHICS, BRIBERY AND CORRUPTION (45)
- BOARD COMPOSITION (24)



Note: An engagement can cover one or more issues and objectives reflected in overlapping issue statistics.

Sustainable Development Goals - Mapping Engagements

All engagements are mapped to the 17 UN Sustainable Development Goals (SDGs). The mapping is done by Morningstar Sustainalytics and refers to the focus and objective(s) of the engagement.

1 No Poverty	0%	10 Reduced Inequality	2%
2 Zero Hunger	1%	11 Sustainable Cities and Communities	22%
3 Good Health and Well-Being	12%	12 Responsible Consumption and Production	51%
4 Quality Education	0%	13 Climate Action	65%
5 Gender Equality	3%	14 Life Below Water	1%
6 Clean Water and Sanitation	7%	15 Life on Land	5%
7 Affordable and Clean Energy	22%	16 Peace and Justice, Strong Institutions	56%
8 Decent Work and Economic Growth	22%	17 Partnerships to Achieve the Goal	3%
9 Industry, Innovation and Infrastructure	15%		

Case Study: UGI Corp.

Material Risk/Strategy & Risk Engagement - Engagement Since: 05 March 2020

Industry: **Utilities**

Country: **United States**

ESG Risk Rating: **28.2**

UGI Corp. (UGI) is an American holding company that, through its subsidiaries (natural gas and propane operations as well as electric utilities), is involved in the transport and marketing of energy and related services. The company derives a majority of its revenue from the UGI International segment, which consists of its liquified petroleum gas (LPG) distribution businesses.

Progress: **Good** | Response: **Excellent** | Latest Milestone: **4**

Engagement Update

Six conference calls have taken place with UGI since starting the engagement in February 2020. In early 2024, UGI achieved a Risk Rating score below 30, bringing the company into the Medium Risk Rating category. UGI is very responsive to our communications and requests for conference calls. The most recent dialogue with UGI took place in November 2024.

Focus Area

Topics discussed in November included an update on the company's completion of its strategic review exercise, its ESG targets and performance, and material ESG issues including physical climate risk management for Product Governance as well as Community Relations, and Emissions, Effluents and Waste.

Engagement Outcomes

In its 2023 ESG Report, UGI enhanced its climate risk reporting to include physical climate risk drivers specific to its asset types. Although gaps remain around performance improvement targets, external verification and assurance, and most notably its community relations activities, UGI has made great progress in its Product Governance and Emissions, Effluents and Waste disclosure, achieving 23 positive developments since the beginning of the engagement lifecycle.

Insights & Outlook

UGI's strategic review evaluated its LPG business with the prospect to sell the gas programme in the US. The review concluded, and the company has retained ownership of AmeriGas Propane. Results of the review and reprioritization of available funds deployment led UGI to replace its investment target of USD 1-1.25B in new renewables by 2025 with an updated target to complete previously announced renewable energy projects totaling ~USD 500M.

Engagement Results

47
meetings

478
emails and phone calls exchanged

8
engagements Resolved

40
Milestones achieved

59
Positive Developments

51%
of engagements with Good or Excellent Response

48%
of engagements with Standard Progress

Engagement Progress

Progress reflects the pace and scope of changes towards the engagement objective that the company is making, assessed on a five-point scale.

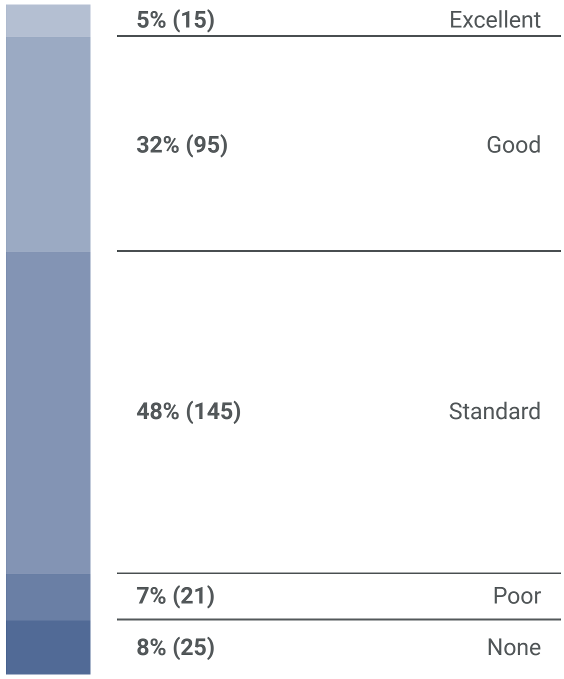
Excellent The company has adopted a proactive approach and addressed the issues related to the change objective.

Good The company has taken sufficient measures to address the issues related to the change objective.

Standard The company has undertaken a number of measures to address the issues related to the change objective.

Poor The company has indicated willingness to addressing the issues related to the change objective, but no measures have been taken yet.

None The company has not made any progress against the engagement objective.



Engagement Response

Response reflects the company's willingness to engagement diaolgue with investors, assessed on a five-point scale.

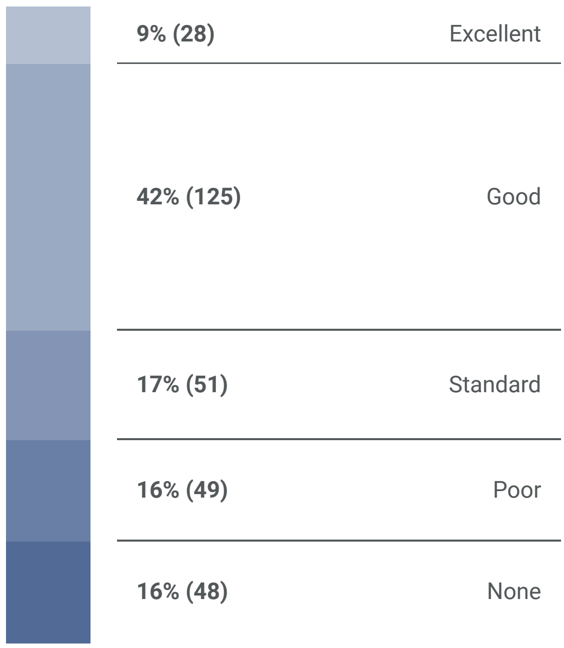
Excellent The company is proactive in communicating around the issues related to the change objective.

Good The company addresses all the issues related to the change objective.

Standard The company provides responses to some of the issues related to the change objective.

Poor The company has initially responded but not properly addressed the issues related to the change objective and is unwilling to engage further with us.

None The company has not responded to the inquiries.



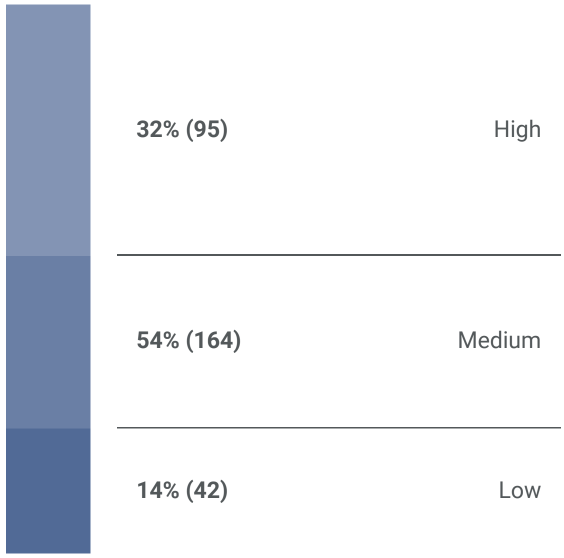
Engagement Performance

Performance describes the combined company Progress and Response.

High Good or Excellent Progress in combination with Good or Excellent Response.

Medium Standard level of Progress and Response.

Low Poor or None Progress in combination with Poor or None Response.



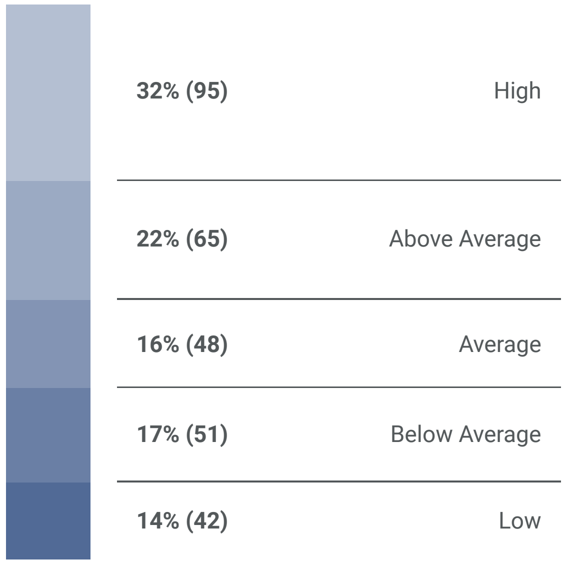
Engagement Performance Assessment Update

To provide a more granular assessment, we have expanded the tiers used to evaluate Engagement Performance. Previously, engagements assessed Performance using three tiers: Low, Medium, and High (as listed above).

Going forward, we will use five tiers to offer a more nuanced understanding. The new tiers are: Low, Below Average, Average, Above Average, and High. This change subdivides the previous Medium category into three distinct categories. In this report we have presented both three and five-tier assessments.

In the future, all reporting will use the five-tier system.

The Progress and Response matrix is used to determine Performance.



Progress and Response Matrix

RESPONSE

PROGRESS	EXCELLENT	GOOD	STANDARD	POOR	NONE
EXCELLENT	High	High	Above Average	Average	Average
GOOD	High	High	Above Average	Average	Average
STANDARD	Above Average	Above Average	Average	Below Average	Below Average
POOR	Average	Average	Below Average	Low	Low
NONE	Average	Average	Below Average	Low	Low

Engagement Milestones

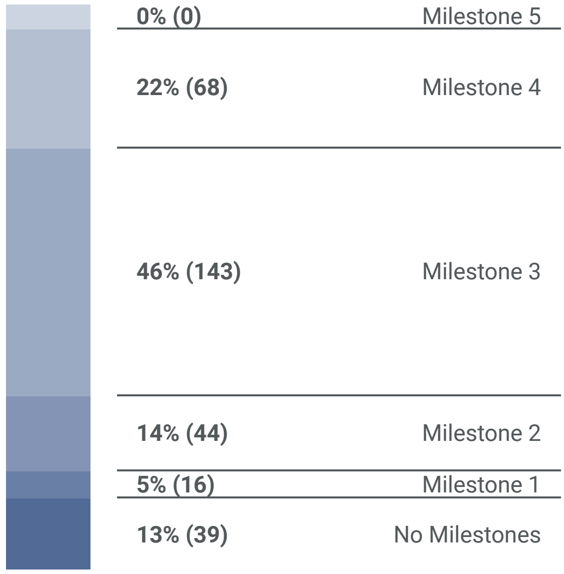
Milestones are our five-stage tracking of progress in achieving the engagement objective.

40 Milestones achieved in Q4 2024

Milestone Framework

Milestone 5	Change objective is considered fulfilled.
Milestone 4	Implementation of strategy has advanced meaningfully, and related issuer disclosure maturing.
Milestone 3	Strategy is well formed and has moved into early stages of implementation.
Milestone 2	Issuer establishes a strategy to address the issue.
Milestone 1	Acknowledge of issue(s) and commitment to mitigation.

Engagements by Highest Milestone Achieved



Engagements Resolved

COMPANY	COUNTRY	INDUSTRY	ISSUE	QUARTER
CEZ as	Czech Republic	Utilities	Focus on Occupational Health and Safety	Q4
CJ CheilJedang Corp.	South Korea	Food Products	Focus on Carbon Own Operations	Q4
Fortive Corp.	United States of America	Industrial Conglomerates	Focus on Product Governance	Q4
General Motors Co.	United States of America	Automobiles	Focus on Carbon Products and Services	Q4
K+S AG	Germany	Chemicals	Focus on Carbon and Community Relations	Q4
Nordnet AB	Sweden	Banks	Focus on Product Governance	Q4
Toyota Industries Corp.	Japan	Machinery	Focus on Carbon and E&S Impact of Products and Services	Q4
Winbond Electronics Corp.	Taiwan	Semiconductors	Focus on Resource Use	Q4

Resolved - CEZ as

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

26.8

INDUSTRY:
Utilities

COUNTRY:
Czech Republic

ENGAGEMENT FOCUS:
Data Privacy and Cybersecurity
Emissions, Effluents and Waste
Carbon – Own Operations

RATIONALE FOR RESOLVED STATUS:
CEZ as has improved its ESG Risk Rating score to below 28.

Positive Development Highlights:

- CEZ has established a robust ESG governance structure with board-level oversight and accountability, linking ESG performance metrics to executive pay.
- CEZ has set 1.5 degree-aligned carbon emissions reduction targets, verified by the Science Based Target Initiative. It published its first TCFD report in 2022 and subsequently disclosed key actions and investments in low-carbon technologies.
- CEZ implemented the Integrated Security Operations Center to oversee cybersecurity and information systems, fully integrating cybersecurity into all processes and management systems, with its nuclear plants certified to ISO 27001.

In the latest update of the ESG Risk Rating, CEZ's management score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Resolved - CJ CheilJedang Corp.

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

26.8

INDUSTRY:
Food Products

COUNTRY:
South Korea

ENGAGEMENT FOCUS:
Corporate Governance
E&S Impact of Products and Services
Product Governance

RATIONALE FOR RESOLVED STATUS:
CJ CheilJedang Corp. has improved their ESG Risk Rating score to below 28.

Positive Development Highlights:

- CJ CheilJedang Corp. disclosed qualitative or quantitative KPIs/goals to all material ESG issue.
- The company identified the product governance issue as part of the material issues.
- It conducted external product safety audits. The company obtained the Consumer Centered Management (CCM) certification in 2015 for the first time.
- CJ CheilJedang Corp. established the mid-to-long-term goals of 'Nutrition Commitment 2025' which guide the selection of categories and products that contribute to sodium, saturated fat, and sugar intake. The aim is to gradually reduce these ingredients while expanding the health-oriented product portfolio.

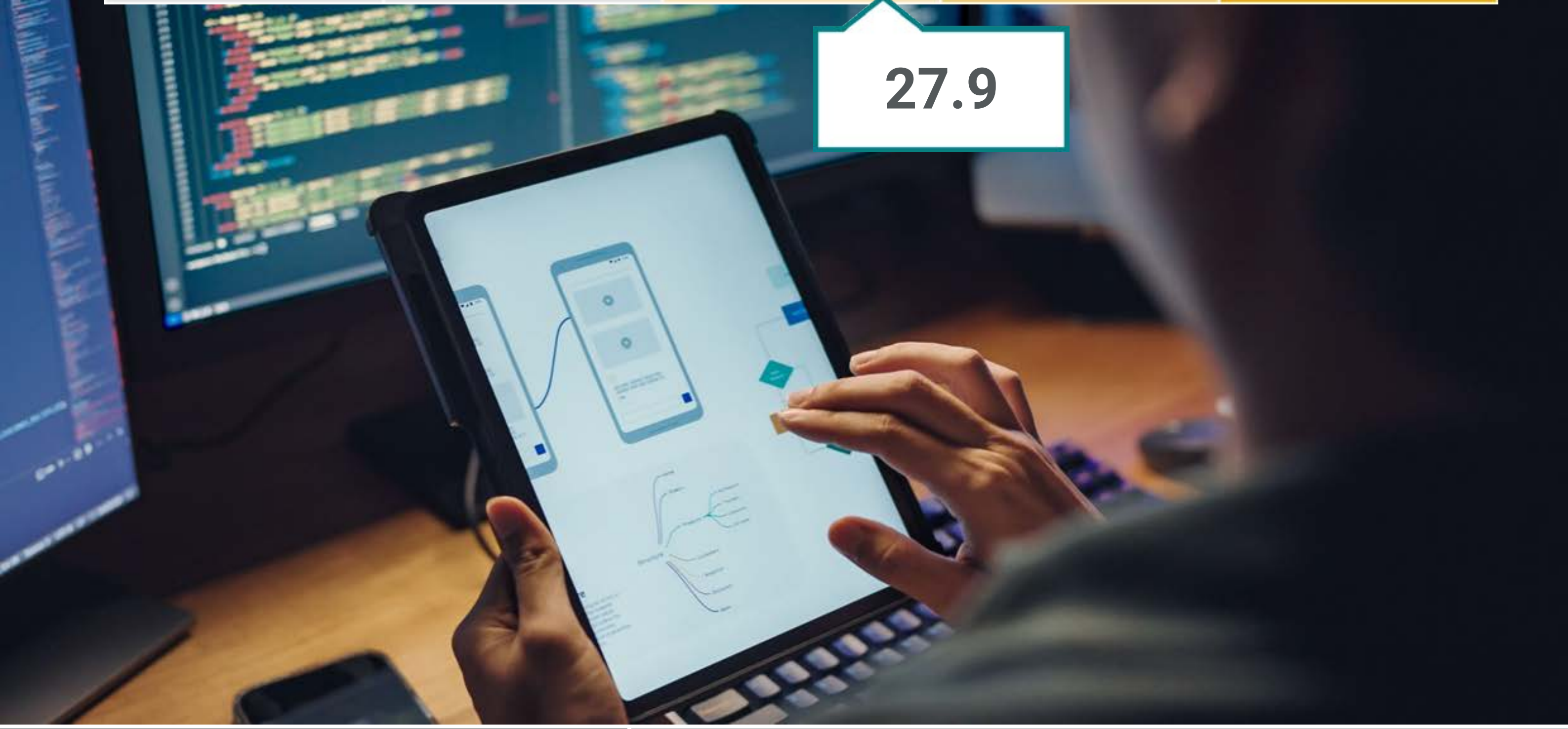
In the latest update of the ESG Risk Rating, CJ CheilJedang Corporation's management score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Resolved - Fortive Corp.

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

27.9



INDUSTRY:
Industrial Conglomerates

COUNTRY:
United States

ENGAGEMENT FOCUS:
Product Governance
E&S Impact of Products and Services
Carbon – Products and Services

RATIONALE FOR RESOLVED STATUS:
Fortive Corp. has improved their ESG Risk Rating score to below 28.

Positive Development Highlights:

- Fortive integrates ESG factors and materiality analysis into its risk assessment process using a data-driven approach. The 2023 assessment with Datamaran® software prioritizes sustainability issues based on their impact on the organization and stakeholders.
- Fortive's Risk Assessment Program ensures robust management of product quality and safety by evaluating risks such as product safety, regulatory compliance, and EHS annually. In 2023, the company assessed 200 direct marual suppliers.
- Fortive aims to reduce absolute Scope 1 and 2 GHG emissions by 50% by 2029, from 2019 levels, in line with the Science Based Targets Initiative (SBTi). Key strategies include infrastructure upgrades, renewable energy procurement, and improved data collection. In 2023, Fortive's Scope 3 GHG emissions totaled over 599k $MTCO_2e$. Additionally, Fortive plans to reduce absolute water use by 10% by 2029 and has rigorous processes for managing water and waste.

In the latest update of the ESG Risk Rating, Fortive's management score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Resolved - General Motors Co.

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

27.0

INDUSTRY:
Automobiles

COUNTRY:
United States

ENGAGEMENT FOCUS:
Carbon – Products and Services
Product Governance
Human Capital

RATIONALE FOR RESOLVED STATUS:
General Motors Co. has improved their ESG Risk Rating score to below 28.

Positive Development Highlights:

- General Motors (GM) has set science-based targets to reduce Scope 1 and 2 emissions by 72% and Scope 3 emissions by 51% per vehicle kilometer by 2035, compared to a 2018 baseline.
- The company has strengthened its product governance by integrating safety and quality standards into every stage of product development. The company continues to uphold ISO 9001 (Quality Management Systems) and ISO 14001 (Environmental Management Systems) certifications across its global operations and actively participates in developing industry safety standards.
- GM has committed to producing 100% electric light-duty vehicles by 2035.The company has already launched several electric vehicle models and continues to invest heavily in EV technology and infrastructure.

In the latest update of the ESG Risk Rating, GM's Risk Rating score has improved, bringing it into the medium risk category and below our 28-point threshold for engagement.

Resolved - K+S AG

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

26.9

INDUSTRY:
Chemicals

COUNTRY:
Germany

ENGAGEMENT FOCUS:
Carbon – Own Operations
Corporate Governance
Emissions, Effluents and Waste

RATIONALE FOR RESOLVED STATUS:
K+S AG has improved its ESG Risk Rating score to below 28.

Positive Development Highlights:

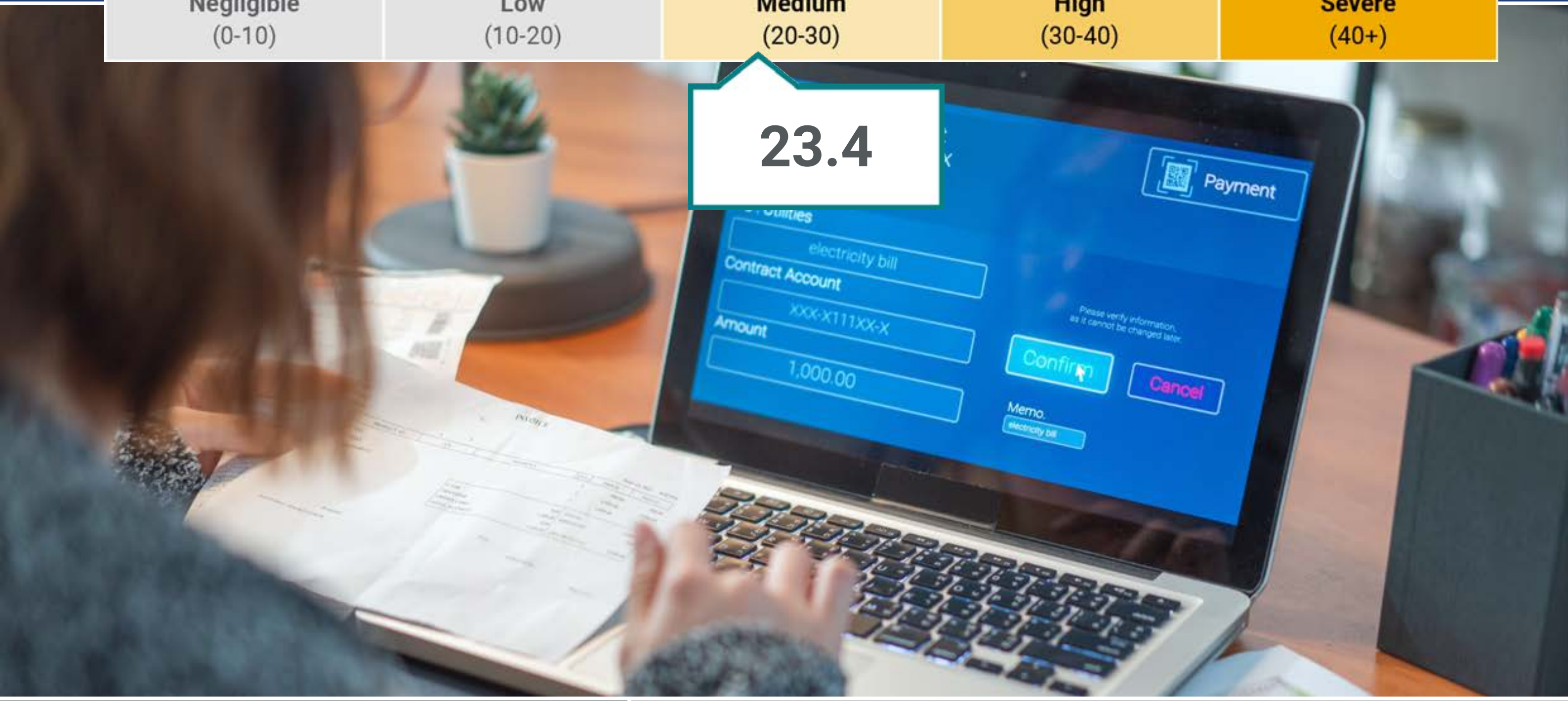
- K+S linked its ESG performance metrics to executive pay in 2023, introducing three new sustainability goals with equal weight in the Long-Term Incentive Plan for the Board of Executive Directors.
- K+S updated and increased the ambition of its interim 2030 and 2040 emissions reduction targets, aiming for climate neutrality by 2045 in alignment with Germany's net zero commitment. The company provided reasonable insights into its net zero strategy, reduction trajectory, and key decarbonization levers.
- K+S published a Negative Declaration Hazardous Waste document in 2024, outlining its waste management approach and monitoring via environmental data management software.

In the latest update of the ESG Risk Rating, K+S's risk score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Resolved - Nordnet AB

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)
		23.4		



INDUSTRY:
Banks

COUNTRY:
Sweden

ENGAGEMENT FOCUS:
Product Governance
Data Privacy and Cybersecurity
Corporate Governance
Business Ethics

RATIONALE FOR RESOLVED STATUS:
Nordnet AB has improved its ESG Risk Rating score to below 28.

Positive Development Highlights:

- Nordnet established a clear governance structure for its sustainability function, with oversight conducted by the Board. It detailed how the sustainability department, the Board, and Board-level committees interact on ESG topics.
- The company disclosed risks, governing policies, management systems, initiatives, and performance metrics for all material ESG issues.
- It implemented a customer complaint mechanism, enabling users to report issues and trigger corrective actions. This channel was made accessible in all local languages where Nordnet operates, ensuring ease of use for customers.
- Nordnet published a stand-alone Data Privacy Policy, outlining its commitment to upholding data protection standards, implementing robust security safeguards, addressing data privacy concerns, and ensuring data subjects' rights to access, correct, and erase their personal information. It also disclosed details about its cybersecurity programme.

In the latest update of the ESG Risk Rating, Nordnet's management score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Resolved - Toyota Industries Corp.

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

28.0

INDUSTRY:
Machinery

COUNTRY:
Japan

ENGAGEMENT FOCUS:
Corporate Governance
Carbon – Products and Services
Human Capital
E&S Impact of Products and Services

RATIONALE FOR RESOLVED STATUS:
Toyota Industries Corp. has improved their ESG Risk Rating score to 28.

Positive Development Highlights:

- Toyota Industries Corp. obtained Science Based Targets certification in 2024. The company commits to reduce absolute Scope 1 and 2 GHG emissions 42% by FY2031 from FY2022 base year and to reduce absolute Scope 3 GHG emissions from use of sold products 30% by FY2031 from FY2019 base year.
- The company appointed one female executive officer in 2022 and one female director in 2024, where there were no women in the Board and executive officers before then.
- In June 2024, the percentage of independent directors on the Board increased from 33% to 43%, exceeding the market standard set by Japan's Corporate Governance Code, which requires at least one-third independent directors for Prime Market-listed companies.
- Toyota Industries Corp. formulated and disclosed the Group Anti-Bribery Policy.

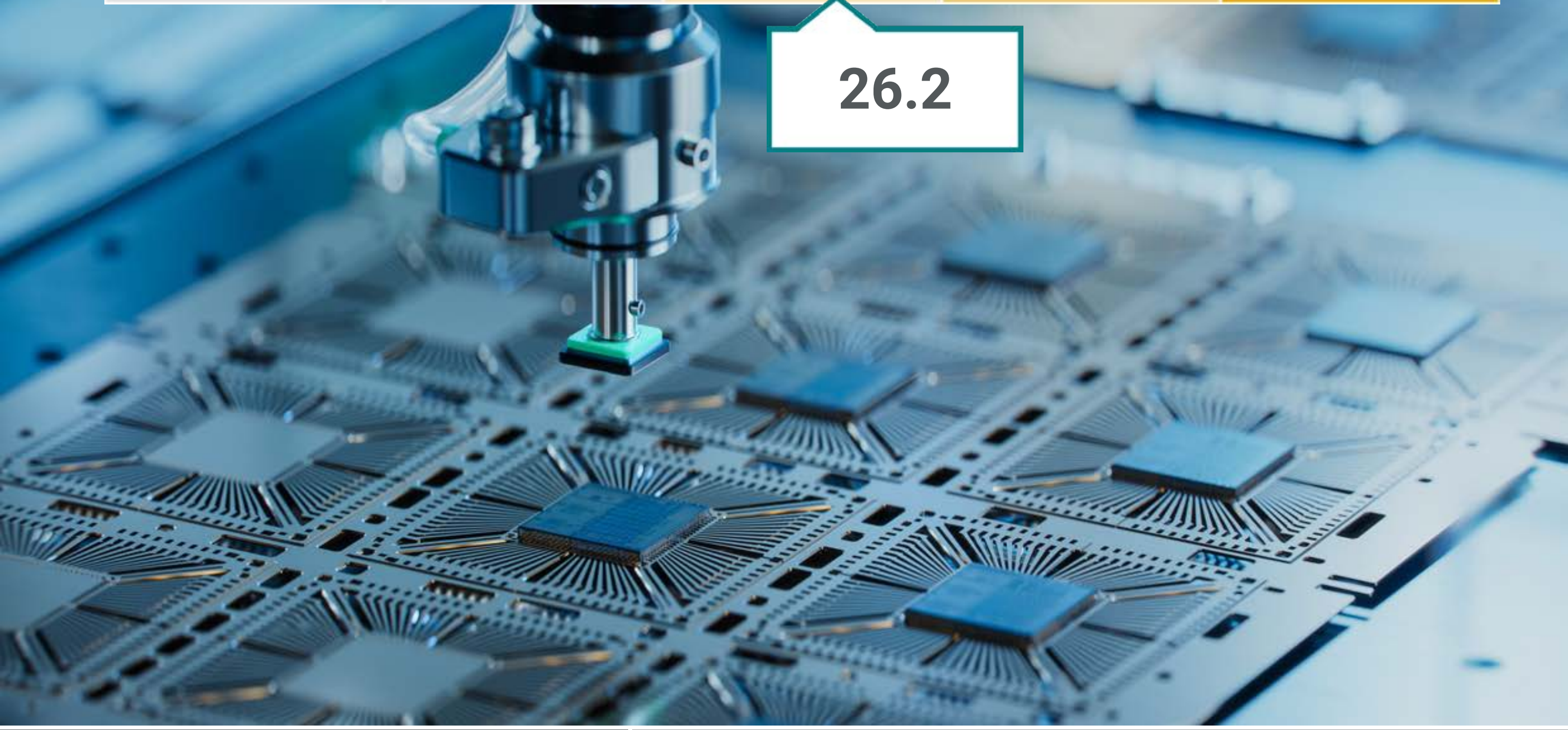
In the latest update of the ESG Risk Rating, Toyota Industries Corporation's management score improved, bringing the company into the medium risk category and to the 28-point threshold for engagement.

Resolved - Winbond Electronics Corp.

ESG Risk Ratings Score

Negligible (0-10)	Low (10-20)	Medium (20-30)	High (30-40)	Severe (40+)

26.2



INDUSTRY:
Semiconductors

COUNTRY:
Taiwan

ENGAGEMENT FOCUS:
Resource Use
Carbon – Own Operations
ESG Governance

RATIONALE FOR RESOLVED STATUS:
Winbond Electronics Corp. as has improved its ESG Risk Rating score to below 28.

Positive Development Highlights:

- Winbond Electronics developed carbon emissions information platform, related to Scope 3 monitoring which is 89 per cent of Winbond's emissions.
- The company became ISO 46001 water certified by April 2023 for its treatment, processing, and utilization of water which is a critical feature of the semiconductor industry for the cleanings of the wafers and the cooling.
- Waste recycling rate has surpassed 90 per cent (90.1) with 8,633 metric tons of waste recycled. This calculation is now being monitored.

In the latest update of the ESG Risk Rating Winbond Electronics Corp.'s management score improved, bringing the company into the medium risk category and below the 28-point threshold for engagement.

Winter Wonderland: Unique Climate Risks in the Great Lakes Region of North America

Shane Tiley
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Material Risk/Strategy & Risk Engagement
Morningstar Sustainalytics

This article provides a comprehensive overview of the physical and financial impacts of climate change-induced snowfall in North America's Great Lakes region, offering valuable insights for investors concerned about the potential impacts on corporate assets and business operations. By highlighting the unique aspects of the Great Lakes region, focusing on the implications of increasing extreme snowfall events, the article underscores the importance of proactive risk management and investment in resilience.

Climate change is reshaping weather patterns globally, and North America's Great Lakes region is experiencing unique challenges. Over the last weekend of November 2024, the Great Lakes region experienced an extreme snowfall event. Local towns declared a state of emergency after being hit with ~140 cm of snow, leading to prolonged highway closures and widespread power outages affecting more than 60,000 people.[1] Snow squalls, driven by cold air over the Great Lakes, created hazardous travel conditions and stranded many vehicles.[2] Emergency services worked tirelessly to assist those affected, and residents were advised to stay home due to the dangerous road conditions.

The Great Lakes Region: A Climate Change Hotspot

The Great Lakes region, encompassing parts of both the United States and Canada, is home to the largest freshwater system on Earth, containing 84% of North America's fresh surface water.[3] This region includes agricultural lands, forests, urban areas, and diverse shorelines—all of which are integral to the local economy and environment. The Great Lakes themselves play a crucial role in moderating regional climate conditions, influencing temperature, precipitation, and weather patterns.[4] However, climate change is already taking a significant toll on the region. Increased precipitation and extreme weather events are causing flooding, erosion, and declining water quality. These changes are impacting agriculture, infrastructure, natural resources, and public health, making the region particularly vulnerable to climate variability and change.[5]

A Paradox of Climate Change

Paradoxically, climate change is leading to increased heavy snowfall in the Great Lakes region. Warmer global temperatures result in less ice cover on the Great Lakes, allowing more moisture to evaporate into the atmosphere. When cold air masses move over the relatively warm lake waters, this moisture is picked up and transformed into significant lake-effect snow. Consequently, areas downwind of the lakes, particularly in northern regions, are experiencing more frequent and intense snowfall events.[6] This phenomenon highlights the complex and sometimes counterintuitive impacts of climate change on local weather patterns.

The number of days with snow cover has generally decreased across most of Canada due to later snow onset in the fall and earlier snow melt in the spring—however, there are regional variations. Areas downwind of the Great Lakes have experienced increases in snowfall due to lake-effect snow.[7,8] Future projections indicate that while overall snow cover may decrease, heavy snowfall events could become more frequent in certain regions due to changing weather patterns.[9]

Financial Impacts of Extreme Snowfall Events

The Great Lakes region has a long history of extreme snowfall events that have had significant financial impacts affecting both public infrastructure and private properties. For instance, the November 2022 lake-effect snowstorm in Buffalo, New York, resulted in over 80 inches of snow over four days, causing widespread power outages, structural damage to buildings, and major disruptions to transportation networks.[10] These events lead to increased costs for snow removal, road maintenance, and emergency services, as well as higher insurance claims due to property damage.

The Insurance Bureau of Canada (IBC) has reported a significant increase in insurance claims related to severe weather, including snow and ice damage. According to the IBC, insured damage from severe weather events in Canada now routinely exceeds USD 2 billion annually, with a substantial portion attributed to water-related damage, which includes snow and ice.[11,12] Additionally, businesses face operational disruptions, with supply chains being particularly vulnerable to delays and increased costs.

Overall, the financial impacts of extreme snowfall events in the Great Lakes region are escalating, reflecting broader trends of increasing extreme weather events linked to climate change. These trends underscore the growing financial impact of extreme snowfall events, and the importance for investors and companies to incorporate climate risk assessments and resilience planning into their strategies to mitigate potential losses.

Implications for Investors

The rising costs associated with snow removal, infrastructure repair, and insurance premiums can significantly affect the bottom line. Moreover, disruptions in operations and supply chains can lead to lost revenue and increased operational costs. Corporate asset owners and investors should consider the following strategies to mitigate risks and capitalize on opportunities:

1. **Risk Assessment and Management:** Conduct thorough risk assessments to identify vulnerabilities in business operations and supply chains. Implement robust risk management strategies to minimize potential disruptions and financial losses.
2. **Infrastructure Investment:** Invest in resilient infrastructure that can withstand extreme weather events. This includes upgrading buildings, transportation networks, and energy systems to enhance their durability and reliability.
3. **Insurance and Financial Planning:** Review and adjust insurance coverage to ensure adequate protection against extreme weather events. Consider financial planning strategies that account for potential increases in insurance premiums and other climate-related costs.
4. **Sustainable Practices:** Promote and invest in sustainable business practices that reduce greenhouse gas emissions and mitigate climate change. This can include energy efficiency measures, renewable energy investments, and sustainable supply chain management.
5. **Engagement and Advocacy:** Engage with policymakers and industry stakeholders to advocate for climate action and resilience-building measures. Support initiatives that promote sustainable development and climate adaptation.

Climate change is reshaping snowfall patterns in North America, with significant financial implications for corporate assets and critical infrastructure. The increasing frequency and severity of extreme snowfall events underscore the need for proactive risk management and investment in resilient infrastructure. By understanding and addressing these challenges, investors can protect their assets and capitalize on opportunities in a changing climate. As the impacts of climate change continue to unfold, staying informed and prepared will be key to navigating the evolving landscape of risks and opportunities.

Spotlight on Accelerating the EU Energy Transition

European Investor Trip in November 2024

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The energy transition in the European Union (EU) is at a pivotal point, grappling with the aftermath of the energy crisis exacerbated by the Russia—Ukraine war, with European energy security being more urgent than ever. To execute its ambitious Green Deal and bolster the European green economy, the EU has adopted ambitious legislation, including the Fit for 55 package, Renewable Energy Directive (RED III), and REPowerEU plan. Yet, 2024 has been something of a reality check, exposing significant hurdles such as infrastructure bottlenecks, investment shortfalls in clean energy technologies, high electricity prices, and the delicate balance of integrating decentralized energy systems with grid stability. Adding to these challenges, the forthcoming Carbon Border Adjustment Mechanism (CBAM) is set to further reshape EU trade dynamics and intensify pressure on high-emitting industries already struggling to meet short-term carbon reduction goals.

Amid these headwinds, European companies are working to decarbonize and raise capital to fund their low-carbon transitions. In 2024, there were numerous media reports of companies scaling back or delaying interim carbon reduction targets due to persistently high interest rates, elevated raw material costs, supply chain disruptions, project delays, and low demand for green products. Moreover, China's dominance in critical low-carbon and renewable technology supply chains has heightened Europe's exposure to vulnerabilities in manufacturing capacity and industrial policy gaps. In November 2024, the EU's lighthouse project Northolt filed for bankruptcy delivering a blow to Europe's EV battery ambitions and intensifying concerns about the financial stability of key projects and the region's competitiveness.

European Investor Trip

To understand how companies are navigating these complexities, we set out into the field in November 2024 to witness firsthand how European industry leaders are driving the energy transition. Material Risk Engagement Manager Marta Mancheva and Net Zero Transition Engagement Lead Amar Causevic conducted site visits and corporate meetings with stakeholders ranging from senior management to engineers and plant operators. The trip spanned Germany, France, and Spain, covering key sectors such as utilities, chemicals, steel, industrial gases, and construction. Central to the discussions were topics such as the economics and use cases of green hydrogen, industrial electrification, large-scale green ammonia generation, solar park innovations, decarbonizing feedstocks, and the demand for low-carbon products.

Highlights from the trip included:

- Witnessing BASF's pioneering e-furnace technology in the steam cracker process at the world's largest integrated chemical park in Ludwigshafen, Germany.
- Learning how Iberdrola deployed an industry-scale green hydrogen plant for green ammonia production by Grupo Fertiberia in Puertollano, Spain.
- Gaining insights from Spanish steel company Acerinox on decarbonizing stainless steel and high-performance alloys across geographies.
- Exploring how Air Liquide is deploying its innovative CCS Cryocap™ technology.
- Engaging with Bouygues to learn about its expanding portfolio of green products and services.

Reflecting on the trip, a few take-aways stood out: companies face significant challenges in scaling commercially viable low-carbon technologies. European subsidies and funding mechanisms have largely focused on the supply side, yet demand remains weak. Both industrial and retail customers are highly cost-sensitive, with limited willingness to pay a green premium under current market conditions. Despite ambitious EU targets and national hydrogen strategies, many green hydrogen projects stall before reaching final investment decisions due to insufficient off-taker commitments.

Nonetheless, the companies we engaged with remain firmly committed to achieving net-zero goals and while headwinds persist, these corporates are far from standing still. They are actively preparing, piloting, and engaging with policymakers to secure strategic positions in critical European low-carbon value chains as markets mature.

For more insights into the role of green hydrogen as a low-carbon technology in Europe, explore the conversation between Morningstar editor Johanna Englundh and engagement managers Marta Mancheva and Amar Causevic on Morningstar website.[13]

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About Morningstar Sustainalytics and Contacts

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