

Assessing ESG Risks Across Types of Business

March 23, 2021

Today's Speakers



Dr. Olga Loiseau-Aslanidi
Head of Business Analytics
Olga.Loiseau-Aslanidi@moodys.com



Keeran Gwilliam-Beeharee
Executive Director – Market Access
keeran.gwilliam-beeharee@vigeo-eiris.com



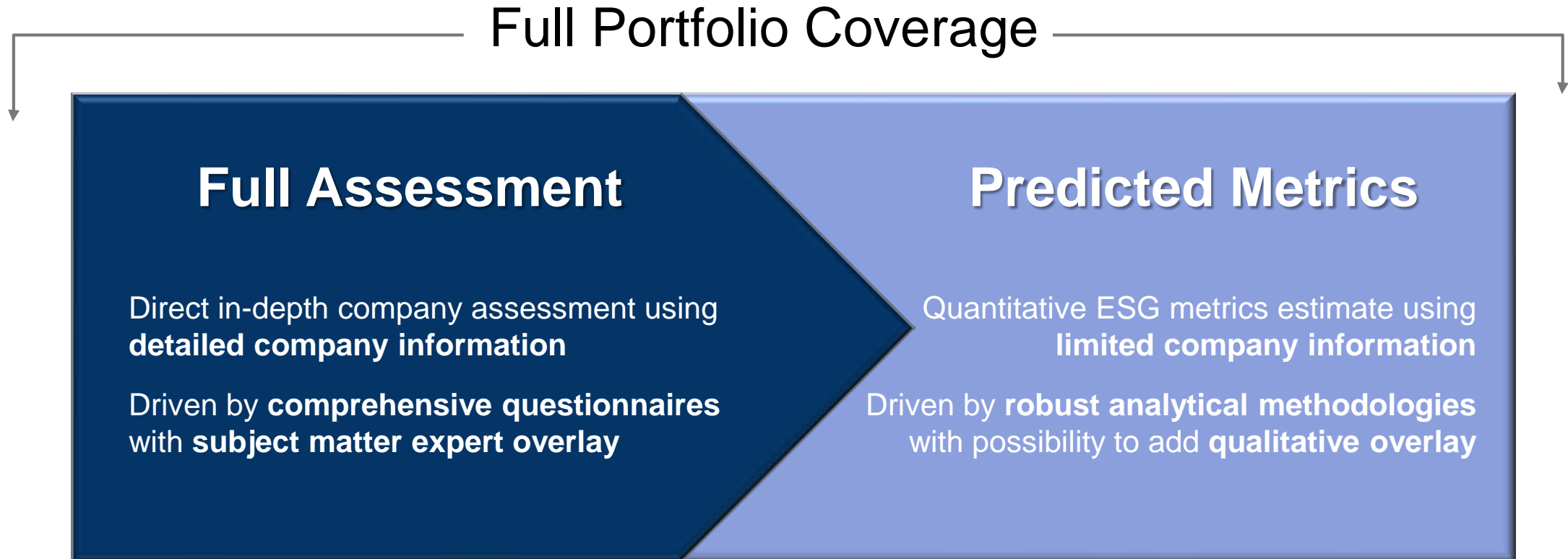
Brenda Solis Gonzalez
Senior Risk Modeller and Data Scientist
Brenda.Solis@moodys.com

Agenda

1. ESG & Climate Risk Assessment
2. Addressing ESG & Climate Risk Data Gaps
3. Illustrative Portfolio Analysis

Levels of ESG and Climate Risk Assessment

How to bridge the disclosure data gaps



1

ESG & Climate Risk Assessment

Vigeo Eiris ESG & Climate Data

Leveraging on VE data for carbon footprint & more at multiple levels of granularity



ESG Assessment Scores

- » An assessment of how companies are managing their ESG risks and opportunities.
- » Multiple layers of granular scoring
- » 0 – 100 scoring scale



Energy Transition Scores

- » An assessment of how companies are tackling the risks and opportunities tied to the transition to a low carbon economy
- » 0 - 100 scoring scale



Physical Risk Management Scores

- » An assessment of how companies anticipate, prevent and manage the **physical risks** of climate change
- » 0-100 scoring scale

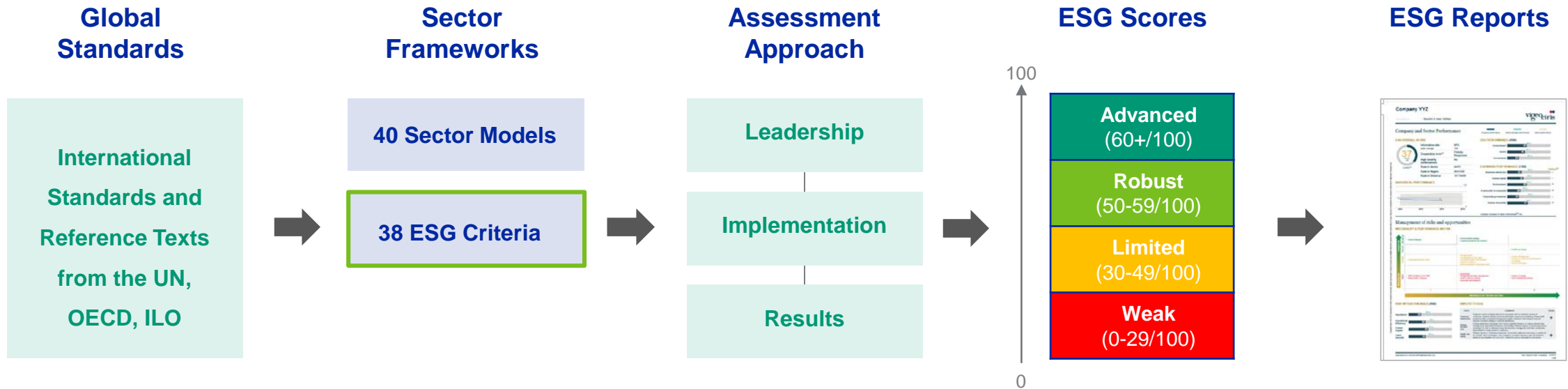


Carbon Emissions Data

- » Scope 1 data (direct)
- » Scope 2 data (indirect)
- » Scope 3 data (other indirect)
- » + modelled data

ESG Scoring - High Level Methodology

A systematic view on three angles of corporate management of ESG risks



ESG assessment methodology built around international standards and reference texts.



ESG Scoring – Criteria

ESG CRITERIA

Environmental Domain

Environmental Strategy

Pollution Prevention and Control

Green Products and Services

Biodiversity

Water

Energy

Atmospheric emissions

Waste management

Local Pollution (noise/vibration)

Transportation

Impacts of Product Use and Disposal

Business Behaviour Domain

Product Safety

Information to Customers

Customer Relations

Sustainable Supplier Relationships

Environmental Standards in the Supply Chain

Social Standards in the Supply Chain

Corruption

Anti-Competition

Lobbying

Human Resources Domain

Social Dialogue

Employee Participation

Reorganisations

Career Development

Remuneration Systems

Health and Safety

Working Hours

Human Rights Domain

Fundamental Human Rights

Fundamental Labour Rights

Non Discrimination and Diversity

Child and Forced Labour

Corporate Governance Domain

Board of Directors

Audit and Internal Controls

Shareholders

Executive Remuneration

Community Involvement Domain

Social and Economic Development

Societal Impact of Products and Services

Philanthropy

ESG Scoring - Criteria Scoring

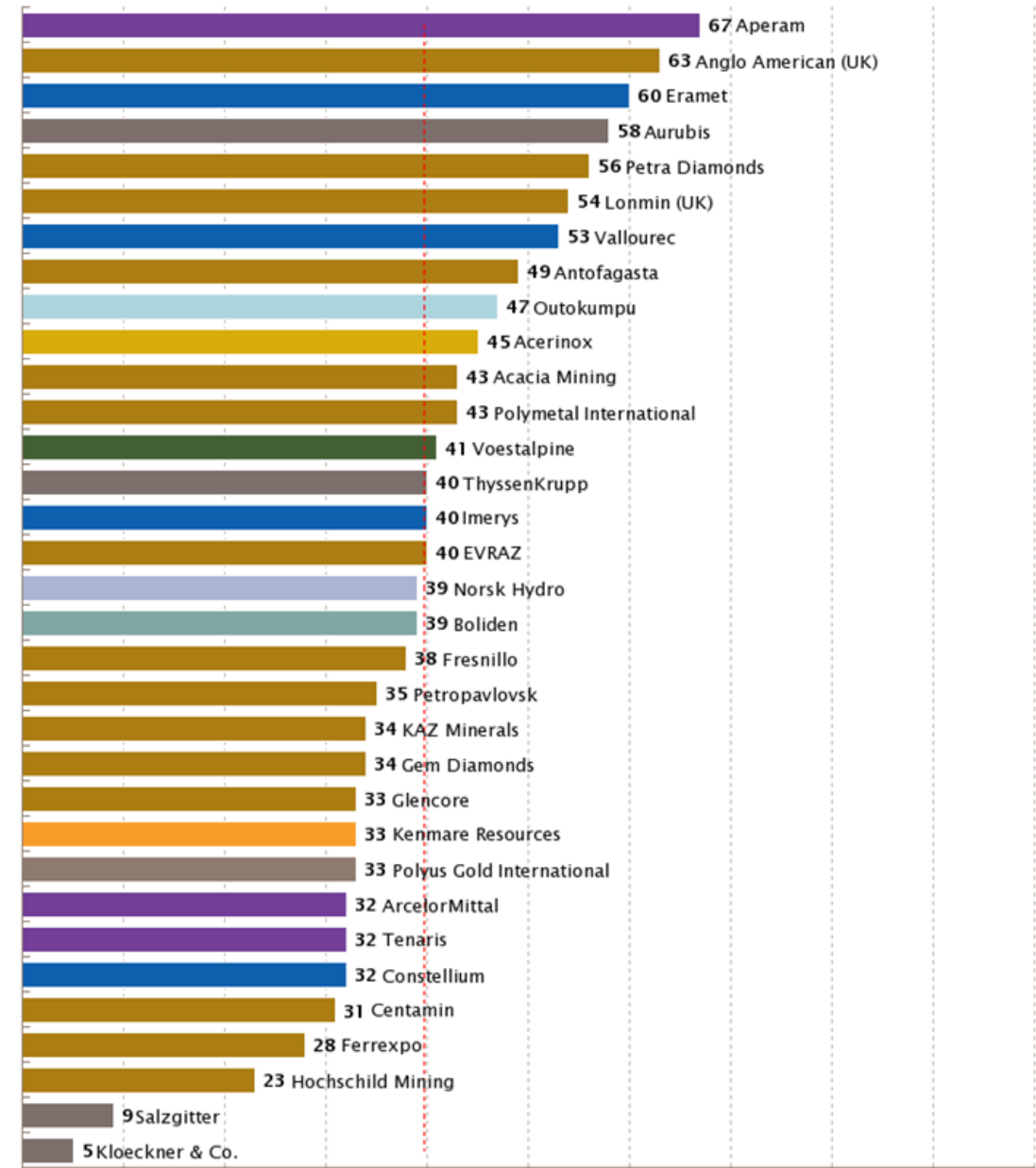
A systematic view on three angles of corporate management



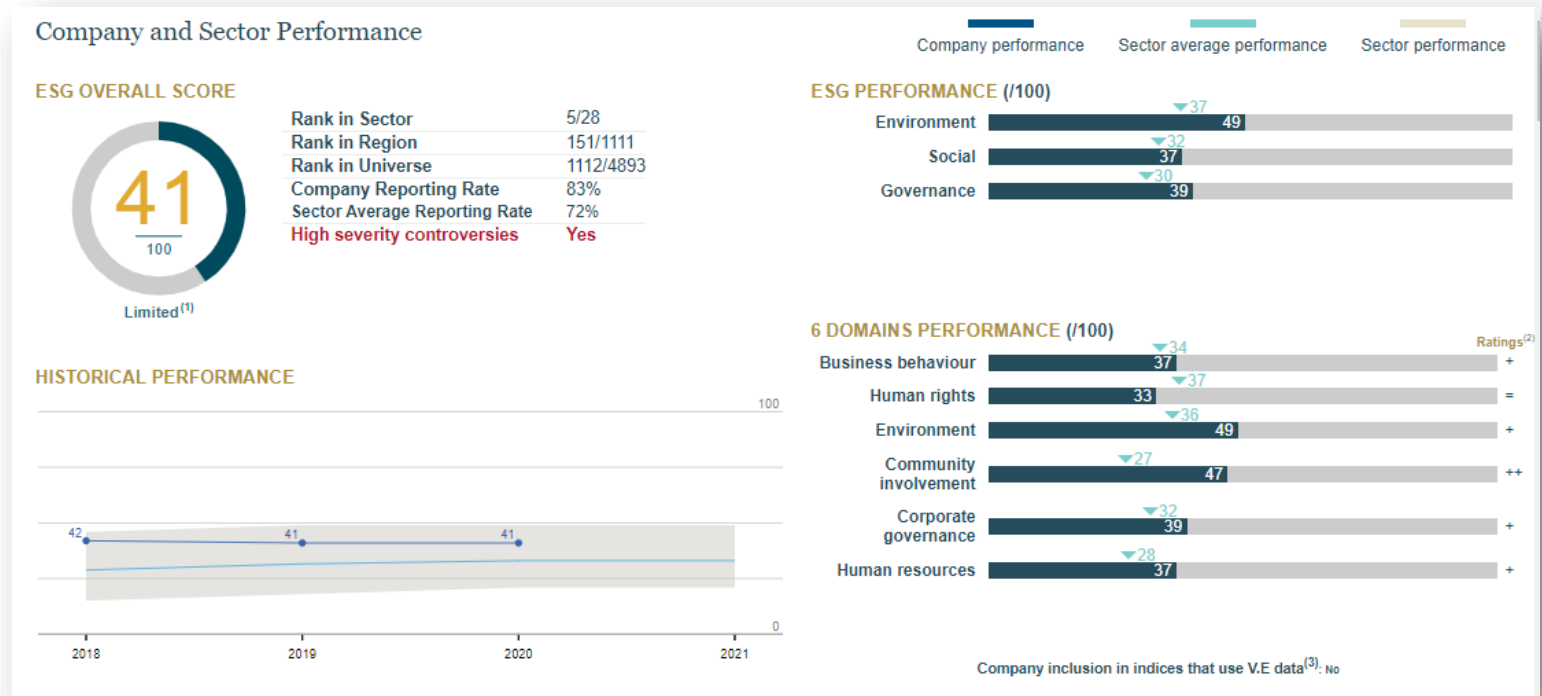
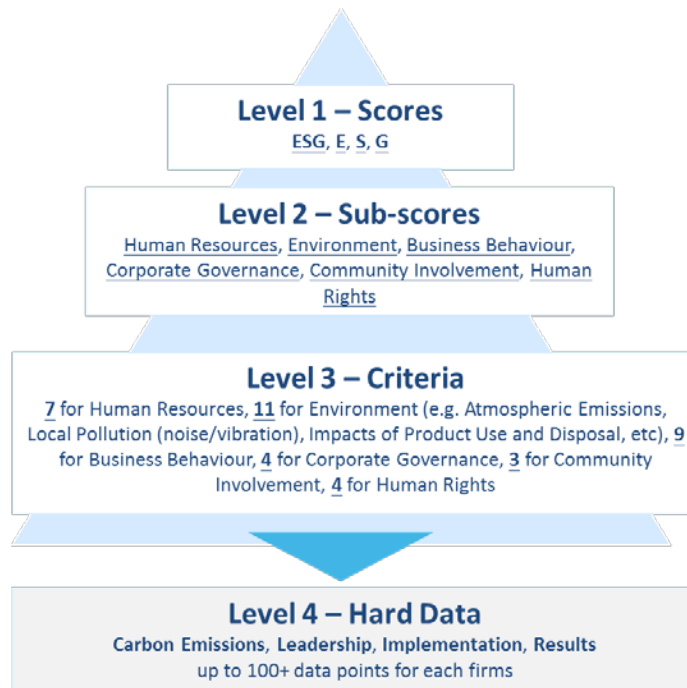
ESG Scoring – Case Study

Water Management Scores – Mining & Metals Europe

	Salzgitter	Vallourec
Water Score	9/100 [weak]	53/100 [robust]
Leadership	<ul style="list-style-type: none"> No public commitment on water consumption No public commitment on water emissions 	<ul style="list-style-type: none"> General commitment on water consumption General commitment on water emissions
Implementation	<ul style="list-style-type: none"> No information on systems put in place to manage water 	<ul style="list-style-type: none"> Information on process optimisations (rain water collection, pre-treatment facilities, water reuse technologies etc)
Results	<ul style="list-style-type: none"> Partial scope KPI reporting: Positive trend water consumption No controversies 	<ul style="list-style-type: none"> Full scope KPI reporting: Positive trend water consumption KPIs on Suspended Solids, Heavy Metals, all trending positive. No controversies



ESG Scoring – Multiple Layers of Data

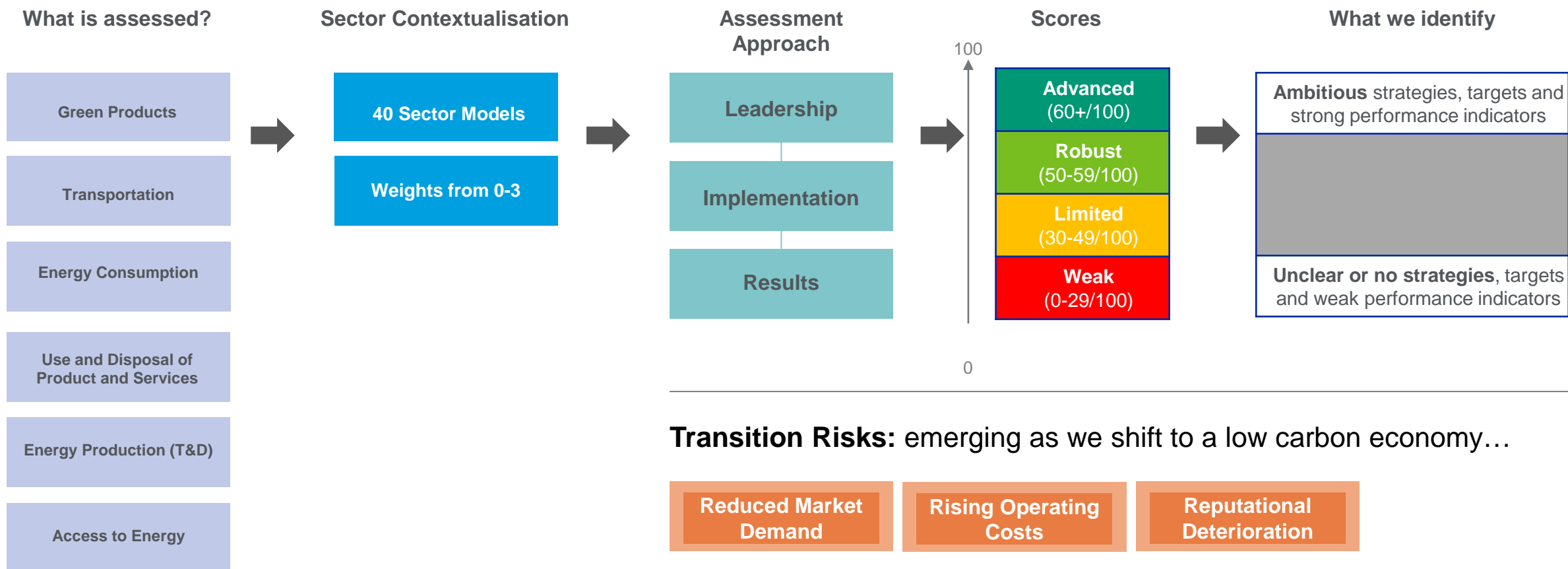


The ESG Assessment provides multiple levels of data alongside scorecards at company level.



Energy Transition Assessments

An assessment of how companies are tackling the **risks** and **opportunities** tied to the transition to a low carbon economy



Case Study Energy Transition Assessments

Tracking and understanding improvement over time

Title	2013	2015	2017	2019
Grupo Iberdrola	Robust	Advanced	Advanced	Advanced
Enel	Advanced	Advanced	Advanced	Advanced
EDF	Advanced	Advanced	Advanced	Advanced
E.ON	Limited	Limited	Advanced	Advanced
Engie	Robust	Limited	Advanced	Advanced
SSE	Limited	Robust	Robust	Robust
Naturgy Energy Group	Limited	Robust	Robust	Robust
RWE	Limited	Limited	Limited	Limited
Centrica	Limited	Limited	Limited	Limited
EnBW	Limited	Limited	Limited	Limited

Source: V.E Energy Transition Assessment Database

E.ON - (zoom on renewables strategy)

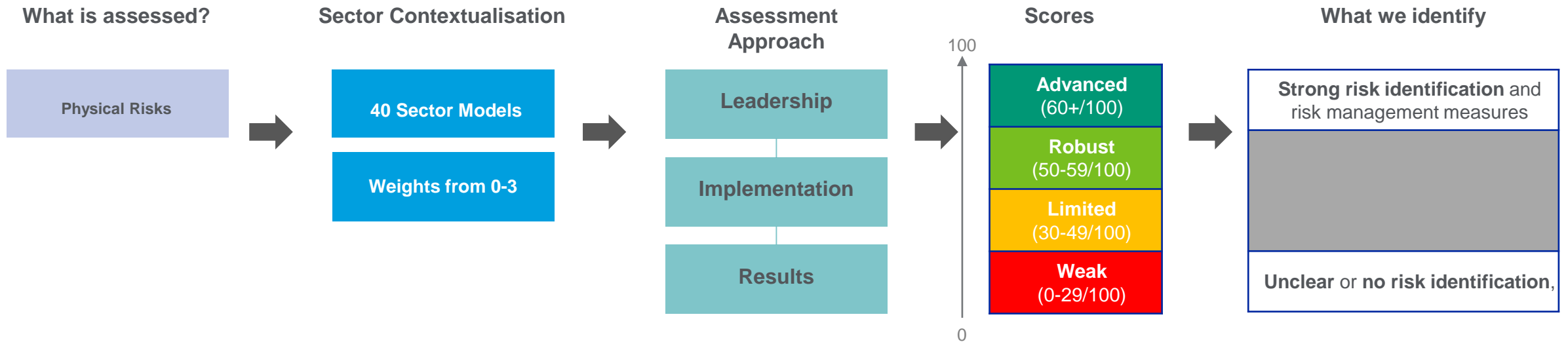
- ✓ Public commitments to develop renewables (Carbon neutral by 2040)
- ✓ Current installed renewable capacity disclosed **and** above sector average
- ✓ Ongoing renewable projects disclosed (wind/solar/biomass)
- ✓ Current renewable energy generation disclosed **and** in line with sector average.

Centrica - (zoom on renewables strategy)

- ✓ Public commitments to develop renewables (general commitment)
- ✓ Current installed capacity in renewable sources - **not disclosed**
- ✓ Ongoing renewables development projects - **not disclosed**
- ✓ Current renewable energy generation - **not disclosed**

Physical Risk Management Assessments

An assessment of how companies anticipate, prevent and manage the **physical risks** of climate change

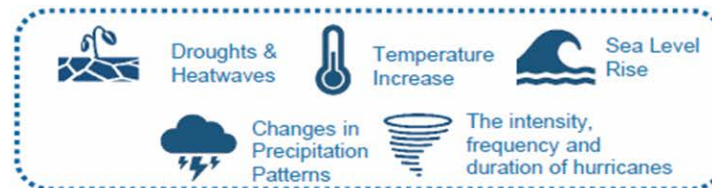


Physical Risk Impacts:

- ✓ Corporate assets
- ✓ Costs
- ✓ Impact on corporate ability to conduct activities and operations
- ✓ Supply Chain



Climate Change Impact on the company



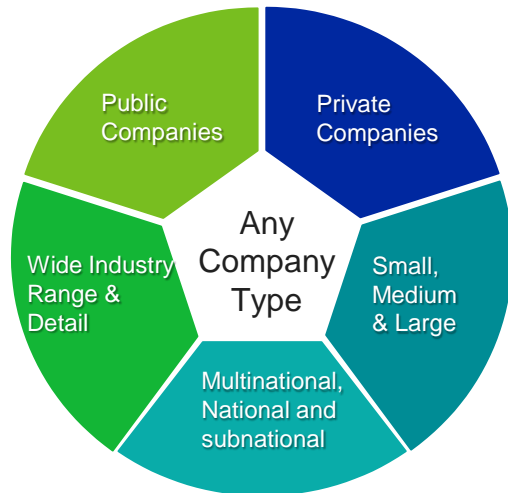
2

Addressing
ESG & Climate Risk
Data Gaps

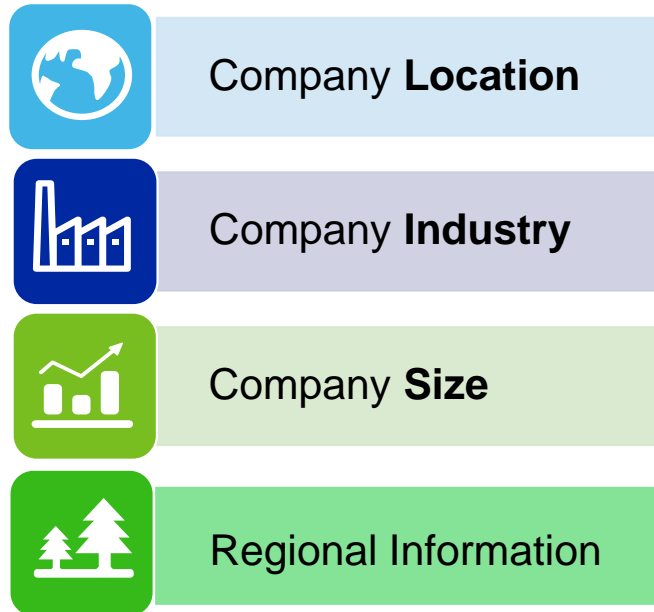
Bridging the ESG & Climate Risk Data Gaps

Applying ESG Score Predictor analytical models

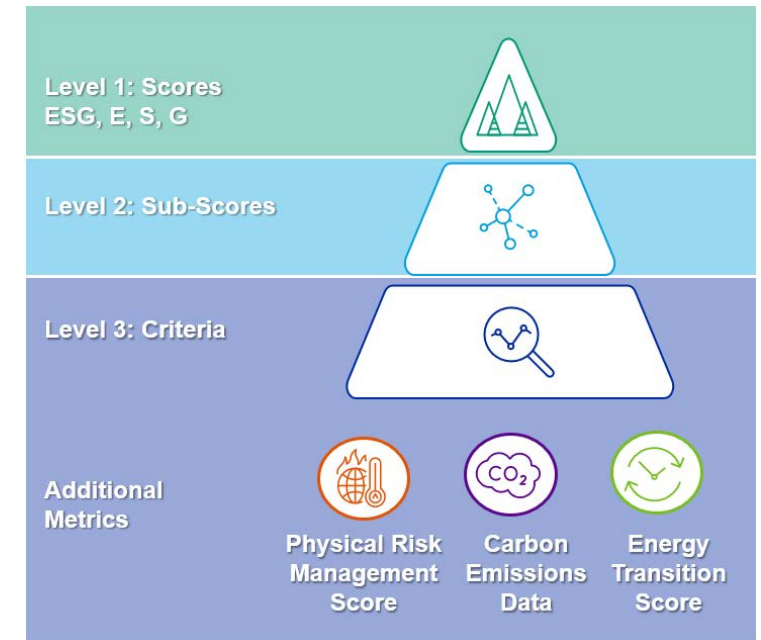
1 Portfolio



2 Analytics



3 Metrics Estimates



Leading Features to Estimate Metrics

Using Machine Learning techniques to train the models



Company Size, Location, Industry

- Total assets
- Number of employees
- Turnover, revenues
- Country, region
- Industry classification, NACE 1-4



Physical Risk

- Hurricanes and typhoons risk
- Heat and water stress
- Sea rise and floods
- Extreme precipitations
- Historical exposure to natural catastrophes



Development and Freedom Indicators

- Life expectancy, income index
- Expected years of schooling
- Political rights, civil liberty, electoral process score
- Overall freedom index, corruption perception

Macroeconomic Indicators

- GDP, industrial production
- Population
- Unemployment
- Indebtedness
- Foreign direct investments



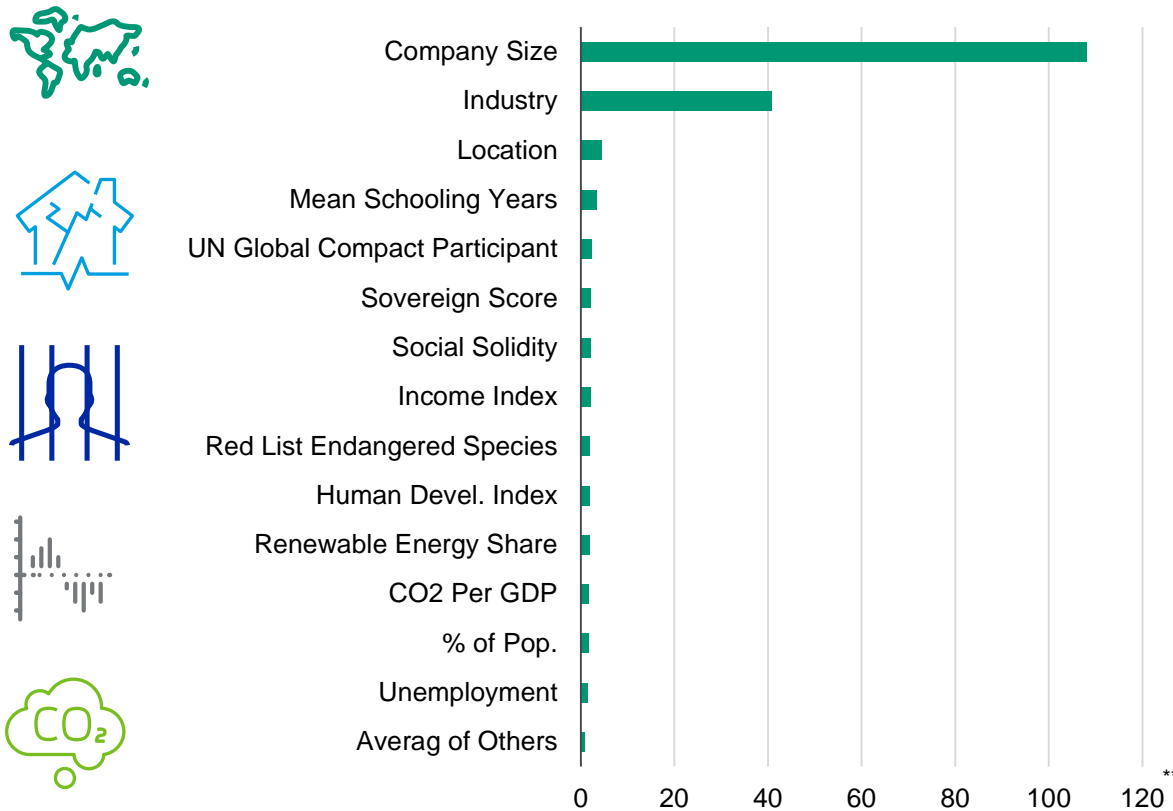
Sustainability Indicators

- CO2 emissions per GDP
- Used material within economy
- Share of population living in extreme poverty
- Income share of richest
- Sustainability commitment

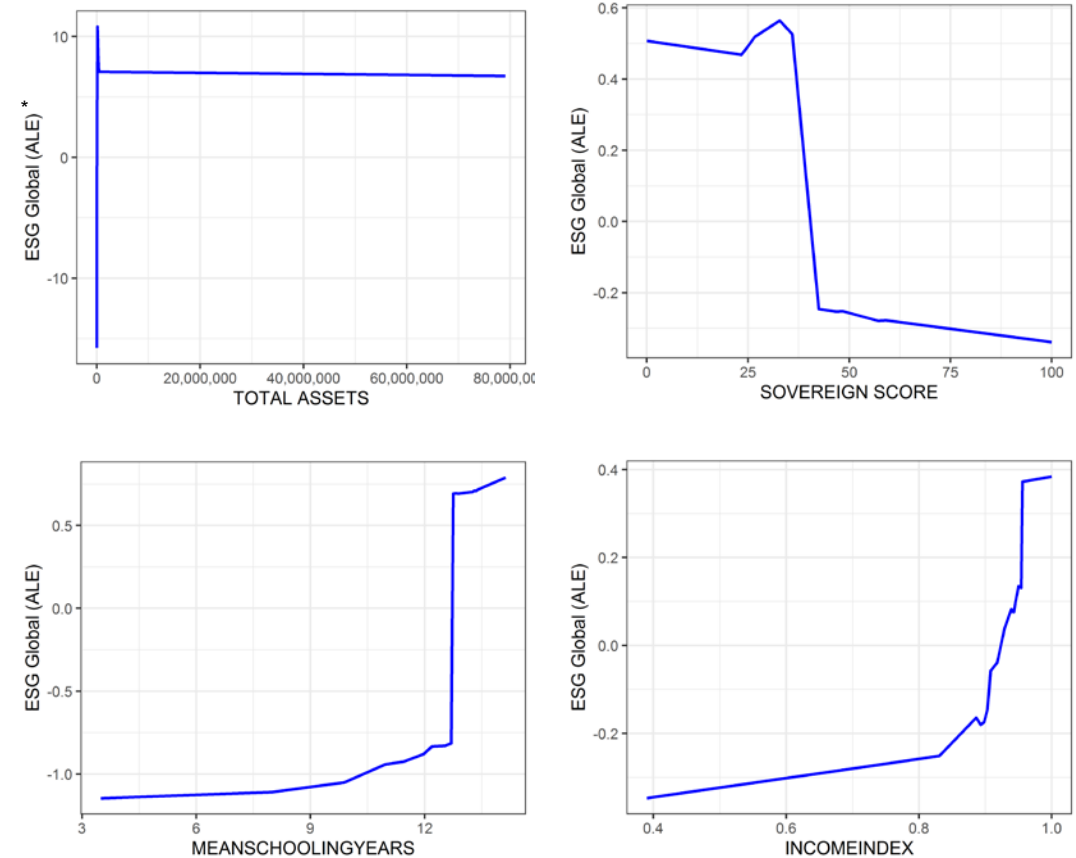


ESG Score Example: Interpreting the Metric

Illustration of importance and impact direction for top model features

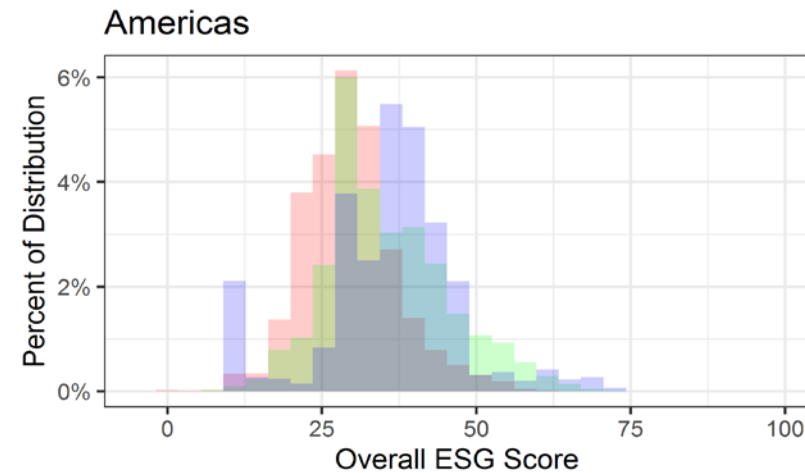
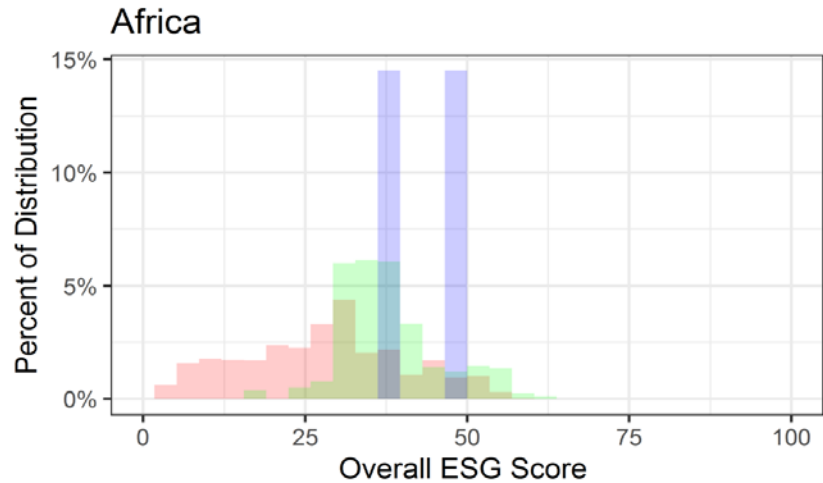


** Contribution measure for feature importance



*Accumulated Local Effect (ALE) measure for impact direction

ESG Score Example: Heterogeneity by Region

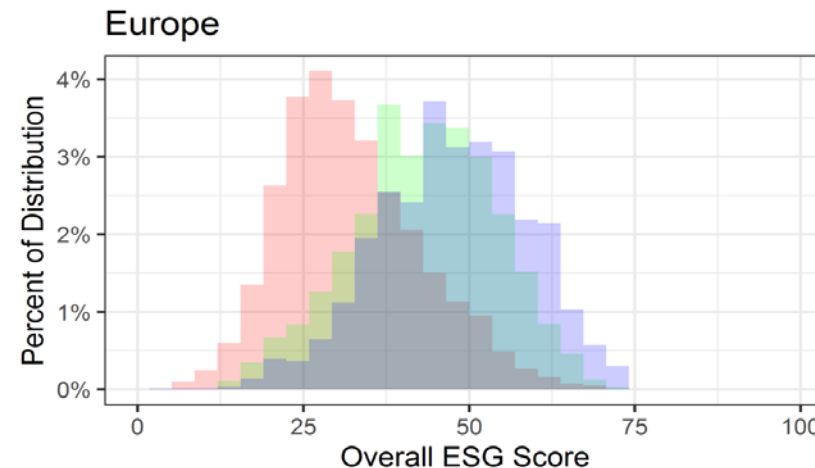
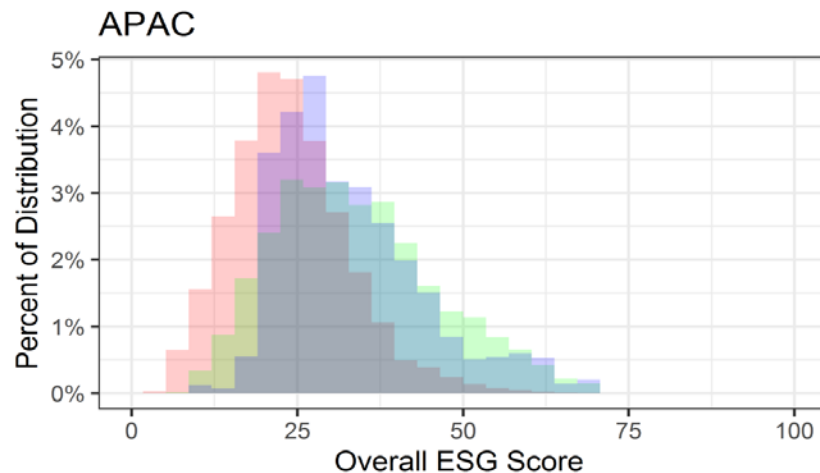


Business Size

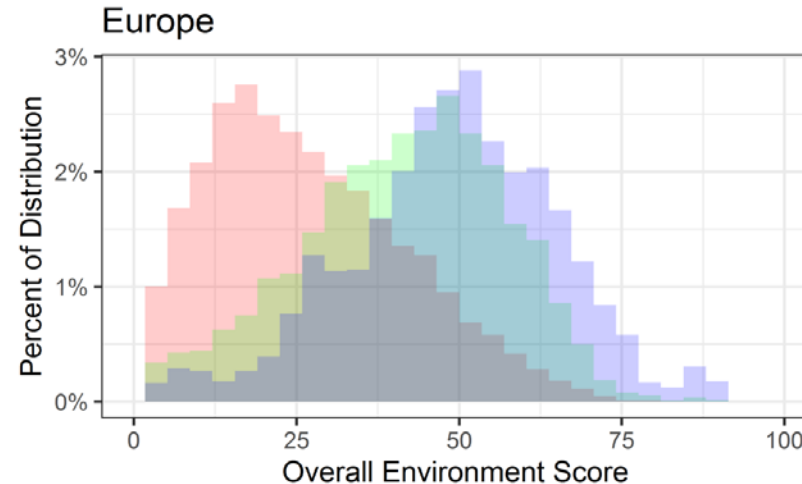
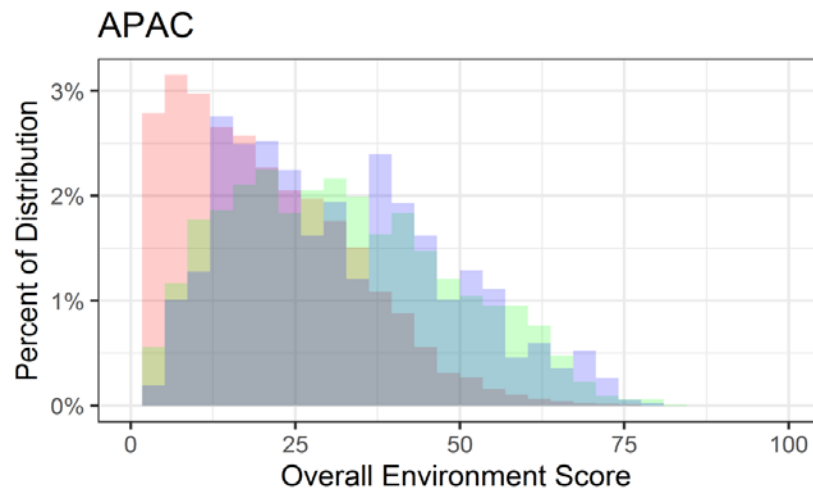
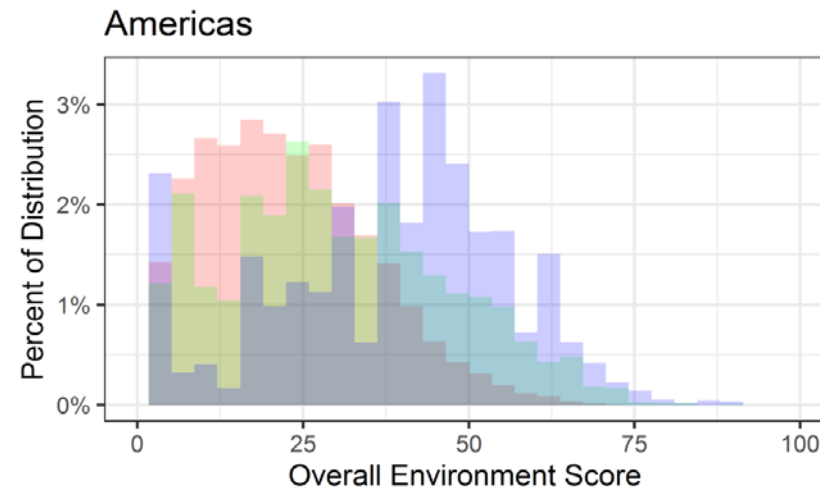
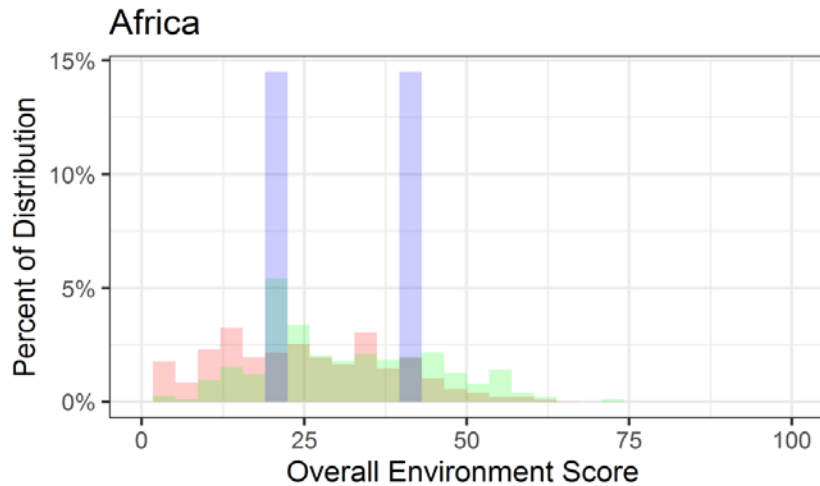
>2.6 Billion USD

2.6M – 206 Billion USD

<2.6 million USD



E Score Example: Heterogeneity by Region

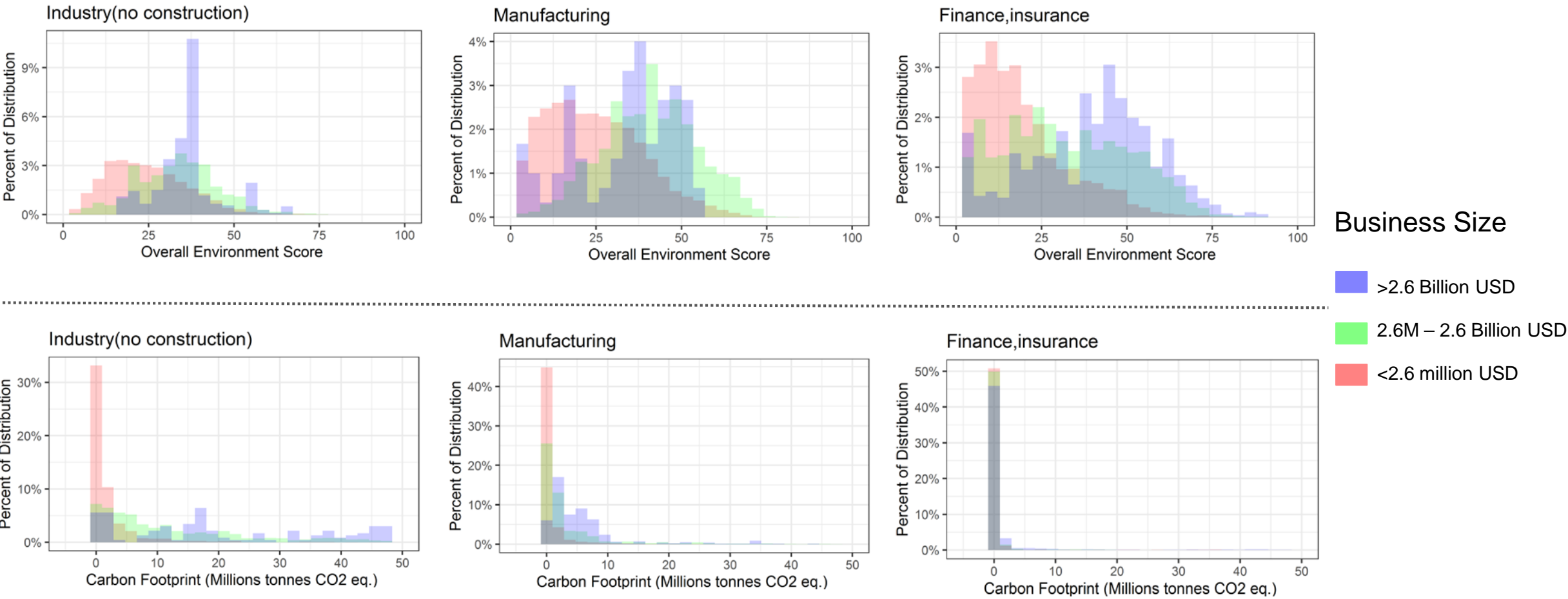


Business Size

- >2.6 Billion USD
- 2.6M – 2.6 Billion USD
- <2.6 million USD

Combining Metrics for More Insight

E Score and Carbon Footprint (Scope 1 + 2) for selected industries



3

Illustrative Portfolio Analysis

Two Illustrative Portfolios

Company composition differs by size, industry and location

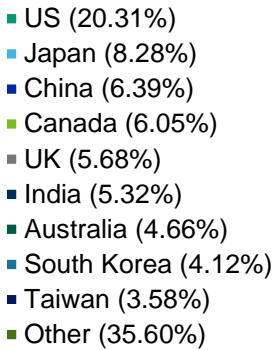
PORTFOLIO A

107
Countries

20
Industries

62,632
companies

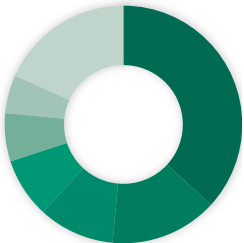
Location



Size

Company Turnover mln USD	Exposure
< 1	2.04%
[1-100)	35.11%
[100-1,000)	44.12%
1,000>=	18.73%

Industry



Source: Moody's Market Implied Ratings (MIR)

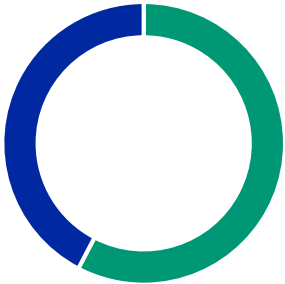
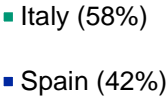
PORTFOLIO B

2
Countries

18
Industries

17,094
companies

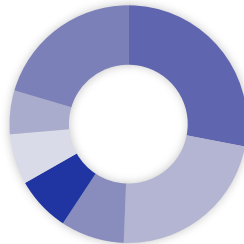
Location



Size

Company Turnover mln USD	Exposure
< 1	1.59%
[1-100)	43.60%
[100-1,000)	54.38%
1,000>=	0.43%

Industry



Source: European Data Warehouse(EDW)

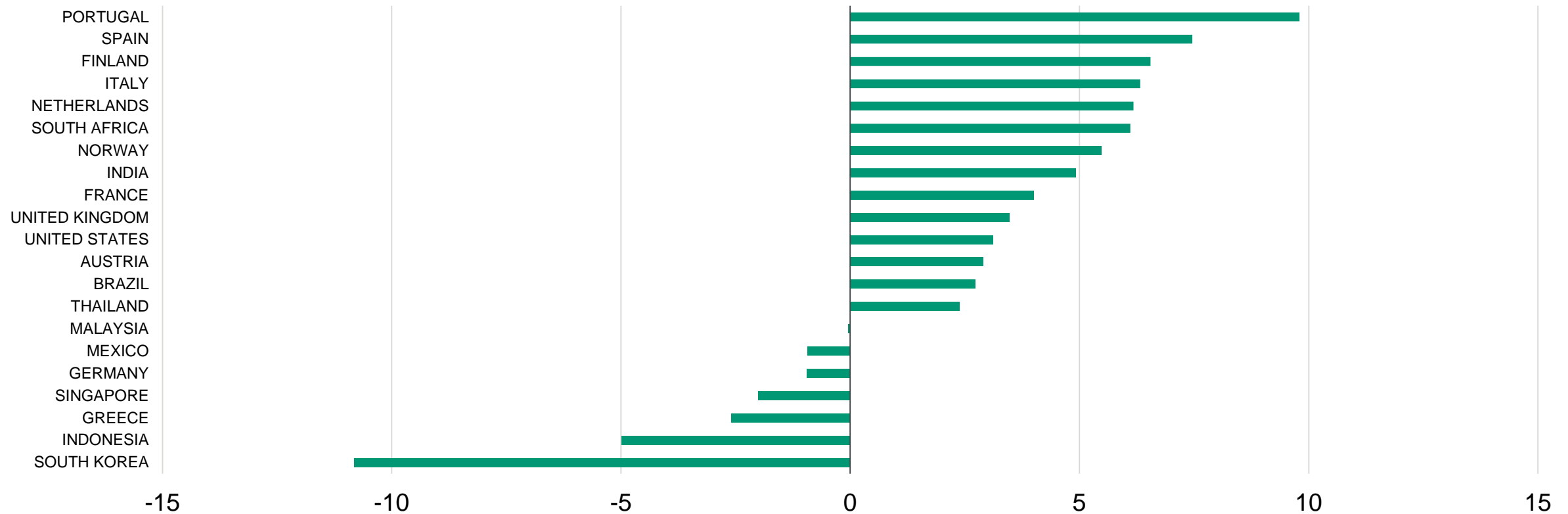
Portfolio A: Multifaceted ESG and Climate Risk

Metrics in deviations from portfolio average

Industries, NACE 1	Exposure	ESG	E	S	G	Physical Risk Management	Energy Transition	Carbon Emissions (Scope 1 +2)
Manufacturing	37%							
Financial & insurance	15%							
Information & communication	10%							
Mining & quarrying	8%							
Wholesale & retail trade	7%							
Real estate	5%							
Professional, scientific & technical	3%							
Construction	3%							
Administrative & support service	3%							
Transportation & storage	2%							
Electricity, gas, steam & AC supply	2%							
Accommodation & food service	2%							
Agriculture, forestry & fishing	1%							
Human health & social work	1%							
Arts, entertainment & recreation	1%							
Water supply, sewerage & waste mgmt	1%							
Education	0.42%							
Other services	0.29%							
Public administration & defence	0.01%							
Households as employers	0.01%							

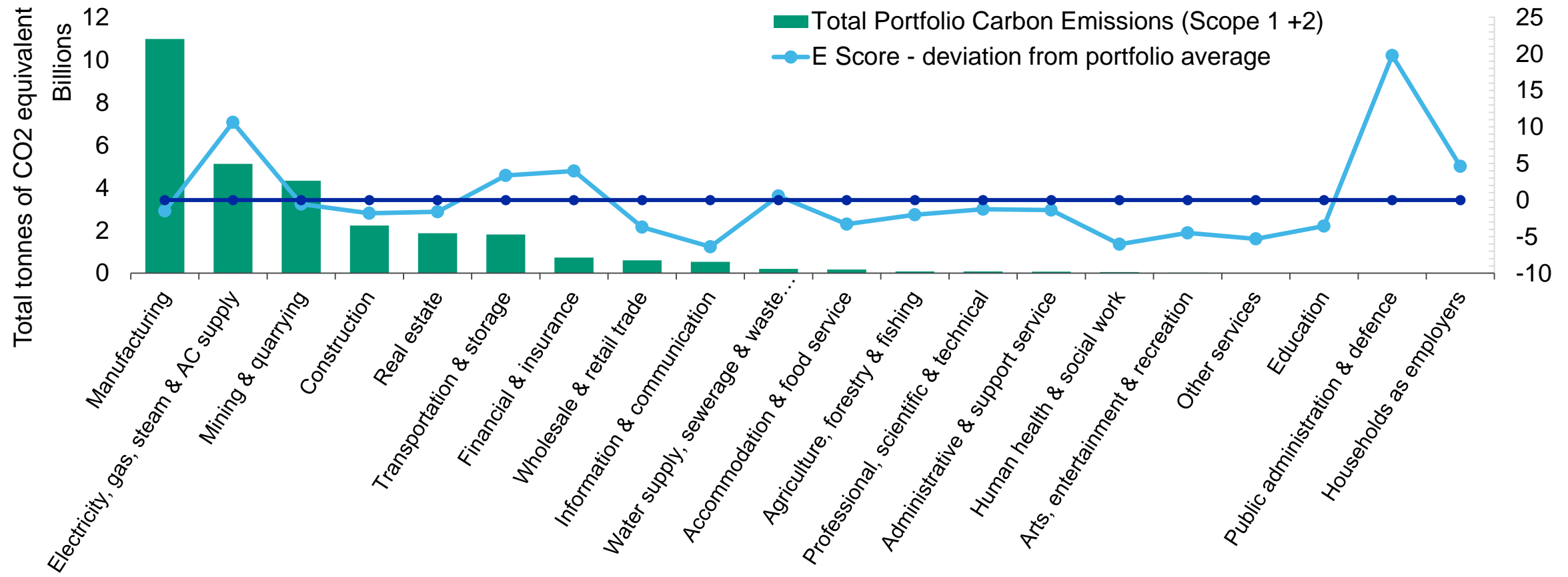
Portfolio A: Heterogeneity Across Locations

Deviation of ESG scores from portfolio average, selected countries



Portfolio A: CO₂ Emissions and E Score

Point-in-time and forward-looking view by industries

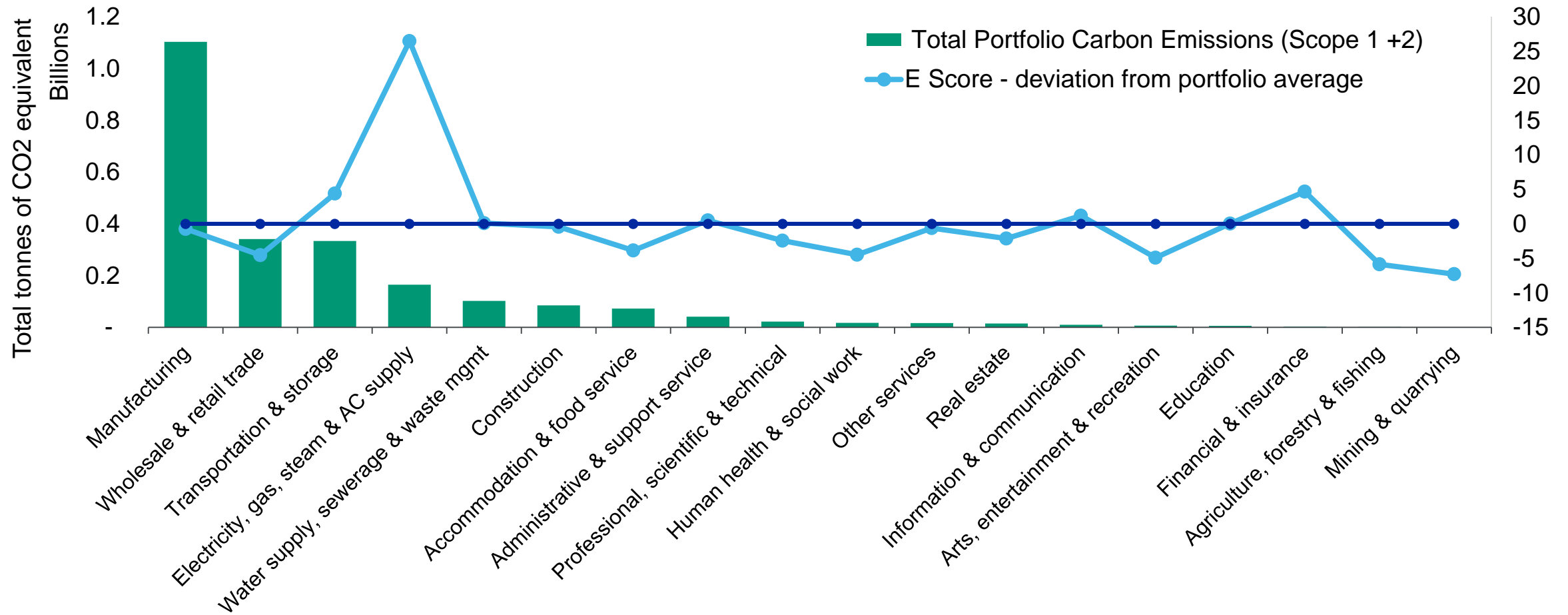


Portfolio B: Multifaceted ESG and Climate Risk

Metrics in deviations from portfolio average

Industries, NACE 1	Exposure	ESG	E	S	G	Physical Risk Management	Energy Transition	Carbon Emissions (Scope 1 +2)
Wholesale & retail trade	28%							
Manufacturing	23%							
Construction	9%							
Accommodation & food service	7%							
Transportation & storage	7%							
Real estate	6%							
Professional, scientific & technical	6%							
Administrative & support service	4%							
Human health & social work	3%							
Information & communication	3%							
Other services	2%							
Arts, entertainment & recreation	2%							
Education	1%							
Water supply, sewerage & waste mgmt	1%							
Electricity, gas, steam & AC supply	1%							
Agriculture, forestry & fishing	0.22%							
Financial & insurance	0.21%							
Mining & quarrying	0.01%							

Portfolio B: CO₂ Emissions and E Score



Key Takeaways

ESG and climate risk for identification, quantification and integration



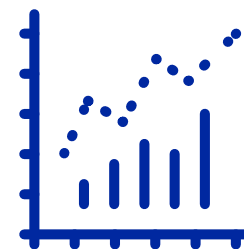
Bridging Data Gaps

The assessment of ESG and climate risk management is possible either through direct company assessment or building score estimates if direct assessment is not available.



Assessment Levels

Granularity of the assessment vary depending on company type and data availability. Adapted methodologies can be applied for SME or other unlisted companies.



Assessment Methodologies

Quantitative models can support portfolio vulnerability assessment and profiling. Especially when the data gaps are present and/or the number of companies in a portfolio is large.

Q&A session

MOODY'S
ANALYTICS

*Better
Faster
Decisions*

moodyanalytics.com

© 2021 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND/OR ITS CREDIT RATINGS AFFILIATES ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S INVESTORS SERVICE DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S INVESTORS SERVICE CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing its Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$2,700,000. MCO and Moody's investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moody.com under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY125,000 to approximately JPY250,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.