

rfu Sustainability Rating of Sovereigns & Sub-Sovereigns

Methodology Description

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I. Starting Points

A sustainable country or community meets the needs of its citizens and entities and considers other countries within the Planetary Boundaries.

Sovereigns are serving the wellbeing of their citizens by balancing social, economic and ecological targets

Two renowned scientific concepts form the basis of the model

The methodology covers >99% of the world by population and GDP

The objective of the rfu Sustainability Rating of Sovereigns and Sub-Sovereigns is to assess the sustainability performance of countries, states and regions as well as large municipalities. Many of those are issuers of bonds or other debt securities. Further, the methodology provides country-specific information for the rfu Commodity Rating and the rfu Corporate Rating.

Sovereigns & Sub-Sovereigns are serving the wellbeing of their citizens by balancing social, economic and ecological targets while taking into account the interests of neighbouring countries as well as the international community. The rfu Sovereigns & Sub-Sovereigns Rating is based on a large range of research on human wellbeing, Planetary Boundaries as well as on the economic and political conditions for a sustainable development. The holistic understanding of sustainability has been a guiding principle in the conceptual creation of the methodology.

The rfu Sovereigns & Sub-Sovereigns Rating is measuring the performance in the social, economic and ecological dimensions of sustainability. (1) The societal and economic dimensions of the methodology follow the theory of human needs based, among others, on the works of socio-environmental scientists Manfred Max-Neef, Hartmut Bossel and Ian Gough. Needs must be met for people to flourish and to participate in any form of social life. Not satisfying these needs causes serious harm to the individual. Additionally, (2) sustainability is about staying within limits. Therefore, the ecological dimension follows the concept of the Planetary Boundaries. It was developed by a group of scientists in the fields of earth system and environment headed by Johan Rockström at the Stockholm Resilience Centre.

The rfu Sovereigns Rating, in its basic structure, was devised in 2016. Since then, it has been extended several times. It now covers more than 160 countries. Also several hundred of Sub-Sovereigns are covered according to their relevance as bond issuers.



II. Basic Structure

The rfu Sovereigns Rating follows a holistic and comprehensive approach based on the three pillars of sustainability.

Three pillars of sustainability

The rfu Sovereigns Rating follows the logic of strong sustainability and systemic interdependence along three dimensions. (1) Social: Human wellbeing basics define the normative goal, ensuring the universal fulfilment of human needs. Are the political, institutional and material structures of a country enabling a sustainable satisfaction of basic needs? (2) Economy: Governance and Economic Systems provide the institutional and distributive structures through which wellbeing is achieved. Does a country provide the means for the satisfaction of its population's needs? (3) Ecology: Ecological Boundaries form the biophysical foundation – human societies cannot operate safely beyond these limits. Does a country operate within its fair share of the Planetary Boundaries?

In rfu research approach, ecology is fundamental, wellbeing is the purpose, and economic-governance systems are the means.

Hierarchical structure of the model

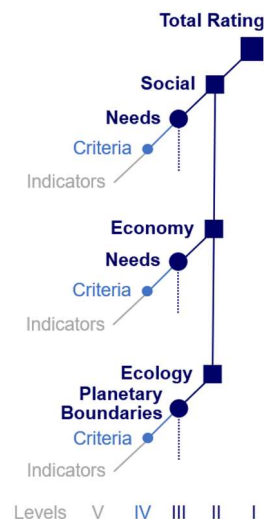
The rfu Sovereigns Rating has the following hierarchical levels: The total rating (Level I) is an aggregation of the three dimensions Society, Economy and Ecology (Level II). On Level III, the social and economic dimension each are broken down into eight clusters of needs and the ecological dimension into nine Planetary Boundaries. The criteria (Level IV) and concrete indicators (Level V) are then assigned to these.

Sub-Sovereigns Rating based on regional socio-economic information

Based on the rfu Sovereigns Rating a methodology to assess sub-sovereign entities, such as federal states, cities and municipalities was created.

The structure is identical to the rfu Sovereigns Model. The starting point for the rfu Sub-Sovereigns Rating is the rating of the respective country. At Level III, ratings are systematically adjusted by applying, if available, regional socio-economic information.

Structure & Levels of the rfu Sovereigns Rating



III. Criteria, Weighting & Rating

Structured assessment of sustainability through a multitude of criteria for human needs & Planetary Boundaries leads to ratings on a nine-tier scale.

The social dimension evaluates social wellbeing and needs satisfaction

The economic dimension evaluates the quality, stability and effectiveness of governance and economic systems

Clusters of needs and related questions

The social dimension evaluates whether basic conditions are in place for a population to have a dignified, safe and self-determined life. This dimension forms the inner boundary of a sustainable society – parallel to the “social foundation” in Doughnut Economics.

The economic dimension represents the structures through which societies organise resources, rights and responsibilities. It is the link between the social and the ecological dimension. A sustainable economy enables the efficient and sufficient provisioning, use and distribution of social, economic as well as ecological resources to satisfy universal needs of present and future inhabitants. This requires a stable and resilient economic system, a good governance and a fair interaction with other countries.

The social as well as the economic dimension is organised along seven clusters of needs. These range from existence and security to fields of other universal needs that are required for human flourishing like effectiveness or co-existence. Existence, for example, measures – on the intermediary level – the satisfaction of the most basic material needs like health, nutrition and poverty. The need ‘environmental justice’ represents the link to the ecological dimension. In total, more than 60 individual indicators contribute to the social rating. The economic dimension follows the same structure. Via resource efficiency – it is also linked to the ecological sphere. The number of assigned indicators is more than 50.

Needs	Research questions: social issues	Research questions: economic issues
Existence	Are the most basic material needs met?	Are the provisioning systems ensuring that the basic material needs are met?
Security	Is the individual physically safe in the country?	Are conditions ensured for physical security and local and global peaceful co-existence?
Adaptability	How adaptable is the individual to socio-cultural, technological, and economic challenges?	How adaptable is the country regarding ecological and economic challenges?
Effectiveness	How effectively can the individual use its potential?	How politically stable and financially resilient is the country?
Co-existence	How do the individuals interact with others?	How fair and equal are income and wealth distributed within the country and does the country foster fair economic relations?
Psychological Needs	Are the psychological needs of the individual satisfied?	Does the country provide conditions that satisfy psychological needs?
Environmental Justice / Resource Efficiency	How are human-induced environmental impacts distributed locally and globally?	To which extent are social needs satisfied within the planetary boundaries?

The ecological dimension evaluates to what extent Planetary Boundaries are strained

The ecological sphere provides information about the stress that a country is putting on the Planetary Boundaries. Operating within a country’s fair share is a condition to satisfy the needs of present and future generations.

Structure of the rfu Sovereigns Rating: social dimension with example criteria



Structure of the rfu Sovereigns Rating: economic dimension with example criteria



Planetary Boundaries and related questions

Planetary Boundaries	Research questions: ecological issues
Climate Change	What is the country's impact on the human-induced climate crisis?
Biosphere Integrity	What are the country's impacts on biodiversity?
Land System Change	How does land use impact biophysical processes?
Biochemical Flows	What are the impacts on phosphorus and nitrogen cycles?
Atmospheric Aerosol Loading	To what extent does the country contribute to the emission of small particles?
Stratospheric Ozone Depletion	Does the country contribute to the depletion of the ozone layer lowering the filtering of ultraviolet radiation from the sun?
Ocean Acidification	How far does the country contribute to the decrease in oceans' pH-value?
Freshwater Use	Which impact does a country have on freshwater systems?
Novel Entities	How many novel substances with potentially unwanted geophysical and biological effects are emitted?

Weighting structure on Level II is depending on development status

Scoring from +10 to -10 and transformation on an absolute 9-tier rating scale from A+ to C-

The 4 rfu Sustainability Categories follow the distribution

For Sub-Sovereigns data is selected based on sphere of influence

The ecological assessment is derived from two perspectives: environmental effects within the state's physical borders (production-based) and those through the consumption by a state's inhabitants including trade (consumption-based). Overall, more than 60 indicators are applied.

The ecological dimension is structured along the nine Planetary Boundaries.

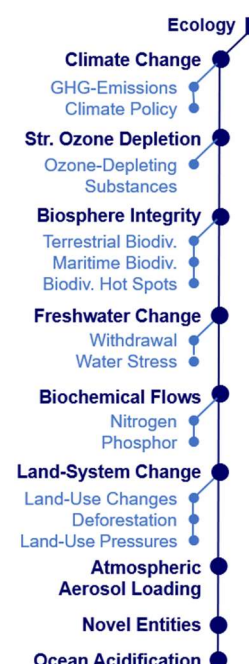
For developed countries with a disproportionately high ecological footprint, the environment accounts for about 43% of the total rating. The economic and social sphere each make up for 29%. For other countries, all three dimensions are weighted equally at 33%. Within the social and economic dimension almost all needs are equally weighted, the weightings within the ecological sphere are based on the extent of transgression of the Planetary Boundaries.

Each criterion is assessed on a scale from +10 to -10, as is the aggregation at Level III and Level II, as well as into an overall rating. This score is ultimately transformed into a rating on the nine-tier scale from A+ to C-. In case of limited data an indicative rating from a to c will be given. This scale is identical to those in all other rfu Rating Methodologies. This means findings are transferable between them. For example, a rfu Sovereigns Sub-Rating is an input for the rating of a corporation operating in that country.

The entirety of the total ratings is distributed according to a profile similar to a bell curve. The rfu Sustainability Categories are derived from the distribution of the results. They are approximately as follows: (i) Qualified (Q) represents approximately the best quarter of all countries, (ii) Medium Profile (MP) is the second-best category, and (iii) Low Profile (LP+) and (iv) LP- are made up of below-average countries. Depending on the individual threshold set by the user, the rfu Sustainability Category determines the investability.

The weightings and ratings scale for Sub-Sovereigns are the same as for Sovereigns. Regarding criteria, only those are selected for Sub-Sovereigns that are in their sphere of influence.

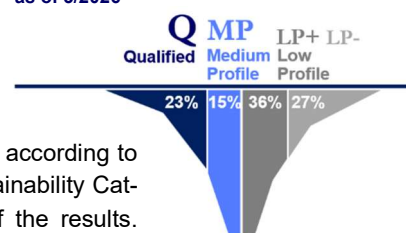
Structure of the rfu Sovereigns Rating: ecological dimension with example criteria



Scoring & Rating Scale

+10	+8	+6	+4	+2	0	-2	-4	-6	-10
A+	A	A-	B+	B	B-	C+	C	C-	
a				b	c				
ab			ba		bc				

Sustainability Categories & Distribution as of 3/2026



IV. Exclusions

Requirements of important ESG labels comprised in rfu Exclusion Standard. Other external or individual exclusions can be implemented.

What is fundamentally incompatible with the principles of sustainability?	Exclusion criteria cover frameworks and practices that are incompatible with the principles of sustainability. Sustainable investors and asset managers generally base their exclusion policies on established external standards and market conventions.	
As a convenient solution for users, the rfu Exclusion Standard covers common exclusion catalogues	Therefore, rfu research has pooled requirements of important labels in the rfu Exclusion Standard. This covers (i) the Austrian Ecolabel for Sustainable Financial Products (UZ49), (ii) the FNG Label for sustainability funds and (iii) the ÖGUT Label for Austrian retirement funds (Vorsorge- and Pensionskassen). The rfu Exclusion Standard rids users of the time-consuming work of detailed operationalisation of these standards in databases.	Criteria in the rfu Exclusion Standard Defence - Defence budget >4% of GDP over the last 3 years - ABC weapons & other controversial weapons - Aggressive warfare  Nuclear Energy - Share of nuclear energy >40% over the last 3 years - New NPP under construction or planned  Major democratic Deficiencies - Freedom House Index "not free"  Major human Rights Deficiencies - Execution of the death penalty in the last decade - Non-participation in the relevant human rights conventions - Actual poor human rights situation  Corruption - Corruption Perception Index <30  Financial Sanctions - Blacklisted by FATF (Financial Action Task Force) - On the EU list of non-cooperative countries for tax purposes  Insufficient Climate Protection - Non-signatory of the relevant climate protection agreement (Paris) - GHG emissions of >14t per capita  Insufficient Protection of Biodiversity - Non-signatory of the UN Biodiversity Convention - Non-signatory of the Washington Convention on Species Protection 
Additional standards to choose from and client-specific exclusions	However, other standards, e.g. for faith-based investors (such as the FinAnKo criteria, the Guidance of the German Bishops' Conference, Guideline for Ethically-Sustainable Investment in the German Protestant Church) and individual criteria catalogues of institutional investors can be implemented.	
Exclusion criteria for Sub-Sovereigns	On the Sub-Sovereigns level, only those exclusion criteria are applied that are within the responsibility of the rated federal states, cities and municipalities. For example, the regional GHG emissions are apportioned to the sphere of Sub-Sovereigns and can lead to an exclusion. On the other hand, e.g. defence policies are typically solely in the power of the Sovereign and do not affect the Sub-Sovereign level.	
	Therefore, a Sub-Sovereign analysis starts at the individual sphere of influence, particularly in countries where exclusion criteria are violated. For example, the death penalty in the US is determined on the State level while e.g. in Japan it is not in the remit of the individual prefectures.	

V. Processes, Sources & Documentation

A broad spectrum of reliable sources is applied in the research & rating process which is certified according to ISO9001.

Comprehensive data
from systematic
sources

Data is extracted from reliable sources available in regularly updated form and with as wide an international coverage as possible. These requirements are mainly fulfilled by data sets of large international organisations (e.g. WHO, OECD, UNO, World Bank, ILO, EU) as well as information and indices from scientific bodies and NGOs (e.g. Transparency International, SIPRI, Climate Watch). The indicators get reviewed every two years when the rating is updated.

Analyses are updated
every 2 years

The dynamics of change in the sustainability status of Sovereigns & Sub-Sovereigns are relatively slow for many aspects. Changes are more likely to be seen in the medium term. The analyses and ratings are updated every two years. Exclusion criteria and major political developments are observed annually.

Quality management
and ongoing optimisation
of the methodology

The research processes at rfu are subject to a quality management system certified according to ISO 9001. Corresponding process descriptions, quality indicators and continuous improvement processes (CIP) also exist for Sovereigns and Sub-Sovereigns research. At the methodology level, this includes the ongoing collection of experiences and feedback and regular optimisation of the methodology. However, changes to the methodology are executed with care so as to maintain the comparability of historical ratings wherever possible.

Documentation of data
and ratings as well as
Rating Summaries and
Reports

The internal documentation includes the complete data sets for Levels I to V, consisting of raw data, scores, ratings and weightings. Brief descriptions for external users can be found in Rating Summaries. In-depth information and interpretation is included in comprehensive Rating Reports which are created on demand.



VI. Regulatory Disclosure

As a small ESG Rating Provider rfu research falls under EU Regulation 2024/3005 article 5, supervised by ESMA.

General information

As a small ESG Rating Provider rfu research falls under EU Regulation 2024/3005 article 5, supervised by European Securities and Markets Authority (ESMA).

rfu research developed the Sustainability Rating Methodologies for the following asset classes: (i) Corporates, (ii) Sovereigns & Sub-Sovereigns and (iii) Commodities. In addition, rfu is applying customer-specific external rating methodologies to third-party portfolios. rfu research offers this service as “rfu Sustainability Portfolio Controlling”.

The rfu Sustainability Rating Methodologies are based on the “three pillar model” of sustainability, consisting of ecological, social and economic dimensions. As for “governance”, it is an overarching theme within the rfu Sustainability Methodologies, not to be separated from the other pillars.

Reviews of methodologies

While some of these methodologies are undergoing a revision at a regular two-year interval, some are reviewed and updated when necessary. There are regular reviews in place with feedback from analysts as well as outside stakeholders and based on regulatory and other external inputs. If a review shows that changes are necessary, a new version of the methodology is drawn up and published online on www.rfu.at.

The name and number of the latest version can be found in the appendix of each rating methodology document.

The rfu Sustainability Rating Methodologies have been tried and some of them have been tested for over two decades. They have been applied a few thousand times. Where applicable, they are based on scientific models from the fields of social, economic and ecological sciences, ethics, etc.

For the specific scientific basis for this methodology see Chapter II.

The mathematical structure behind the rfu Sustainability Rating Methodologies is based on rfu research’s proprietary design. It has been reviewed and optimised over the last years. Any identified or potential shortcomings are addressed by various lines of defence such as four-eye controls, regular feedback sessions as well as a certified quality management.

Quality Management

The robust quality management system for the rfu Sustainability Ratings has been certified under ISO 9001. The processes have been certified under this label since 2019 and are audited externally on an annual basis by Quality Austria.

Basic assumptions

The holistic rating approach applied by rfu research is focused on impacts that the respective entity or item is causing. In addition, some criteria can have also the characteristics of economic risk indicators. In this regard

Ratings

rfu research's robust and holistic approach follows a double materiality perspective and differs from pure ESG risk ratings.

The industry classification used by rfu research is derived from established sector structures and further adapted by rfu research. Sovereign issuers are classified according to their economic development status.

For details on the rfu Sector Structure see Chapter III of the rfu Corporate Rating Methodology.

The rfu Sustainability Methodologies are covering a multitude of external standards. Current regulatory developments are observed and taken into consideration.

The ratings issued by rfu research are focused on an entity's or item's current status. If relevant the short-term past and future prospects are included in the analysis.

In most cases, the ratings are considered valid for a two-year period, if no significant changes occur in the interval.

In all rfu Sustainability Models, the individual criteria are assessed on a scale between -10 to +10. Their specific weighting is then included in an overall score. The features of the criteria will, over several levels, be aggregated to one overall rating on a nine-part scale from A+ ("proactive") to C- ("negative"). In case of a restricted amount of data a so-called indicative rating from a to c will be given. The rfu Rating Scale is absolute and not aligned with the best-in-class approach. This means the entirety of the rfu Corporate and Sovereigns ratings is distributed according to a profile similar to a bell curve.

For details see Chapter III in this Methodology.

All ratings issued by rfu research are reflecting the opinion of rfu research.

The rating is based on subjective models and interpretations of the analyst entrusted with the rating. The rating is no recommendation for the purchase or sale of the securities of the rated items or entities.

Under the current regulation, rfu research is required to request that rated entities and users publish a link to the rfu research Rating Methodologies alongside rfu Sustainability Ratings they are making publicly available

Data

For the application of the rfu Sustainability Rating Methodologies the following publicly available data is used: published by the analysed entity (especially in sustainability and annual reports), other publicly available data published e.g. by the media, academics, international organisations, NGOs, industry associations etc. In some cases, rfu research additionally gathers information directly from the analysed entities, e.g. via questionnaires or interviews.

Industry and regional averages are sometimes applied as a basic value which is then adjusted to mirror the individual specifics of a rated entity or item.

For more specifics see Chapter V of this Methodology.

In the course of each rating, the most current data for each entity or item is used. If necessary historical data used is being revised.

The majority of the data is collected from reliable sources (see above). Certain and qualitative information in particular is subject to a plausibility check by the analysts during each rating. Unreliable information or data proven to be wrong is not used in the analysis. In the case of insufficient data the entity or item receives a “No Rating”.

Data quality as well as assessments of entities or items are subject to a four-eye principle. The second person involved in the rating process is subject to the same confidentiality requirements as the rating analyst.

As part of rfu research’s regular inter-rating-cycle exclusion checks it is determined whether rated entities are in breach of any exclusion criteria. An irregular rating update would occur, if there is new information with potentially significant positive or negative impact on the rating.

Artificial Intelligence

The use of artificial intelligence (AI) at rfu research will always be strictly confined and limited to data extraction. All rfu Sustainability Rating Methodologies will remain based on the principle of an analyst’s assessment.

To ensure the data extraction is limited to reliable sources, rfu research has developed its own proprietary AI data extraction tool. It does not generate new information but strictly identifies and extracts data contained within the source materials, thereby eliminating the risk of hallucination.

The rfu AI system has been custom-developed for this purpose and operates autonomously on user-uploaded documents only. To further mitigate residual risks and ensure data reliability, a secondary quality control mechanism is implemented in the form of a confidence level indicator. If the confidence level falls below a predefined threshold, the extracted data must be reviewed, validated and if necessary corrected manually by the analyst. The rfu AI system does not influence analytical judgments or rating outcomes.

Current limitations and risks associated with the use of AI include potential misinterpretation of complex or ambiguous disclosures and variability in document formatting. These risks are mitigated through the described confidence threshold mechanism and mandatory human verification.

Conflicts of Interest

rfu research is carefully considering and monitoring conflicts of interest among its analysts. On an annual basis, each analyst has to sign a statement confirming that any potential conflicts of interest have been disclosed.

rfu research has registered as a small ESG Rating Provider under EU Regulation 2024/3005 Article 5 and supervised by the European Securities and Markets Authority (ESMA).

VII. About rfu research

Austria's specialist for sustainable investment with a focus on niche asset classes and market segments.

rfu research specialises
in the ESG assessment
of niche asset classes

rfu research, based in Vienna and founded in 1997, is Austria's specialist for sustainable investment. With an experienced team of 13 employees, we support institutional clients in the development and implementation of sustainability-oriented investment strategies.

A particular focus of our work is the coverage of asset classes and market segments for which there has previously been no or only insufficient coverage with ESG research.

Imprint

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Appendix

Version history

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