
R-Factor Scoring System: Bringing Transparency to ESG Investing

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Agenda

R-Factor™ Scoring System

Leveraging R-Factor™ to Support Sustainable Capital Markets

- Product Development
 - Reporting & Analytics
 - Company Engagement
-

R-Factor™

Scoring System:

Data Driven Investment Solutions

Sustainable Investing Approaches

Exclusionary Screening

Exclude companies, sectors or countries based on ethical values, regulations or norm-based violations

ESG Best-In-Class

Investment in sectors and companies selected for superior ESG performance relative to universe or industry peers

Climate Solutions

Align asset allocation with a transition to low carbon economy and build climate resilient portfolios

ESG Integration

Incorporate ESG data as part of the investment process to improve risk adjusted returns






ESG Research

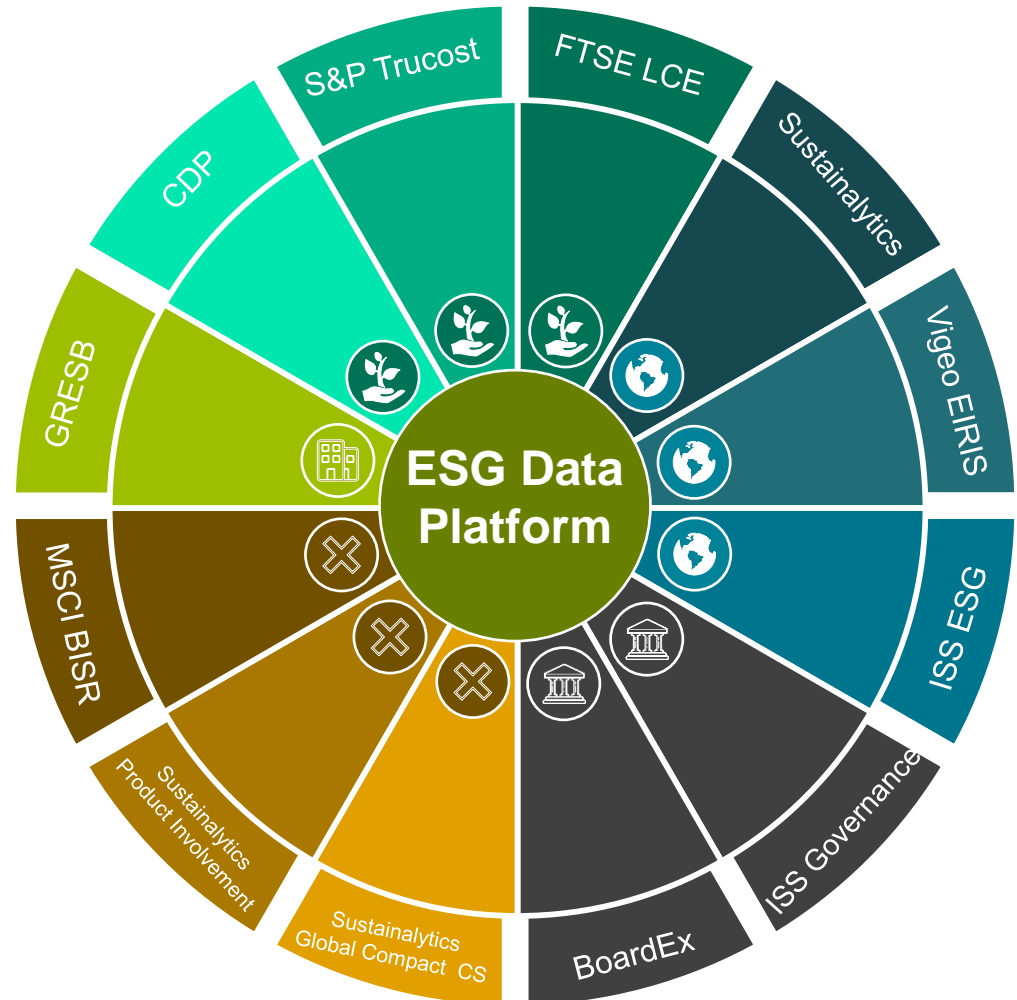
Asset Stewardship

Reporting & Analytics

The Data Platform

Empirical Foundation to Build Sustainable Investing Solutions

-  General ESG
-  Climate/Carbon
-  Governance
-  Real Assets
-  Business Involvement/
Screening Capabilities



Source: State Street Global Advisors

Why Create R-Factor™?

ESG Scores Differ by Provider¹

	Sustainalytics	MSCI	RobecoSAM	Bloomberg
Sustainalytics	1.0	0.53	0.76	0.66
MSCI	—	1.0	0.48	0.47
RobecoSAM	—	—	1.0	0.68
Bloomberg	—	—	—	1.0

Exhibit 1: Cross Sectional Correlation of ESG Ratings

Investor Take Away:

- Data treatments and portfolio construction are critical to account for the differences across data provider
- Indexing, smart beta, and active quantitative research must carefully integrate ESG data with respect to investment objectives and the risk-return profile of portfolios
- Investment research should focus on financially material information at indicator level

Source:

-Bender, Bridges, He, Lester, Sun, 2018. A Blueprint for Integrating ESG into Equity Portfolios.

-Berg, Koelbel, Rigobon, 2019. Aggregate Confusion: The Divergence of ESG Ratings.

Why ESG Scores Differ by Provider²

		Scope	Measurement	Weights
KLD	Vigeo-Eiris	0.42	0.61	0.27
KLD	RobecoSam	0.35	0.62	0.32
KLD	Sustainalytics	0.32	0.55	0.31
KLD	Asset4	0.35	0.58	0.47
Vigeo-Eiris	RobecoSam	0.32	0.38	0.11
Vigeo-Eiris	Sustainalytics	0.39	0.51	0.24
Vigeo-Eiris	Asset4	0.30	0.48	0.18
RobecoSam	Sustainalytics	0.32	0.54	0.17
RobecoSam	Asset4	0.27	0.50	0.16
Sustainalytics	Asset4	0.18	0.45	0.33
Average		0.32	0.52	0.26

Table 7. Arithmetic Decomposition

Investor Take Away:

- ESG rating agencies adopt different definitions of ESG performance and adopt different approaches to measuring ESG performance—resulting in scope divergence, weight divergence, and aggregation divergence
- Investors need to focus on indicator level, aggregation rules, AND standardizations of the measurement procedures are required

Why Use the Materiality Concept?

Academic, Industry & State Street Global Advisors Research

Academic Research

Financially material ESG factors have a impact on the long term performance of a company



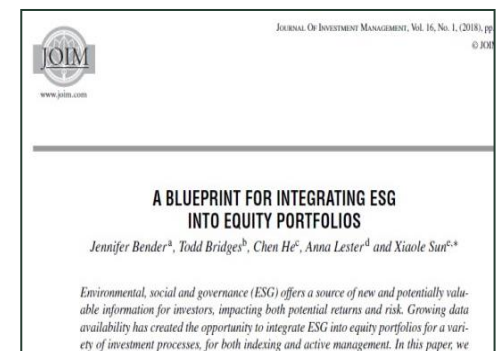
Industry Research

Financially material ESG factors have a impact on the long term performance of a company



SSGA Research

Efficient ESG integration with careful consideration of the risk-return on equity and fixed income portfolios



What is R-Factor™ ?

R-Factor™ is our ESG scoring system that draws on multiple data sources and leverages widely accepted, transparent materiality frameworks to generate a unique ESG score for listed companies.

**Focuses on
Financial
Materiality**

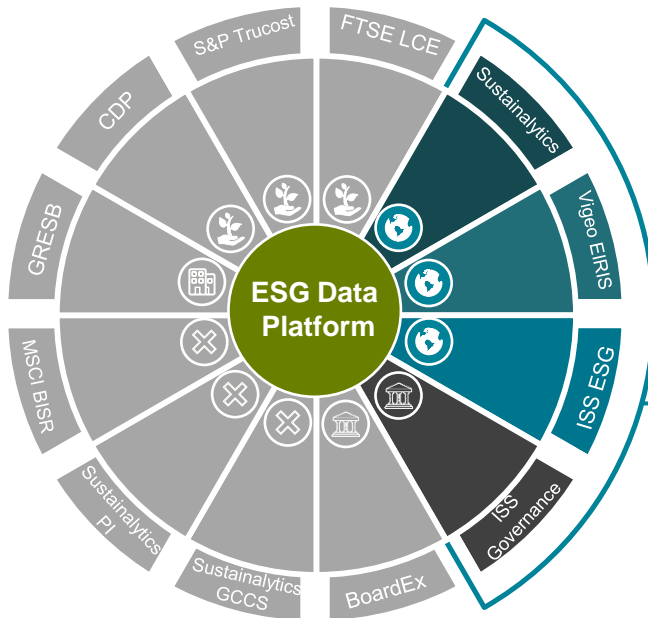
**Uses Commonly
Accepted
Standards and
Transparent
Frameworks**

**Powered by
Multiple Data
Sources**

**Leverages
Corporate
Governance &
Stewardship**

R-Factor Scoring System

Innovative, transparent scoring model creating one “responsibility factor” score per company



ESG Scores

Maps to SASB's five sustainability dimensions, 26 general issues, and covers 77 industries:

- Environmental
- Social capital
- Human capital
- Human capital business model & innovation
- Leadership & governance



Corporate Governance Scores

Maps to national and market corporate governance codes, and covers 17 regions:

- Board accountability
- Shareholder rights & engagement
- Board independence & effectiveness
- Alignment of compensation to long-term strategy

R-Factor Scores

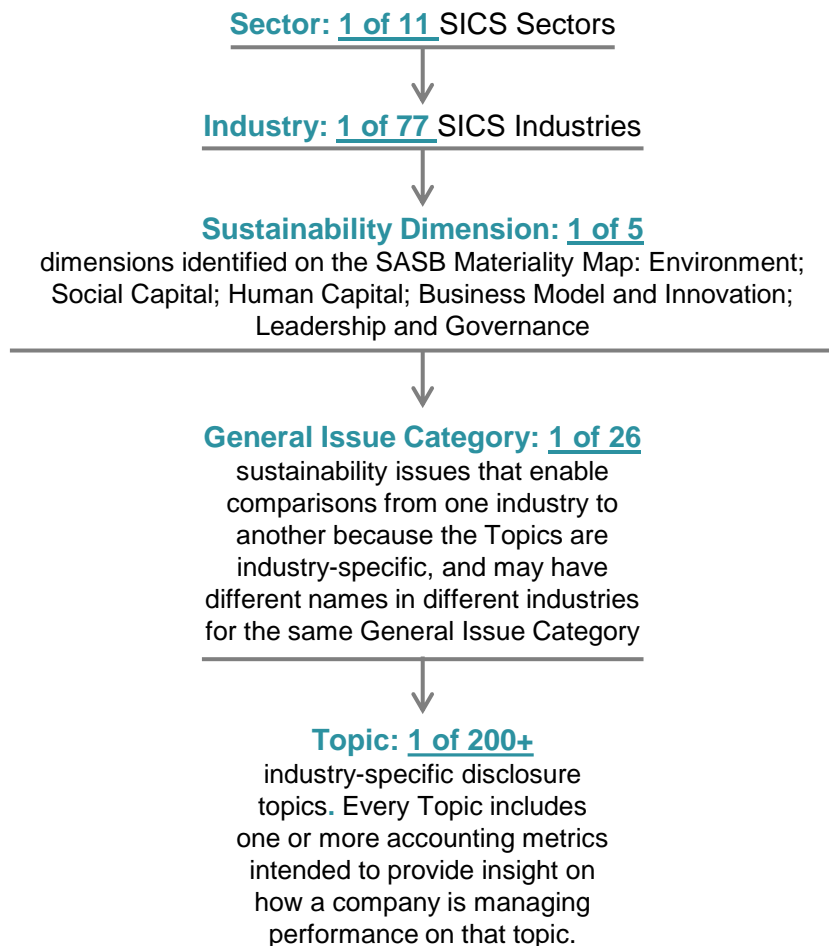
- 6,000+ company level scores
- 5+ years history
- Scores range from 0-100
- Comparable across industries

How are R-Factor™ Scores Designed?

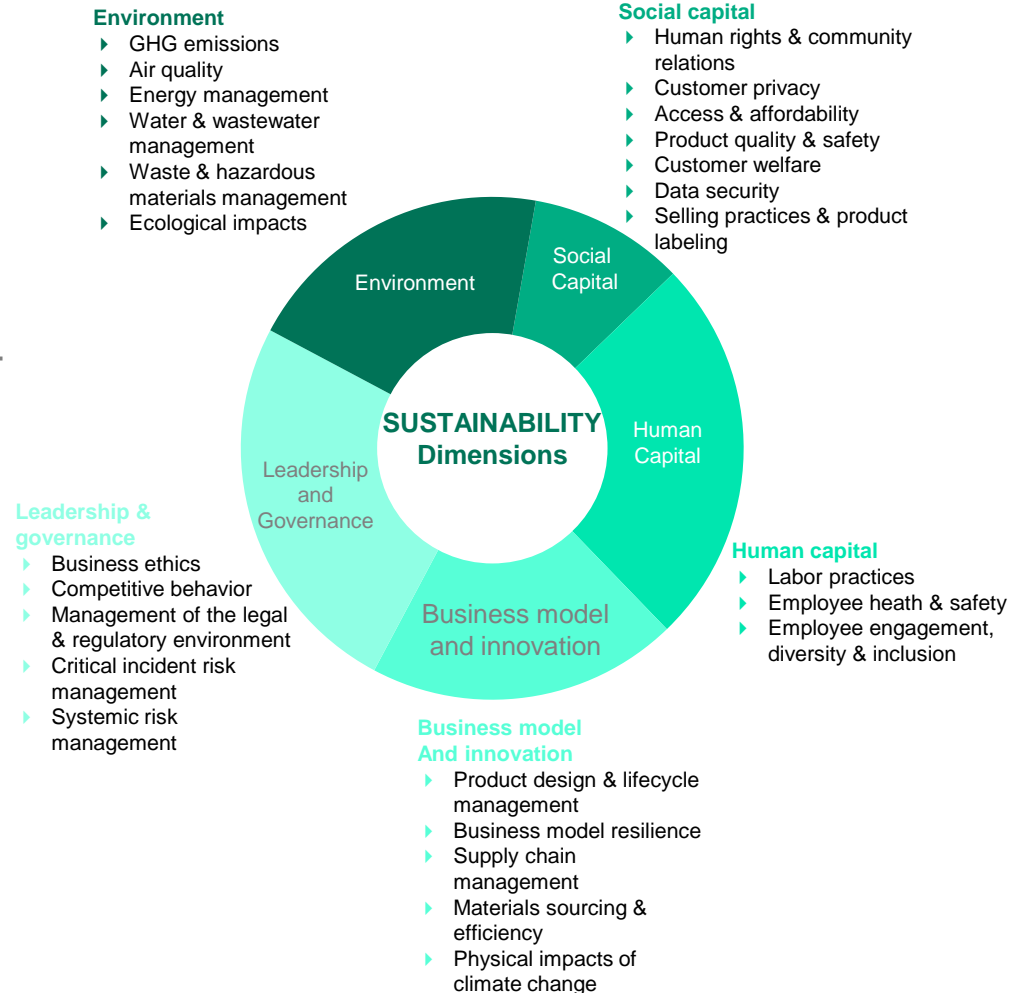
	Data Characteristics	Frameworks	Data Sources	Metrics (raw)
ESG Score	Industry Dynamics	Sustainability Accounting Standards Board (SASB)	Sustainalytics Vigeo-Eiris ISS ESG	450+
CorpGov Score	Market Dynamics	17 National & Market Developed Corporate Governance Codes	ISS-Governance	150+
R- Factor™ Score	Industry + Market Dynamics	Transparent, commonly accepted materiality framework + national governance codes	4 Data Providers	650+

SASB Framework: Taxonomy & Metrics

SASB Data Hierarchy & Taxonomy:



SASB Sustainability Weights & Metrics:



Aligning SASB with R-Factor Scoring System

5 Sustainability Dimensions

26 General Issues

200+ ESG Topics

SECTORS	Consumer Goods							Extractives & Minerals Pro				
	Apparel, Accessories & Footwear	Appliance Manufacturing	Building Products & Furnishings	E-Commerce	Household & Personal Products	Multiline and Specialty Retailers &	Toys & Sporting Goods	Coal Operations	Construction Materials	Iron & Steel Producers	Metals & Mining	Oil & Gas – Exploration & Production
INDUSTRIES												
Environment												
GHG Emissions	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
Air Quality	N	N	N	N	N	N	N	N	Y	Y	Y	Y
Energy Management	N	N	Y	Y	N	Y	N	N	Y	Y	Y	N
Water & Wastewater Management	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y
Waste & Hazardous Materials Management	N	N	N	N	N	N	N	Y	Y	Y	Y	N
Ecological Impacts	N	N	N	N	N	N	N	Y	Y	N	Y	Y
Social Capital												
Human Rights & Community Relations	N	N	N	N	N	N	N	Y	N	N	Y	Y
Customer Privacy	N	N	N	Y	N	N	N	N	N	N	N	N
Data Security	N	N	N	Y	N	Y	N	N	N	N	N	N
Access & Affordability	N	N	N	N	N	N	N	N	N	N	N	N
Product Quality & Safety	Y	Y	Y	N	Y	N	Y	N	N	N	N	N
Customer Welfare	N	N	N	N	N	N	N	N	N	N	N	N
Selling Practices & Product Labeling	N	N	N	N	N	N	N	N	N	N	N	N
Human Capital												
Labor Practices	N	N	N	N	N	Y	N	Y	N	N	Y	N
Employee Health & Safety	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
Employee Engagement, Diversity & Inclusion	N	N	N	Y	N	Y	N	N	N	N	N	N
Business Model & Innovation												
Product Design & Lifecycle Management	N	Y	Y	Y	Y	Y	N	N	Y	N	N	N
Business Model Resilience	N	N	N	N	N	N	N	Y	N	N	N	Y
Supply Chain Management	Y	N	Y	N	Y	N	Y	N	N	Y	N	N
Materials Sourcing & Efficiency	Y	N	N	N	N	N	N	N	N	N	N	N
Physical Impacts of Climate Change	N	N	N	N	N	N	N	N	N	N	N	N
Leadership & Governance												
Business Ethics	N	N	N	N	N	N	N	N	N	N	Y	Y
Competitive Behavior	N	N	N	N	N	N	N	N	Y	N	N	N
Management of the Legal & Regulatory Environment	N	N	N	N	N	N	N	N	N	N	N	Y
Critical Incident Risk Management	N	N	N	N	N	N	N					Y
Systemic Risk Management	N	N	N	N	N	N	N	N	N	N	N	N

Likely a material issue for companies in the industry
 Not Likely a material issue for companies in the industry

Source: SASB

Focus on Financial Materiality:

Sector Example

Asset Management + Custody Industry

- Selling Practices + Product Labelling
- Employee Engagement, Diversity + Inclusion
- Product Design + Lifecycle Management
- Business Ethics
- Systemic Risk Management

Household + Personal Products Industry

- Water + Waste Management
- Product Quality + Safety
- Product Design + Lifecycle Management
- Supply Chain Management

Focus on Financial Materiality:

ESG Score Calculation

Step 1:

For each data provider establish relevancy of metric to the SASB framework

	Sustainalytics	ISS-ESG	Vigeo-Eiris
Total Number of Metrics Delivered by Data Provider	180	1,850	140
Number of Metrics Material to the SASB Framework	91	325	63

Step 2:

Group Metrics Relevant from each data provider to the SASB framework at the General Issue level

SASB General Issues	Sustainalytics
Access & Affordability	6
Air Quality	1
Business Ethics	4
Business Model Resilience	3
Competitive Behavior	1
Critical Incident Risk Management	2
Customer Privacy	1
Customer Welfare	2
Data Security	0
Ecological Impacts	3
Employee Engagement, Diversity & Inclusion	4
Employee Health & Safety	4
Energy Management	2
GHG Emissions	5
Human Rights & Community Relations	4
Labor Practices	6
Management of the Legal & Regulatory Environment	3
Materials Sourcing & Efficiency	6
Physical Impacts of Climate Change	1
Product Design & Lifecycle Management	9
Product Quality & Safety	4
Selling Practices & Product Labeling	3
Supply Chain Management	11
Systemic Risk Management	2
Waste & Hazardous Materials Management	2
Water & Wastewater Management	2
Total Items	91

Step 3:

Identify industry specific material General Issues

As an example, Financial Materiality is switched on and off for two industries / firms

State Street Corporation (STT)			
Industry: Asset Management and Custody Activities			
SASB General Issues	Sustainalytics	ISS-ESG	Vigeo-Eiris
Selling Practices & Product Labeling	3	21	2
Employee Engagement, Diversity & Inclusion	4	9	4
Product Design & Lifecycle Management	9	57	7
Business Ethics	4	4	2
Systemic Risk Management	2	3	1
Total Metrics	22	94	16

Unilever PLC (UL)			
Industry: Household and Personal Products			
SASB General Issues	Sustainalytics	ISS-ESG	Vigeo-Eiris
Water & Wastewater Management	2	4	1
Product Quality & Safety	4	11	1
Product Design & Lifecycle Management	9	57	7
Supply Chain Management	11	6	2
Total Metrics	26	78	11

Source: State Street Global Advisors

Aligning Corporate Governance Codes with Scoring System

Market	Issuing Authority and Code
Australia	ASX: Corporate Governance Principles and Recommendations
Denmark	Committee on Corporate Governance: Recommendations on Corporate Governance
Finland	Securities Market Association: Finnish Corporate Governance Code 2015
France	AFEP & MEDEF: Corporate Governance Code of Listed Corporations
Germany	Regierungskommission: Deutscher Corporate Governance Kodex
Hong Kong	HKEX: Corporate Governance Code and Corporate Governance Report
ICGN**	International Corporate Governance Network: Global Corporate Governance Principles
Italy	Borsa Italiana Corporate Governance Committee: Corporate Governance Code
Japan	JPX: Japan's Corporate Governance Code
Netherlands	Monitoring Committee Corporate Governance Code: The Dutch Corporate Governance Code
Norway	Norwegian Corporate Governance Board: The Norwegian Code of Practice for Corporate Governance
Singapore	Monetary Authority of Singapore: Code of Corporate Governance
Spain	Comisión Nacional del Mercado de Valores: The Unified Good Governance Code of Listed Companies
Sweden	Swedish Corporate Governance Board: The Swedish Corporate Governance Code
Switzerland	Economiesuisse: Swiss Code of Best Practices for Corporate Governance
United Kingdom	Financial Reporting Council: The UK Corporate Governance Code
United States**	Investor Stewardship Group: Corporate Governance Principles

CorpGov component of score maps data to 17 corporate governance codes developed by regulators or investors

- 15 country codes set by regulators
- 2 codes designed by investors**

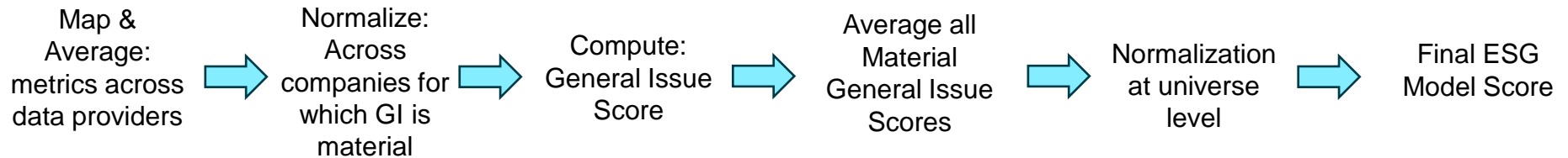
Source: State Street Global Advisors

Model Design & Matlab Code

SASB General Issue	Data Provider	Metric	Score	Average	Metric Scale
Employee Engagement, Diversity & Inclusion	Sustainalytics	#1	50.00	40.00	0 to 100
	Sustainalytics	#2	50.00		0 to 100
	Sustainalytics	#3	20.00		0 to 100
	Sustainalytics	#4	N/A		0 to 100
	ISS-ESG	#1	2.64	2.04	1 to 4
	ISS-ESG	#2	2.93		1 to 4
	ISS-ESG	#3	2.25		1 to 4
	ISS-ESG	#4	2.75		1 to 4
	ISS-ESG	#5	1.74		1 to 4
	ISS-ESG	#6	2.01		1 to 4
	ISS-ESG	#7	1.00		1 to 4
	ISS-ESG	#8	1.00		1 to 4
	ISS-ESG	#9	N/A		1 to 4
	Vigeo-EIRIS	#1	10.00	14.67	0 to 100
	Vigeo-EIRIS	#2	17.00		0 to 100
	Vigeo-EIRIS	#3	17.00		0 to 100
	Vigeo-EIRIS	#4	N/A		0 to 100

Scores as of 5/31/2019

Model Design & Matlab Code



- Data Provider scores are averaged across all the metrics sourced from a particular data provider, which are mapped to one specific SASB General Issue.
- Scores are then normalized across all companies for which that SASB General Issue is **Material**.
- Normalized scores are then averaged. That new, single rating is the SASB General Issue score.
- Final ESG Score is the average of all of the material General Issue Scores and final rating has been normalized at the universe level.

*if only two data providers cover that company, the General Issue score will be generated by taking the average of those two scores. If only one data provider is covering the company, no averaging is necessary.

Leveraging R-Factor™ to Support Sustainable Capital Markets

Bloomberg SASB Indices

Socially Responsible Investment Benchmarks

Bloomberg US Equity Indices

Aggregate, Large Cap (market capitalization), Value, Growth and Dividend Yield indices.

Bloomberg SASB ESG Indices

Market Cap indices are reweighted relative to strength of R-Factor™ score. Controversy screened option.

A socially responsible **policy benchmark** alternative for asset owners.

Bloomberg SASB ESG Select Indices

Optimized to maximize exposure to R-Factor™ score while limiting active risk. Controversy-screened option.

R-Factor Powers Client Reporting

Gives Clients Transparency into Across Portfolio Holdings

Institutional Client Reporting will provide all our clients a limited scope of ESG-related metrics, including:

- **R-Factor Scores, Positions and Holdings.** Revealing a fund/portfolio's R-Factor profile, with best and worst R-Factor positions and scores.
- **R-Factor Momentum Profile.** Showcasing the evolution of a fund/portfolio's R-Factor rating across the previous years.
- **Carbon Intensity Profile.** Shows how fund/portfolio carbon emissions have changed over a 12 mo. period.
- **Stewardship Profile.** Including votes and engagements on issues such as gender diversity, climate.

ESG Performance and Analysis - Investment Program

As of 31 May 2019
Investment Advisors LLC

R-Factor™ Summary

Retirement Plan for Client.

Mandate A Name
Benchmark Name

R-Factor Summary	Mandate	Benchmark	Difference
R-Factor	61.00	61.00	00.00
ESG	55.00	55.00	00.00
Corporate Governance	6.00	6.00	00.00

Source: SSGA as of 31 May 2019

What is R-Factor?

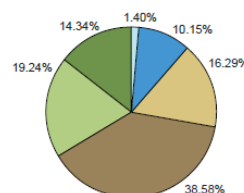
R-Factor™ is built off a transparent scoring methodology that leverages the Sustainability Accounting Standards Board (SASB) Materiality Map, corporate governance codes, and inputs from four best-in-class ESG data providers. R-Factor supports the development of sustainable capital markets by giving investors the ability to invest in solutions that integrate financially material ESG data while incentivizing companies to improve their ESG practices and disclosure in areas that matter.

Mandate Coverage	Count	Percent of Total	Percent of Total Market Cap
R-Factor Securities Coverage	475	95%	95%
Total Number of Securities in Portfolio	500		

Source: FactSet/SSGA as of 31 May 2019

Mandate R-Factor Profile	
Not Available	1.40%
Laggard	10.15%
Underperformer	16.29%
Average Performer	38.58%
Outperformer	19.24%
Leader	14.34%

Source: FactSet/SSGA as of 31 May 2019.



The R-Factor summary reflects certain ESG characteristics only, and does not reflect the portfolio's performance. Please see Important Information section for more information and definitions of the ESG Metrics presented.

State Street Global Advisors Report ID: 2230927.1 Published: 31 May 2019

As of 30 Jun 2019

Top 10 Positions	Mandate Weight	Benchmark Weight	Difference	R-Factor Rating
Apple Inc.	3.15%	3.18%	-0.04%	70.30
Microsoft Corporation	3.10%	3.15%	-0.05%	74.20
Amazon.com, Inc.	2.54%	2.58%	-0.04%	45.20
FaceBook, Inc. Class A	1.39%	1.40%	-0.01%	59.00
Berkshire Hathaway Inc. Clas...	1.38%	1.37%	0.01%	44.60
Alphabet Inc. Class C	1.26%	1.26%	0.00%	63.60
Alphabet Inc. Class A	1.24%	1.24%	0.01%	63.60
Exxon Mobil Corporation	1.21%	1.21%	0.00%	64.00
JPMorgan Chase & Co	1.19%	1.18%	0.01%	74.80
VISA	1.03%	0.97%	0.06%	64.90

Source: FactSet/SSGA as of 31 May 2019

Top 5 R-Factor Ratings

Apple Inc.	0.88%	0.85%	0.03%	87.40
Microsoft Corporation	0.05%	0.02%	0.04%	86.00
Amazon.com, Inc.	1.40%	0.02%	-0.04%	59.00
FaceBook, Inc. Class A	2.54%	2.58%	-0.01%	45.00
Berkshire Hathaway Inc. Clas...	1.38%	1.37%	0.01%	44.60

Source: FactSet/SSGA as of 31 May 2019

Bottom 5 R-Factor Ratings

Equifax INC	0.05%	3.18%	0.04%	41.40
Seaboard Corporation	0.00%	3.15%	0.03%	41.20
Nektar Therapeutics	0.05%	2.58%	0.02%	41.10
SBA Corporation Corp C...	1.39%	1.40%	-0.01%	59.00
Qurate Retail, Inc. Class A	1.38%	1.37%	-0.01%	44.60

Source: FactSet/SSGA as of 31 May 2019

Source: SSGA

R-Factor Powers Client Analytics

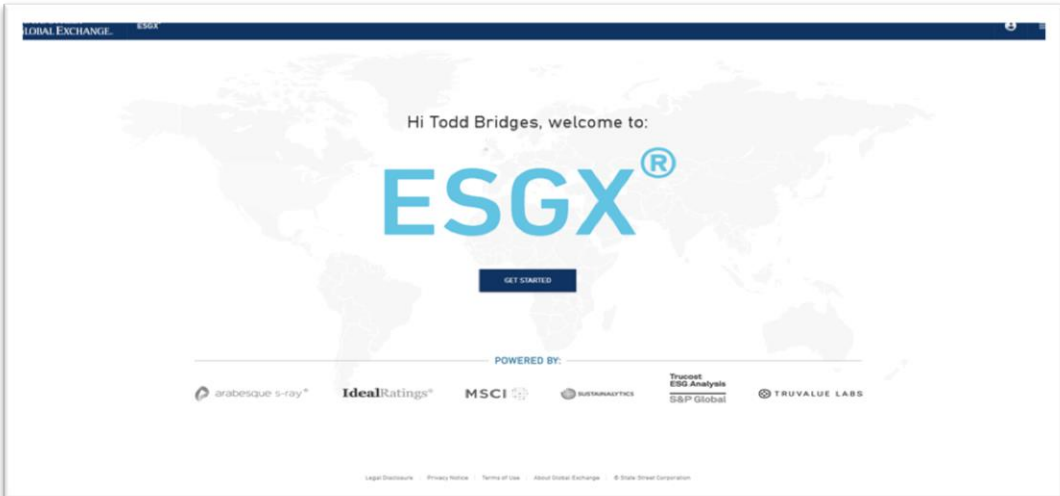
Gives Clients Transparency into Dynamic Portfolio Holdings

This **client facing analytics solution** leverages the existing technology and capabilities of ESGX® and tailors a unique solution to meet the demands of SSGA.

Over time, this solution would allow GA to scale their reporting and analytics needs across equity and fixed income—and potentially real estate.

Employees and clients will be able to analyze their exposures to material non-traditional financial factors, climate-related factors, and the R-Factor proprietary scores.

The reporting and analytics solutions will be designed to give SSGA users more transparency into the potential sources of ESG risk and opportunities



Source: SSGA

R-Factor Powers Company Engagements

Gives Companies Transparency into their Sustainability Rating

1. How is company performing vs. peers on SASB general issues?

Electrical and Electronic Equipment Industry

	Ticker	Industry Average	
		Global	US
R-Factor Score	55	54	56
Product – Quality Safety	45	52	51
Product Design - Lifecycle Mgmt.	45	51	47
Materials Sourcing - Efficiency	60	51	58
Business Ethics	62	51	61
Energy Mgmt.	49	52	45
Waste - Hazardous Materials Mgmt.	44	48	46

Underperforming vs. Global peers
Overperforming vs. Global peers

2. What specific areas does SASB suggest ESG disclosure on?

Product Quality + Safety Metrics

- Number of recalls issued, total units recalled
- Total amount of monetary losses as a result of legal proceedings associated with product safety

Product Design & Lifecycle Management Metrics

- % eligible products, by revenue, that meet ENERGYSTAR criteria
- Revenue from renewable energy-related and energy-efficiency-related products
- % products by revenue that contain EIC62474 declarable substances

As of May 15 2019

Appendix A: Biographies

Biography



Todd Arthur Bridges, Ph.D.

Head of ESG Research & Development

Todd Arthur Bridges, Ph.D., Head of ESG Research and Strategy Development at State Street Global Advisors is on the Global Equity Beta Solutions Team. The Global Equity Beta Solutions research team is responsible for research across index equities, smart beta, ESG, and climate. The team leads the thought-leadership efforts in these areas through white papers and strategy research development. Prior to joining State Street Global Advisors in 2017, Mr. Bridges was Head of Research at Ethic in Silicon Valley (San Francisco). In that role, he helped build the financial technology startup, and was responsible for developing the sustainable investing framework, integrating ESG data into portfolio management, and developing shareholder engagement strategies for the platform. Prior to joining this entrepreneurial venture, he was Managing Director of a cross-disciplinary research institute at Cornell University focused on the role of finance, technology, and governance in sustainable economic development.

Dr. Bridges holds MA and Ph.D. degrees from Brown University, and has completed research fellowships at the National Science Foundation, Max Planck Society for the Advancement of Science, Oxford University, and Harvard University. He has published research and presented findings to central banks, sovereign wealth funds, state pensions, corporate pensions, and scientists in the United States, United Kingdom, EMEA, Russia, and APAC.