

The FEEM Sustainability Index (FEEM SI) is an aggregate index able to provide a synthetic assessment of the overall sustainability of world countries in the form of sustainability rankings. The FEEM SI is a composite work characterized by four main construction steps, each of them featuring novel techniques and up-to-date methodologies to enhance its explanatory potential. Built from a selection of over-arching indicators chosen among the most well-known and reliable international datasets, the FEEM SI manages to uniquely condense the information included in each of its components, using a non-linear aggregation methodology that exploits all the interactions across indicators. Rooted in a dynamic computable general equilibrium model - ICES SI (Intertemporal Computable Equilibrium System) - the indicators of the FEEM SI are projected over time to produce the aggregate index until 2020 and to factor into the analysis specific policy assumptions, in order to quantify their effect on the overall sustainability of countries.

- A Selection of indicators**
indicators are selected from a survey of existing literature starting from reliable international sources in order to construct a thorough and comprehensive indicator set
- B Modeling framework**
indicators are constructed in a dynamic computable general equilibrium model and projected over time so as to be able to study sustainability in the future
- C Normalisation**
indicators are normalised to a 0-1 scale following a policy-oriented benchmarking procedure in order to achieve full comparability between indicators
- D Aggregation**
indicators are aggregated with an innovative non-linear aggregation procedure which gives a unique measure of sustainability comparable across countries and over time

Visit us at www.feemsi.org to explore the potential of the FEEM SI.



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FEEM SUSTAINABILITY INDEX



THE INDICATORS OF THE FEEM SI

The FEEM Sustainability Index is composed of the following indicators, which are arranged in the logical framework of the indicators tree below.



ECONOMIC

Gross domestic product per capita (GDP per capita): measure of national wealth in standard economic terms.
Consumption expenditure: consumption share of GDP (demand side of GDP), assessment of household welfare.
Research and development (R&D): investment in innovation over total GDP.

SOCIAL

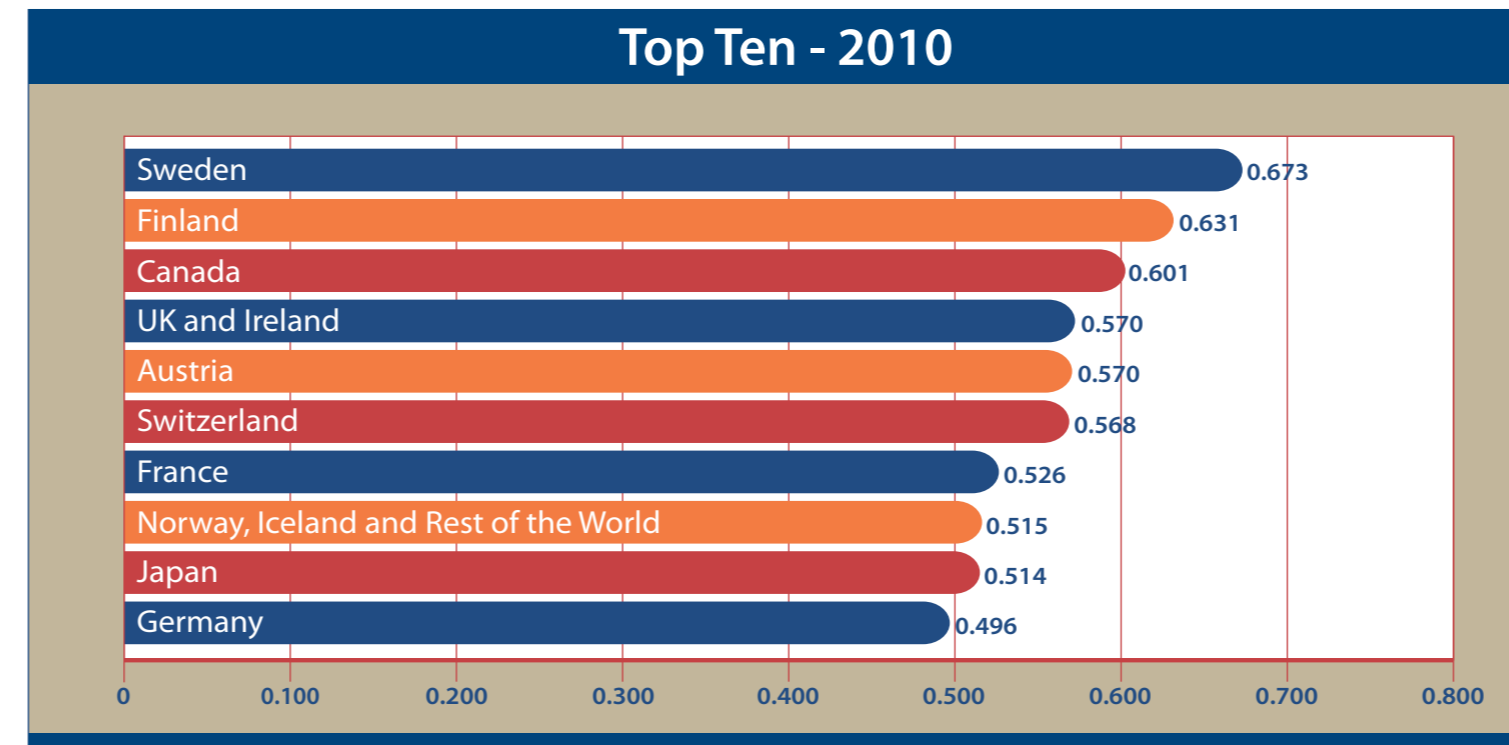
Growth rate of population: annual rate of population growth, degree of pressure on the resources of a country.
Food relevance in primary consumption: proportion of national expenditure in primary goods spent on food, proxy for a poverty indicator according to the Engel law.
Energy per capita: amount of energy consumed per capita, measure of degree of connection to energy systems and potential under- or overuse.
Expenditure in insurance and pensions: private expenditure on healthcare, insurance, and complementary pension as share of GDP.
Public expenditure in education: share of education expenditure of GDP, measure of the degree of investment on education.
Health expenditure by private entities: share of private expenditure on total health expenditure, balance between public and private expenditure.
Overall health expenditure: GDP share of expenditure in healthcare including public and private.

ENVIRONMENTAL

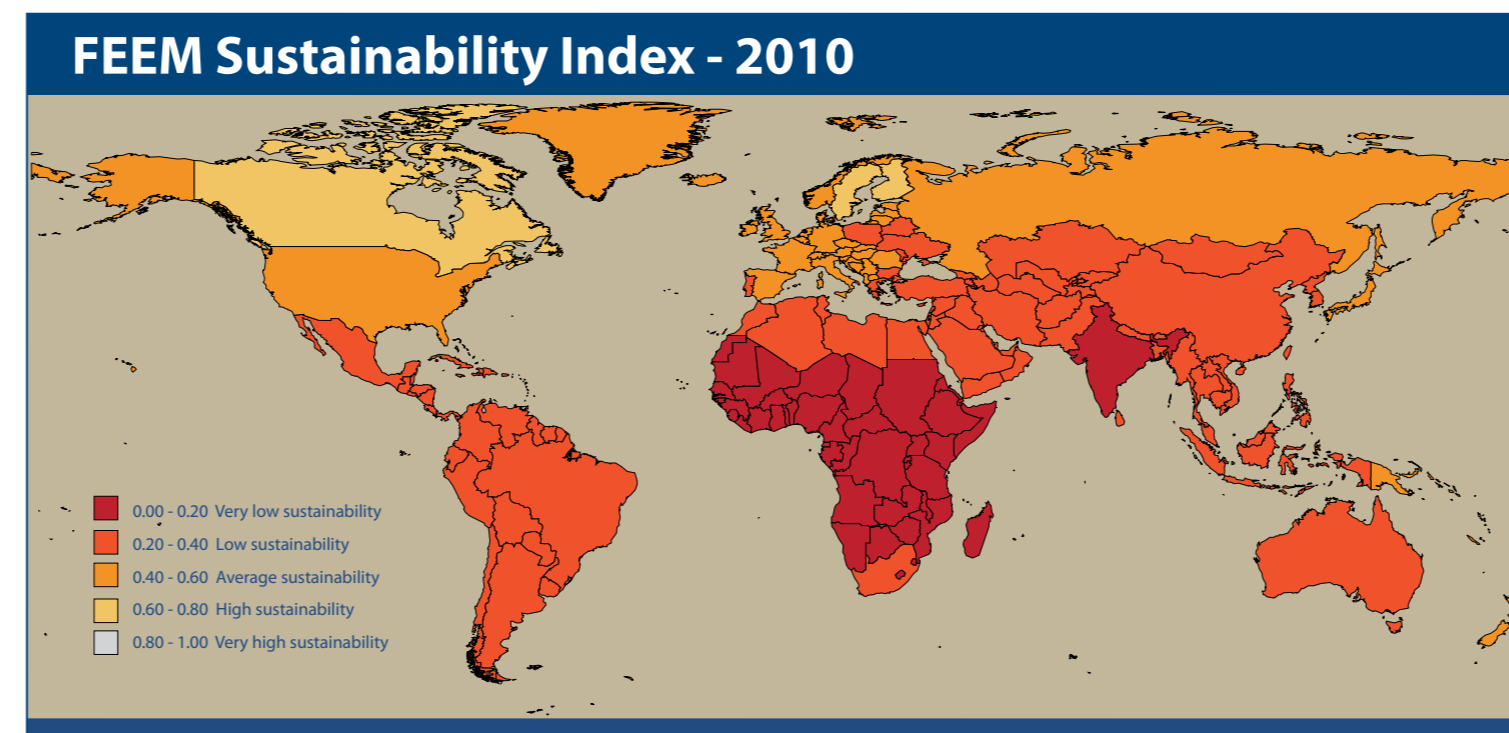
CO₂ intensity of energy: carbon content per unit of energy consumed, degree of efficiency in energy production.
Greenhouse gas emissions per capita: level of GHG emissions (CO₂, NO₂, CH₄) per capita.
Energy intensity: energy use per unit of GDP, degree of efficiency in energy use.
Imported energy: share of imported energy, measure of energy security.
Clean energy: share of clean energy (non-carbon) on total energy consumed.
Use of renewable water resources: water use over total available renewable water resources.
Biodiversity index of plants: share of endangered plant species over total plant species.
Biodiversity index of animals: share of endangered animal species over total animal species.

RESULTS AND POTENTIAL OF THE FEEM SI

The FEEM SI provides sustainability rankings for each year of the analysis, allowing the immediate identification of the most sustainable countries. The FEEM SI scores allow checking the relative performances of different countries and understand the size of the sustainability gap among different countries.



The FEEM SI ranking results for each year can be checked through easy-to-interpret colour-coded FEEM Sustainability Maps, which provide a synthetic overview of world sustainability in a given year of the analysis.



The ability to predict indicators over time contributes to make the FEEM SI much more than a simple assessment tool, extending its potential as a real policy simulation environment. In fact, countries can be monitored through the years detecting the time profile of the effects of policies and giving a synthetic overview of how sustainability ranking evolves over time. In the following table the FEEM SI is used to compare the baseline scenario with a policy aimed at improving all the dimensions of sustainability (SD Policy).

Rank	Baseline 2020	SD Policy 2020	Change	Rank	Baseline 2020	SD Policy 2020	Change
1	SWE	SWE	= 0	21	RoE	BUL	↓ -1
2	FIN	FIN	= 0	22	PRT	RoE	↓ -5
3	CAN	CAN	= 0	23	ESP	ARG	↓ -2
4	AUT	JPN	↓ -1	24	ARG	POL	↑ 1
5	UKI	AUT	↓ -3	25	GCM	ESP	↓ -5
6	CHE	CHE	= 0	26	TUR	TUR	= 0
7	FRA	FRA	= 0	27	BUL	PRT	↑ 6
8	NIR	UKI	↓ -3	28	ZAF	SEA	↓ -3
9	JPN	GER	↑ 5	29	POL	RoAsia	↑ 5
10	GER	DNK	↑ 1	30	MEX	GCM	↓ -2
11	NZL	NIR	↓ -3	31	SEA	ZAF	↑ 3
12	DNK	USA	↑ 2	32	MEast	MEX	↓ -1
13	BNLX	BNLX	= 0	33	RoAsia	MEast	↑ 4
14	RUS	NZL	↓ -3	34	RoLA	RoLA	= 0
15	ITA	RoEU	↓ -1	35	RoFSU	CHN	↓ -1
16	USA	ITA	↑ 4	36	IDN	RoFSU	↓ -1
17	RoEU	RUS	↑ 2	37	CHN	IDN	↑ 2
18	BRA	AUS	↓ -1	38	NorthAfr	IND	↓ -1
19	Baltic	BRA	↓ -1	39	IND	NorthAfr	↑ 1
20	AUS	Baltic	↑ 2	40	AFR	AFR	= 0

AFR: African countries except Northern Africa and South Africa; **ARG:** Argentina; **AUS:** Australia; **AUT:** Austria; **Baltic:** Estonia, Latvia & Lithuania; **BNLX:** Benelux; **BRA:** Brazil; **BUL:** Bulgaria; **CAN:** Canada; **CHE:** Switzerland; **CHN:** China & Hong Kong; **DNK:** Denmark; **ESP:** Spain; **FIN:** Finland; **FRA:** France; **GCM:** Greece, Cyprus & Malta; **GER:** Germany; **IDN:** Indonesia; **IND:** India; **ITA:** Italy; **JPN:** Japan; **MEast:** Middle East; **MEX:** Mexico; **NIR:** Norway, Iceland e Rest of the World; **NorthAfr:** North Africa; **NZL:** New Zealand; **POL:** Poland; **PRT:** Portugal; **RoAsia:** Rest of Asia; **RoE:** Rest of Europe; **RoEU:** Rest of European Union; **RoFSU:** Rest of Former Soviet Union; **RoLA:** Rest of Latin America; **RUS:** Russia; **SEA:** South East Asia; **SWE:** Sweden; **TUR:** Turkey; **UKI:** United Kingdom & Ireland; **USA:** United States of America; **ZAF:** South Africa