



BayernInvest ESG-Reporting Methodology

ESG Methodology

ESG ratings and research provided by MSCI ESG cover over 7,500 companies (13,000 total issuers including subsidiaries) and more than 650,000 equity and fixed income securities to create ESG Ratings, scores and metrics for approximately 32,000 multi-asset class Mutual Funds and ETFs globally. MSCI ESG Fund Ratings aims to provide fund-level transparency to help clients better understand and measure the ESG characteristics of the total portfolio, and rank or screen funds based on a diverse set of ESG exposure categories.

For a detailed methodology please refer to:
www.msci.com/esg-ratings

MSCI ESG FUND RATINGS INCLUSION CRITERIA

Certain MSCI ESG Fund Metrics holdings data is sourced from Lipper (see Notice and Disclaimer). To be included in Fund Metrics, a fund must pass the following three criteria:

- 65% of the fund's gross weight must come from covered securities.**
 - The coverage universe for issuers consists of MSCI ESG Ratings (over 7,500 companies and more than 650,000 equity and fixed income securities globally).
 - Cash positions and other asset types not relevant for ESG analysis are removed prior to calculating a fund's gross weight.
 - The absolute values of short positions are included in a fund's gross weight calculation, but are treated as uncovered for ESG data.
 - Security asset type must have recourse to the rated issuer.
- Fund holdings date must be less than one year old.**
- Fund must have at least ten securities.**

FACTOR CALCULATIONS

While Fund Ratings includes over 200 metrics, the calculation for each one is done according to one of three basic methodologies. The ESG Fund Ratings Methodology document notes which approach is used for each metric.

The first step in all cases (except for "Fund ESG Coverage (%)", which is described separately in the Fund Coverage section) is to exclude any short positions. Weights of the remaining positions are normalized to 100%. Following that, the metrics will utilize one of the three methodologies described here:

Method 1: Weighted Average: This is the sumproduct of security weights and security values for a given metric. Securities without values for the metric being measured are excluded, and the weights of the remaining securities are normalized to 100%.

	Weight	ESG Score	Weight x Score
Security A	50%	4	2.0
Security B	30%	8	2.4
Security C	20%	7	1.4
Total	100%		5.8

Method 2: Metric Weighted Average: This calculation is a slight variation on the Weighted Average calculation described above in Method 1. The distinction is that the Metric Weighted Average includes two different sets of weights; the security weights and the metric weights from the ESG Ratings model. As an example, an Environment Score may represent only 10% of the ESG exposure for one company, but 50% of the ESG exposure for another company. These metric weights are included in the calculation so that the Fund score will accurately represent the exposure from each security.

	Fund Weight	Environment Score	Environment Weight	Fund Weight x Environment Weight	Normalized Weight	Normalized Weight x Environment Score
Security A	50%	2	35%	18%	76%	1.5
Security B	30%	8	5%	2%	7%	0.5
Security C	20%	7	20%	4%	17%	1.2
Total	100%					3.3

Method 3: Percentage Sum: Metrics calculated using Percentage Sum show the percent of the fund that meets the criteria for the metric being measured. The percentage represents a minimum value, as there may be uncovered securities that are also True. For instance, a "Predatory Lending (%)" of 10% means that 10% of the weight of the fund comes from issuers with identified ties to predatory lending. The actual percentage may be higher if the fund holds companies involved in predatory lending that are outside of the product's coverage universe. The security weights used in Percentage Sum calculations are set by excluding short positions, and normalizing the remaining positions to 100%. Note that cash positions are kept in the fund to avoid overstating exposure to the metric. Cash is treated as a portion of the fund that does not meet the criteria to the metric being measured.

The security weights used in Percentage Sum calculations are set by excluding short positions, and normalizing the remaining positions to 100%. Note that cash positions are kept in the fund to avoid overstating exposure to the metric. Cash is treated as a portion of the fund that does not meet the criteria to the metric being measured.

	Fund Weight	Predatory Lending	Predatory Lending %
Security A	40%	✗	-
Security B	30%	✗	-
Security C	20%	✓	20%
Security D	10%	Uncovered	-
Total			20%

FUND ESG QUALITY SCORE

The "Fund ESG Quality Score" assesses the resilience of a fund's aggregate holdings to long term ESG risks. Highly rated funds consist of issuers with leading or improving management of key ESG risks, based on a granular breakdown of a company's business: its core product or business segments, the locations of its assets or revenues, and other relevant measures such as outsourced production. The "Fund ESG Quality Score" is provided on a 0-10 score, with 0 and 10 being the respective lowest and highest possible fund scores.

The "Fund ESG Quality Score" is assessed using the underlying holding's "Overall ESG Scores", "Overall ESG Ratings", and "Overall ESG Rating Trends". It is calculated in a series of 3 steps.

Step 1: Calculate the "Fund Weighted Average ESG Score" of the underlying holding's "Overall ESG Scores". Methodology for the issuer level scores are available in a separate "MSCI ESG Ratings Methodology" document. The table below demonstrates how the "Fund Weighted Average ESG Score" is calculated. Note that in this example, Security E does not have an ESG Score. Security E is therefore "dropped" from analysis, and the weights of the remaining securities are normalized to 100%. The normalized weights and ESG scores are then used to calculate the "Fund Weighted Average ESG Score" of 6.6.

Step 1: Example

	Weight	ESG Score	Normalized Weight	Normalized Weight x Score
Security A	20%	4.0	25%	1.0
Security B	40%	8.0	50%	4.0
Security C	8%	7.0	10%	0.7
Security D	12%	6.0	15%	0.9
Security E	20%	N/A	0%	N/A
Total	100%		100%	6.6

Step 2: Calculate adjustment factor based on fund exposure to "Fund ESG Laggards (%)", "Fund ESG Trend Negative (%)", and "Fund ESG Trend Positive (%)".

Adjustment Factor = "Fund ESG Trend Positive (%)" – "Fund ESG Laggards (%)" – "Fund ESG Trend Negative (%)"

Step 2: Example

	Fund Factors	Fund Values
	Fund ESG Trend Positive	30%
Minus	Fund ESG Laggards	12.95%
Minus	Fund ESG Trend Negative	14.10%
	= Adjustment Factor	2.95%

Step 3: Multiply the "Fund Weighted Average ESG Score" by (1 + adjustment factor).

Step 3: Example

	Fund Factors	Fund Values
	Fund Weight Average ESG Score	6.60
X	1 + Adjustment Factor	2.95%
	= ESG Quality Score	6.79

ESG FUND RATING

The top level fund signal, the "Fund ESG Rating", assesses the resilience of a fund's aggregate holdings to long term ESG risks. Highly rated funds consist of issuers with leading or improving management of key ESG risks.

ESG Ratings		What it means
AAA AA	Leader	The companies that the fund invests in show strong and/or improving management of financially relevant environmental, social and governance issues. These companies may be more resilient to disruptions arising from ESG events.
A BBB BB	Average	The fund invests in companies that show average management of ESG issues, or in a mix of companies with both aboveaverage and below-average ESG risk management.
B CCC	Laggard	The fund is exposed to companies that do not demonstrate adequate management of the ESG risks that they face, or show worsening management of these issues. These companies may be more vulnerable to disruptions arising from ESG events.

The Fund ESG Rating is calculated as a direct mapping of "Fund ESG Quality Score" to letter rating categories.

Fund ESG Quality Score	Fund ESG Rating
8.6* - 10	AAA
7.1 - 8.6	AA
5.7 - 7.1	A
4.3 - 5.7	BBB
2.9 - 4.3	BB
1.4 - 2.9	B
0.0 - 1.4	C

*Appearance of overlap in the score ranges is due to rounding. The 0 to 10 scale is divided into 7 equal parts, each corresponding to a letter rating.

PEER GROUP PERCENTILES

Each fund's overall ESG Quality Score is also shown as a percentile in its peer group. The Fund ESG Quality Score – Peer Percentile represents the percentage of funds in a fund's peer group with an ESG Score equal to, or lower than, the fund's ESG Score.



The peer groups are defined using the Lipper Global Classification Scheme. The following criteria must be met for a fund to receive a Fund ESG Quality Score – Peer Percentile:

1. **The fund must be categorized by the Lipper Global Classification scheme**
2. **The peer group must contain at least 30 funds.**
3. **The standard deviation of the Fund ESG Quality Score within the peer group must be greater than, or equal to, 0.1.**

The Lipper Global Classification Scheme is detailed in ESG Fund Ratings Methodology document.

GLOBAL PERCENTILES

Every fund included in Fund Ratings receives a Fund ESG Quality Score – Global Percentile. The Global Percentile notes the percentage of funds, covered by Fund Ratings, with a score lower than, or equal to, a fund's ESG Quality Score. Considered in conjunction, the Global and Peer Percentiles position a fund from both an absolute (product-wide) and relative (peer category) perspective.

TREATMENT OF CASH & DERIVATES

Cash holdings are removed prior to calculating Fund ESG Coverage (%). Cash is removed because it is outside the scope of ESG relevancy. Including it in the coverage figure would lead to the undesired result of funds failing to meet the coverage threshold due to cash allocations.

The weight of cash is included in all metrics that measure exposure to specific criteria (e.g. Tobacco, Fossil Fuel Reserves, ESG Laggards, etc.). Excluding cash and derivatives from exposure metrics would generate overstated results.

Carbon Methodology

Total Carbon Emissions

tons CO₂e - Measures the absolute greenhouse gas footprint of a portfolio in tons of carbon-dioxide equivalents (tCO₂e). This measures the total annualized greenhouse gas emissions for which an equity portfolios is responsible, based on the "ownership principle" in the Greenhouse Gas Protocol. This is done by summing up the proportionate carbon emissions of companies in the portfolio based on the investor's ownership share.

$$\sum_i \frac{\$investment}{\$issuer's enterprise value_i} * issuer's_emissions_i$$

Relative Carbon Footprint

tons CO₂e / 1000€ invested - Expresses the greenhouse gas footprint of an investment sum. Normalized measure of a portfolio's contribution to climate change that enables comparison with a benchmark, between portfolios and between individual investments. Metrics is Total Carbon Emissions expressed as per currency invested.

Carbon Intensity

tons CO₂e /1000€ invested - Expresses the carbon efficiency of a portfolio and allows investors to measure how much greenhouse gas emissions per 1000€ invested are generated. It is based on the ratio of portfolio carbon emissions normalized by the investor's claims on sales.

$$\frac{\sum_i \frac{\$investment_i}{\$issuer's enterprise value_i} * issuer's_emissions_i}{\sum_i \frac{\$investment_i}{\$issuer's enterprise value_i} * issuer's_sales_i}$$

Weighted Average Carbon Intensity

tons CO₂e /1000€ invested - The Weighted Average Carbon Intensity measures a portfolio's exposure to carbon intensive companies. As companies with higher carbon intensity are likely to face more exposure to carbon related market and regulatory risks, this metrics can serve as a proxy for a portfolio's exposure to potential climate change-related risks.

This metrics is applicable across asset classes, including fixed income, as it's not based on equity ownership basis and does not result in a footprint. It's the sum product of the portfolio weights and Carbon Intensities.

$$\sum_i portfolio_weight_i * issuer's_carbon_intensity_i$$

Background on Greenhouse Gas Emissions

Greenhouse gas (GHG) emissions are classified as per the Greenhouse Gas Protocol and are grouped in categories called Scope 1, Scope 2 and Scope 3.

Scope 1 GHG emissions are those directly occurring "from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles; and "fugitive" emissions."

Scope 2 emissions are "indirect emissions generated in the production of electricity consumed by the institution."

Scope 3 emissions are all the other indirect emissions that are "a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution" such as commuting; embodied emissions from extraction, production, and transportation of purchased goods; outsourced activities; contractor-owned vehicles; and line loss from electricity transmission and distribution". In the tool, Scope 3 emissions are conceptually divided into (a) upstream emissions, i.e. emissions stemming from a company's supply chain and (b) downstream emissions, i.e. emissions from product "use phases" during their life cycle.

Carbon Dioxide Equivalents

CO₂e is the shorthand for carbon dioxide equivalents. It is the standard unit in carbon accounting to quantify greenhouse gas emissions, emissions reductions and carbon credits. It is expressed in tons and written as tCO₂e.

One ton of carbon dioxide has become the standard unit for greenhouse gases and emissions of gases other than carbon dioxide are converted according to their global warming potential. Greenhouse gases that have the greatest influence on atmospheric warming include

- Carbon dioxide
- Methane
- Nitrous oxide
- Water vapour
- Tropospheric ozone
- Chlorofluorocarbons (CFCs)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride

Each has a different contribution to the greenhouse effect with some have a greater global warming potential than others. This is expressed in the global warming potential coefficient (GWP):

- Carbon dioxide (CO₂) GWP: 1
- Methane (CH₄) GWP: 21
- Nitrous oxide (N₂O) GWP: 310
- Hydrofluorocarbons (HFCs) GWP: 140-11'700
- Perfluorocarbons (PFCs) GWP: 6'500-9'200
- Sulphur hexafluoride (SF₆) GWP: 23'900

Global Warming Potentials are based on a 100-year time horizon.

To keep accounting equivalent, each ton of greenhouse gas is divided by its global warming potential and expressed in tCO₂e. CO₂e was an important breakthrough in finding climate change policy and solutions for global warming because it provides a standard unit that can be measured, has a price in many geographies and is agreed on by all stakeholders.

Carbon Emissions Calculations and Emission Source

The Analysis is based on direct and indirect company emissions (Scope 1 and Scope 2). Scope 3 emissions are only being reported in the specific subsection and on an industry level as currently the definition and the measurement and disclosure is not consistently applied by companies. All data comes from MSCI ESG, one of the global leaders in investment climate impact assessments. It is based on MSCI ESGs database for greenhouse gas emissions of about 8'500 companies, the largest in the market. The database feeds real-time data into the YourSRI tool via an API.

The tool uses the latest consistently available annual greenhouse gas emissions. As GHG emissions are reported until the end of any given year for the previous business or calendar year, the mapping is typically t minus 2. For most comparable results, a matching of annualized greenhouse gas emissions is recommended with year-end holding information."

Impact Methodology

Based on MSCI ESG Sustainable Impact Metrics the Impact Score is designed to identify companies that derive revenue from products or services that address at least one of the major social and environmental challenges defined by the 17 UN Sustainable Development Goals (UN SDGs). Using the UN SDGs as a reference, we grouped the 17 goals into five actionable impact themes:

1. Basic Needs
2. Empowerment
3. Climate Change
4. Natural Capital
5. Governance

The themes are designed to allow institutional investors to measure their exposure to companies providing potential solutions to these challenges.

Under each of the actionable social and environmental impact



themes, MSCI ESG Research has identified specific categories of products and services that it has determined listed companies can offer as potential solutions to environmental and social challenges. This taxonomy of impact solutions draws from MSCI ESG Research's sector expertise, as well as client feedback and discussions with stakeholders including academics, consultants, and civil society through MSCI ESG Research's.

Research Coverage

For the environmental themes, the universe is the MSCI ACWI Investable Market Index (IMI) which includes about 8,500 companies. For the social themes, the universe as of April 2018 is the MSCI ACWI Index, which includes about 2,500 companies. Over the course of 2018, this universe will expand to include the MSCI ACWI IMI.

All companies in the covered universe have a value populated for revenue figures. A revenue figure of zero means we found no evidence of involvement. Companies with blank values are outside the covered universe.

SOURCES for Impact Measurement

MSCI ESG Research uses a wide range of information tools and sources to perform both annual and monthly updates, including:

- Company websites
- Company Annual Reports and regulatory filings
- Direct communication with company

Quality Review

Initial company research and analysis is followed by a rigorous quality review process. Data accuracy and company profiles are peer reviewed and then sent for final approval at MSCI ESG.

Sustainable Impact Taxonomy

Pillar	Themes	Categories
Environmental Impact	Climate Change	1. Alternative energy 2. Energy efficiency 3. Green building
	Natural Capital	4. Sustainable water 5. Pollution prevention
Social Impact	Basic needs	6. Nutrition 7. Major Disease Treatments 8. Sanitation 9. Affordable Real Estate
	Empowerment	10. SME Finance 11. Education

Source: MSCI ESG Research

SUSTAINABLE IMPACT SOLUTIONS COVERAGE

Social Impact research covers the constituents of the MSCI ACWI Index. Environmental Impact research covers the constituents of the MSCI ACWI IMI Index.

REPORT INCLUSION CRITERIA

Companies must generate ≥ 0 percent of revenue from Sustainable Impact Solutions to contribute towards a portfolio's Exposure to Sustainable Impact Solutions Revenue and the Issuer Revenue Generated from Sustainable Impact Solutions. For Portfolio reporting an asset owner looking to 'footprint' an existing portfolio's degree of alignment with Impact/ the SDGs it's best to measure all revenue in all themes from all companies with no other requirements.

PORTFOLIO SUSTAINABLE IMPACT ASSESSMENT

An index or portfolio's Sustainable Impact Assessment is determined by its exposure to Sustainable Impact Solutions Revenue as defined by the MSCI ESG Sustainable Impact Metrics methodology and associated definitions. The classifications are defined by the following table:

Classification	Exposure
Very High ● ● ● ●	> 20%
High ● ● ● ○	> 10% and ≤ 20%
Moderate ● ● ○ ○	> 5% and ≤ 10%
Low ● ○ ○ ○	> 1% and ≤ 5%
Very Low ○ ○ ○ ○	≤ 1%

REVENUE EXPOSURE TO SUSTAINABLE IMPACT SOLUTIONS - CALCULATION

An index or portfolio's exposure to Sustainable Impact Solutions Revenue is the portfolio weighted average of each company's percent of revenue generated by sustainable impact solutions goods and services. To avoid the possibility of overstating revenue exposure, companies outside of the coverage universe are treated as having 0% revenue from Sustainable Impact Solutions.

	Portfolio Weight	Sustainable Impact Solutions Revenue	Contribution to Portfolio Sustainable Impact Solutions Revenue
Company A	50%	20%	10%
Company B	30%	60%	18%
Company C	20%	0%	0%
Total	100%		28%

THE SDGS AS INVESTMENT FRAMEWORK




The UN Sustainable Development Goals, launched in 2015, define 17 goals aimed at solving serious global problems by 2030. The SDGs have caught on with many audiences, including investors, as a framework to identify relevant problems and appropriate solutions. While some investors consider companies' overall degree of operational alignment with the SDGs, the larger focus to date has been on specific products and services, which typically have a greater reach.

MSCI ESG Research's Sustainable Impact Metrics revenue data is based on the problems defined by the SDGs. MSCI has identified five actionable themes that address these problems, with many solutions relevant to more than one of the 17 goals.

By now for the following points are not measurable:

- Access to Energy & Water
- Sustainable Jobs
- Digital Divide
- Diversity Inclusion
- Climate Adaption
- Sustainable Agriculture





Basic Needs

				
Nutrition	Affordable Real Estate	Major Disease Treatment	Sanitation	Access to Energy & Water
SDG: 2	SDG: 3	SDG: 6	SDG: 11	SDG: 6, 7



Empowerment

				
SME Finance	Education	Sustainable Jobs	Digital Divide	Diversity Inclusion
SDG: 8, 10	SDG: 4	SDG: 1, 8	SDG: 9	SDG: 5, 10

Climate Change

			
Alternative Energy	Energy Efficiency	Green Building	Climate Adaption
SDG: 13	SDG: 7, 11, 13	SDG: 11, 13	SDG: 9, 11, 13

Natural Capital

		
Sustainable Water	Pollution Prevention	Sustainable Agriculture
SDG: 6	SDG: 12, 14, 15	SDG: 14, 15