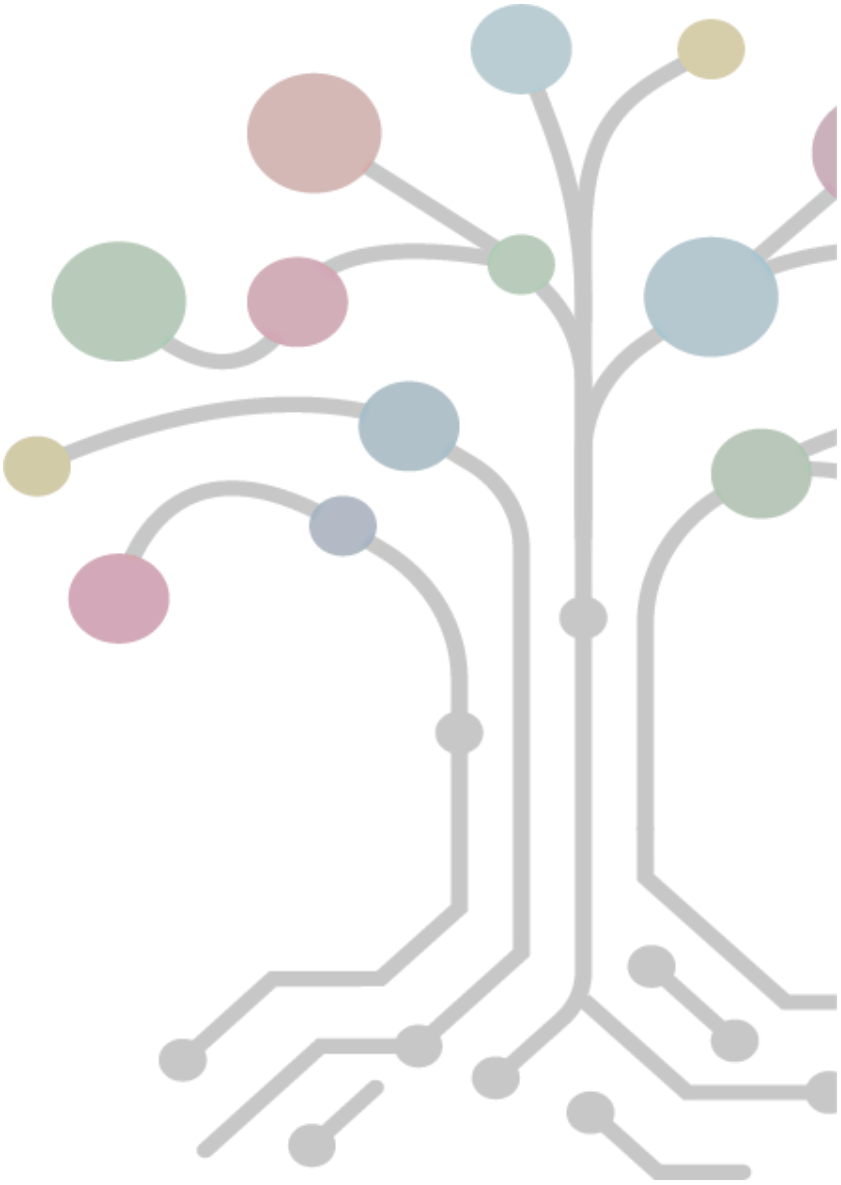
DREAMS
dreamsproject.dk

Assessing the Sustainable Development Goals in Environmental Assessment

2023



Colophon

Title:	Assessing the Sustainable Development Goals in Environmental Assessment
Year of publication:	2023
Published by:	The Danish Centre for Environmental Assessment (DCEA), Aalborg University
Responsible institution:	The Danish Centre for Environmental Assessment (DCEA), Aalborg University
Authors:	Emilia Ravn Boess & Lone Kørnøv
Reviewer:	Maria Rosário Partidário
Financing:	The report is financed by Innovation Fund Denmark (Grant agreement 0177-00021B DREAMS).
Figures and illustrations:	See reference list and in-text citations
Internet version:	The report can be found at: https://dreamsproject.dk
Keywords:	Sustainable Development Goals, Environmental Assessment
Copyright:	The report can be freely cited with reference.
ISBN PDF:	978-87-93541-56-6
Version:	1.0
Disclaimer:	The report and its contents are an expression of the authors' knowledge and conclusions and does not necessarily represent all DREAMS consortium partners.

Table of Contents

Introduction

This report collects various examples of how various contexts have assessed the SDGs. It draws examples from environmental assessment (EA) where possible. The report is intended to provide a catalogue of methods as inspiration for how a measurement of SDGs can be approached and perhaps draw from some of these examples as a guide for integrating SDGs in an EA context.

The different approaches to SDG assessment that are addressed in this report are summarized in Table 1.

Table 1: Methodological approaches to the assessment of SDGs as explored in this report.

Methodological approach	*Description*	*Corresponding examples*
Determining direct & indirect influence	The breadth of influence that the object of assessment has on SDGs is shown by determining both direct and indirect influence. This is done for both positive and negative impacts.	*Rambøll's SDG Impact Assessment Tool* *Gothenburg Centre for Sustainable Development SDG Impact Assessment Tool*
Contributing to or delaying fulfillment	It is determined whether the object of assessment contributes positively towards eventually fulfilling the SDGs, or delays the process, without establishing a measurable threshold for fulfillment.	*Copenhagen Metro EIA for the City Ring (2008)*
Measuring fulfillment of the SDGs	The focus of assessment is determining the extent to which the object of assessment fulfills the SDGs, according to a measurable threshold for fulfillment.	*SDG index*
Measuring distance to fulfillment	The focus of assessment is determining how far the object of assessment is from fulfilling the SDGs, according to a measurable threshold for fulfillment.	*OECD Measuring Distance to the SDG Targets 2019* *OECD The Short and Winding Road: Measuring Distance to the SDG Targets*
Identifying progress/trends	The trend of the object of assessment in fulfilling SDGs is determined over a certain time span to indicate whether the trend is progressing or delayed.	*SDG index* *Sustainable Development in the European Union (2022)*

Comparing performance of two entities	Two or more objects are assessed up against the SDGs (considering influence, fulfillment, alignment, etc.) and the results are then compared to one another.	COWI EIA for the Stormburst tunnel, Svanemøllen

This report does not intend to declare best practice and also does not delve into a discussion of advantages and disadvantages associated with each measurement type. It merely demonstrates examples found in practice along with various ways to visualize and thereby communicate SDG measures.

Determining direct and indirect influence

Examples

Rambøll's SDG Impact Assessment Tool

Gothenburg Centre for Sustainable Development SDG Impact Assessment Tool

One form of measurement is distinguishing between direct and indirect impact that an object of the assessment, in this case of EA, the impacts from the project/plan, has on the SDGs. This form of assessment recognizes that the SDGs are interconnected and that there are different degrees of impact.

Rambøll's SDG Impact Assessment Tool

The authors have not yet found examples from the context of EA, but there are tools in other contexts, such as Rambøll's SDG Impact Assessment Tool (Rambøll) in which a user answers a questionnaire that identifies direct and indirect impact that a company has on the SDGs. The questionnaire is aimed at production companies and impact is based on whether there are company policies in place to improve conditions addressed in the SDGs. The results are displayed as shown in Figure 1, in which the solid goals are directly impacted by business activities and the partially colored goals are indirectly impacted.

Figure 1: Rambøll's SDG Impact Tool results. (Rambøll).

Gothenburg Centre for Sustainable Development *SDG Impact Assessment*

Similarly, the Gothenburg Centre for Sustainable Development has developed an SDG Impact Assessment Tool (Gothenburg Centre for Sustainable Development), also based on a self-evaluation. It entails determining whether the company influences the SDGs through direct/indirect positive/negative impact, no impact, or whether more knowledge is required to determine assessment. The tool requires you first to sort the SDGs according to relevance and thereafter assess the relevant SDGs and explain the reasoning for the assessment. The results are displayed in Figure 2.

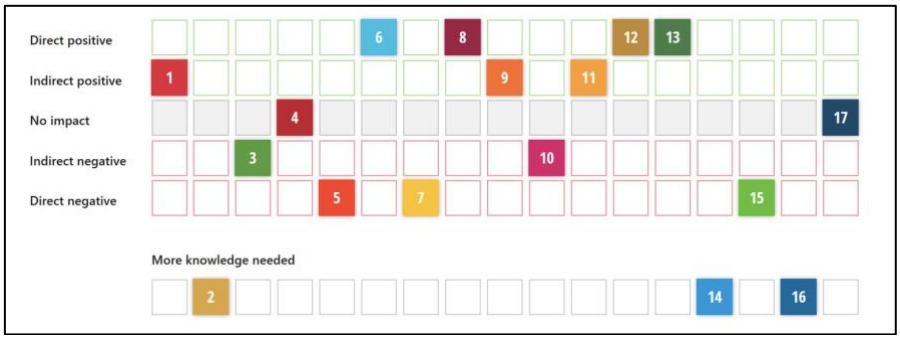


Figure 2: SDG Impact Assessment Tool developed by (Gothenburg Centre for Sustainable Development).

Contributing to or delaying fulfillment

Examples

Copenhagen Metro EIA for the City Ring (2008)

This assessment approach determines whether the object of assessment contributes positively towards eventually fulfilling the SDGs, or delays the process, without establishing a measurable threshold for fulfillment. Thus, a 'fulfillment' threshold is essentially unknown, meaning that the assessment is entirely reliant on qualitative measurements towards a subjective 'fulfillment'.

This is the primary approach for SDG measurement in EA contexts and below are some examples drawn from EA reports. In its most common form, contribution towards fulfillment is expressed as a positive impact, delaying fulfillment is expressed as a negative impact and no impact is expressed as neutral.

Copenhagen Metro EIA for the *City Ring (2008)*

One example is from an exercise performed through the DREAMS project in which an EIA of The City Ring (Cityringen) (Copenhagen Metro (Metroselskabet) 2008) in Copenhagen, Denmark from 2008 was revisited after publication to retroactively determine how the impacts would influence SDG targets. The exercise linked predicted impacts to relevant SDG targets and thereafter, went on to assess whether the impact would be negative, positive, or neutral. The example provided (Figure 3) demonstrates impacts on SDG 3: Good health and well-being and SDG 15: Life on land as well as select targets. The exercise also included mitigation measures and indicated how these measures would change the assessment, in terms of less negative, neutral, or positive impact.

Assessments of impacts

target	phase	activity	assessment
SDG 3: Good health and well-being			
3.4	construction	Decreased access to public spaces and recreational areas	negative
		Increased impacts from noise and vibrations	negative
	operation	Reduced noise and vibrations from closing of bus routes	positive
3.6	construction	Traffic diversion	negative
	operation	Reduction of bus and car traffic	positive
3.9	construction	Occurences of air, water and soil pollution	negative
	mitigation	*Management of contaminated soil*	*neutral*
	mitigation	*Purification and treatment of contaminated water*	*neutral*
	operation	Reduced air pollution from reduction of bus and car traffic	positive
SDG 15: Life on land			
15.2	construction	Cutting down of trees	negativ
	mitigation	*Replanting trees*	*less negative*

Figure 3: Determining impact on SDGs 3 and 15 in terms of impacts described in the EIA of the City Ring (Cityringen) (Copenhagen Metro (Metroselskabet) 2008).

Measuring fulfillment of SDGs

Examples

SDG index – country fulfillment of SDGs

Another approach is to quantitatively measure fulfillment, in which 'fulfillment' can be described by a tangible threshold. This can be done by measuring how far one has come from a baseline towards a threshold. It requires the quantitative indicators in order to be able to measure to what extent the SDG is fulfilled.

SDG index – country fulfillment of SDGs

The SDG index (Sachs et al. 2022) is a global attempt to measure national status and progress on meeting the SDGs. The report employs several methods for measuring, but a majority builds on how the country performs based on quantitative indicators, a sample of which can be seen in Figure 4. Here, performance on indicators determine the extent to which the country performs on the individual goals (the chart shown in Figure 5). For a more detailed description of the methods for assessment, see Sachs et al. (2022). This report represents fulfillment through percentages, i.e., Denmark has fulfilled 85.6% of the SDGs.

SDG1 – No Poverty		Value	Year	Rating	Trend
Poverty headcount ratio at $1.90/day (%)		0.2	2022	●	↑
Poverty headcount ratio at $3.20/day (%)		0.2	2022	●	↑
Poverty rate after taxes and transfers (%)		6.4	2018	●	↑
SDG2 – Zero Hunger					
Prevalence of undernourishment (%)		2.5	2019	●	↑
Prevalence of stunting in children under 5 years of age (%)	*	2.6	2019	●	↑
Prevalence of wasting in children under 5 years of age (%)	*	0.7	2019	●	↑
Prevalence of obesity, BMI ≥ 30 (% of adult population)		19.7	2016	●	↓
Human Trophic Level (best 2–3 worst)		2.5	2017	●	↓
Cereal yield (tonnes per hectare of harvested land)		4.9	2018	●	↑
Sustainable Nitrogen Management Index (best 0–1.41 worst)		0.4	2015	●	→
Yield gap closure (% of potential yield)		74.1	2018	●	●
Exports of hazardous pesticides (tonnes per million population)		99.3	2019	●	●

Figure 4: Indicators used to measure performance on SDG 1: No poverty and SDG 2: End hunger (Sachs et al. 2022: 177).

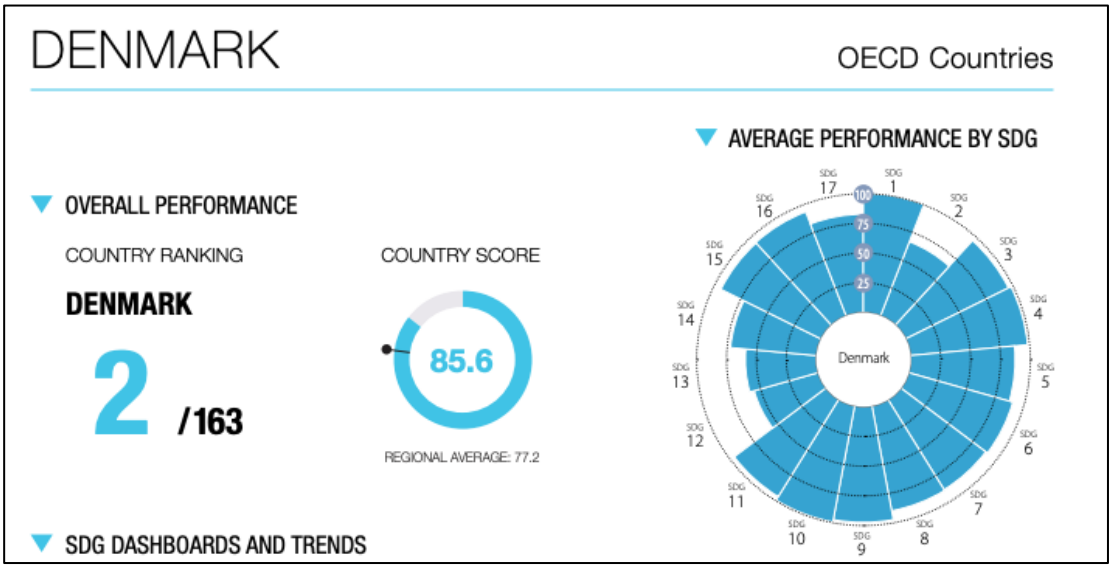


Figure 5: Denmark's fulfillment of SDGs according to their performance on indicators in Figure 4. (Sachs et al. 2022: 176).

Measuring distance to the fulfillment of SDGs

Examples

OECD Measuring Distance to the SDG Targets 2019

OECD The Short and Winding Road: Measuring Distance to the SDG Targets

This approach is also a quantitative approach, measuring the distance that still needs to be travelled to achieve the SDGs, rather than the fulfillment already achieved. While similar to measuring SDG fulfillment, this last approach shifts focus to remaining efforts, assuming achievement of an SDG as the final aim.

The two reports presented here are both published by the OECD, the former being from 2019, and the latter published in 2022. Similar for both reports, they address how far the OECD countries must go in order to fulfill the SDGs. However, they have different ways of displaying the results.

OECD Measuring Distance to the SDG Targets 2019

This report (OECD 2019) provides insight into how each individual OECD country stands. Figure 6 is an example of Denmark's distance to achieving the SDG targets. The assessment is based on 101 of 169 targets, all based on the data available for the country. According to the report, Denmark has in 2019 fulfilled 20 of the 101 measured targets, which can be seen by the colored bars that reach the fulfillment threshold called the 'level of achievement to be attained by 2030'.

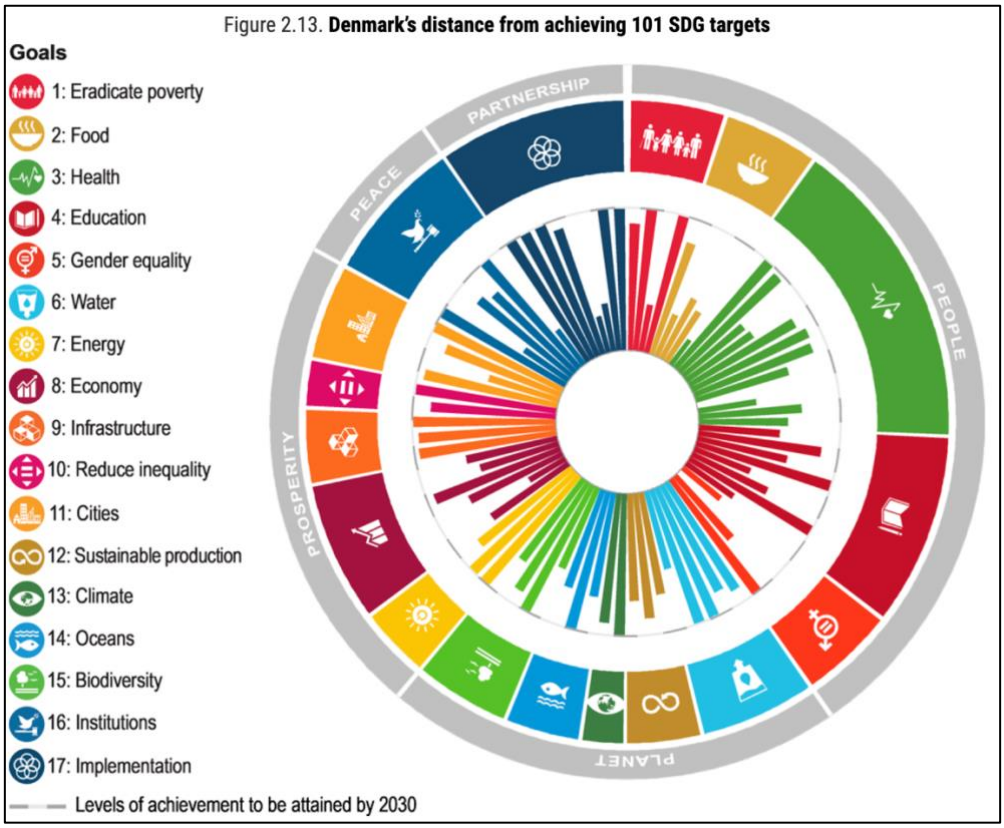


Figure 6: Denmark's distance to fulfilling 101 SDG targets. (OECD 2019: Figure 2.13).

OECD The Short and Winding Road: Measuring Distance to the SDG Targets

In 2022, an updated report was released showing the distance of OECD countries to fulfillment of the SDGs. This report no longer shows each individual country's assessment, but bases distance according to an average of all OECD countries, in which the SDGs have been categorized into People, Planet, Prosperity, Peace and Partnerships. Figure 7 shows a summary of distance to fulfillment of targets, displayed by goal. If using SDG 3 as an example, the graph should be understood such that the OECD countries as a collective average have a small distance to fulfilling 25% of targets for SDG 3, a medium distance to fulfilling approximately 55% of the targets for SDG 3, and a large distance to fulfilling approximately 20% of the targets for SDG 3. The report (OECD 2022) can be accessed (see references) for a better understanding of the methodologies used.

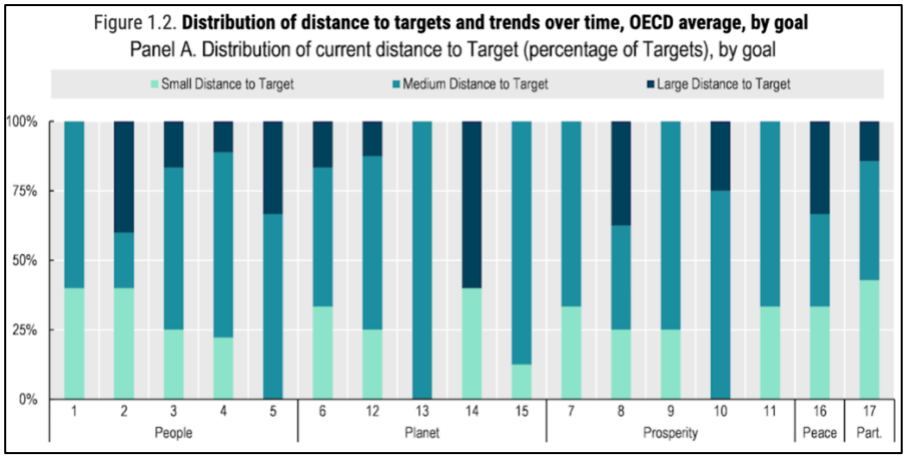


Figure 7: Distance to fulfilling SDG targets, according to an OECD average. The chart distinguishes between a small, medium, and large distance to meeting targets. (OECD 2022: Figure 1.2).

Figure 8 shows the targets where OECD countries have the greatest distance to meeting SDG targets. This shows that the countries are collectively furthest from fulfilling SDG 2, and more specifically, targets 2.2 and 2.5. To see the full chart of all targets and more details on the methodological calculations, see the report (OECD 2022) (found in references).

Table 1.2. **Largest OECD average distances from targets and recent trends**

Targets where OECD countries are, on average, furthest from meeting SDG targets

	Target	Average distance	
2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.46	N
2.5	By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed	3.59	N

Figure 8: The largest distances from meeting SDG targets, based on OECD averages. (OECD 2022: Table 1.2).

Identifying progress or trends

Examples

SDG index – country progress in fulfilling SDGs

Sustainable Development in the European Union (2022)

Emphasis can also be placed on illustrating trends, displaying the pathways that the object of assessment is on if aiming to achieve the targets. Being able to measure progress requires that "fulfillment" of the SDG/target is measurable, and thereby linked to indicators. Identifying progress is always relative to a standard, whether that be an average, an alternative year or a zero-alternative, etc. It also implies operating within a certain timeframe.

SDG index – country progress in fulfilling SDGs

First, we turn again to the SDG index (Sachs et al. 2022), where color-coded arrows are used to indicate how a country, region or income-group is progressing towards/digressing from the achievement of an SDG. Figure 9 below shows the achievement level of individual SDG goals, followed by general trend for both the region and the income-groups. If referring to Figure 4, these same trends are provided for each indicator under the individual country assessment.

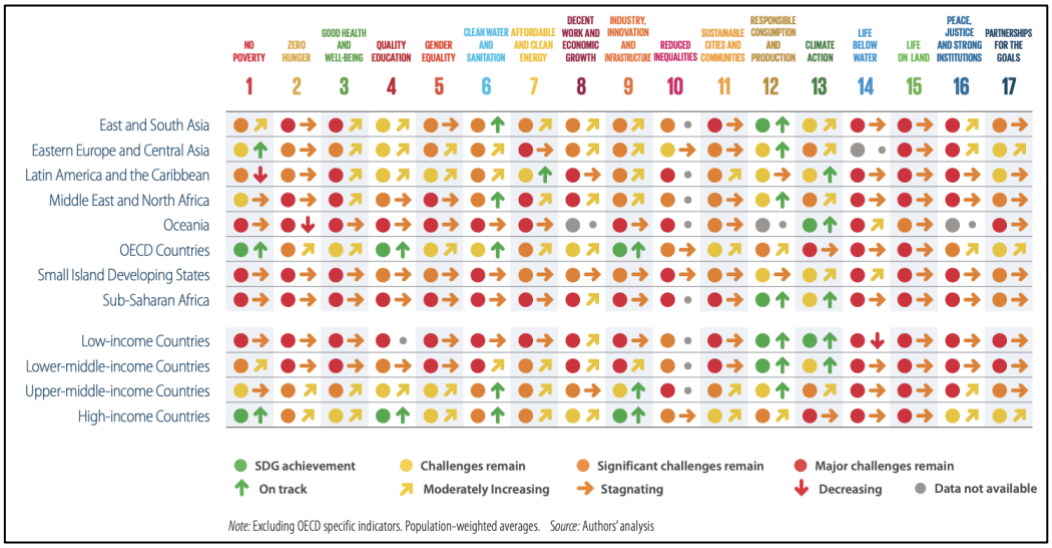


Figure 9: Color-coded arrows determine whether a country (in this case Australia) is on track to meeting SDG, moderately increasing, stagnating or decreasing in fulfillment status. (Sachs et al. 2022: 20).

The trend assessments are categorized into being 'on track or maintaining SDG achievement', 'moderately increasing', 'stagnating', 'decreasing' or 'data not available'. The trends are compared according to the performance on the country in 2015, and the descriptions are provided in Figure 10.

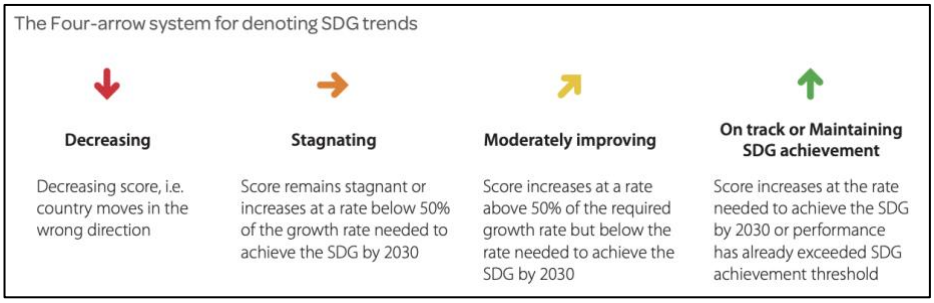


Figure 10: Description of color-coded arrows used for measuring progress in the SDG index (Sachs et al. 2022: 62).

The SDG trend arrow assigned depends on the pathway currently being followed. A graphic representation is provided in Figure 11. The green area represents the rate of growth for fulfilling SDGs (100%), the yellow area represents increasing at a rate above 50% of the required growth rate, the orange area represents below 50% of required growth rate, and the red area represents a decreasing growth rate below performance in 2015.

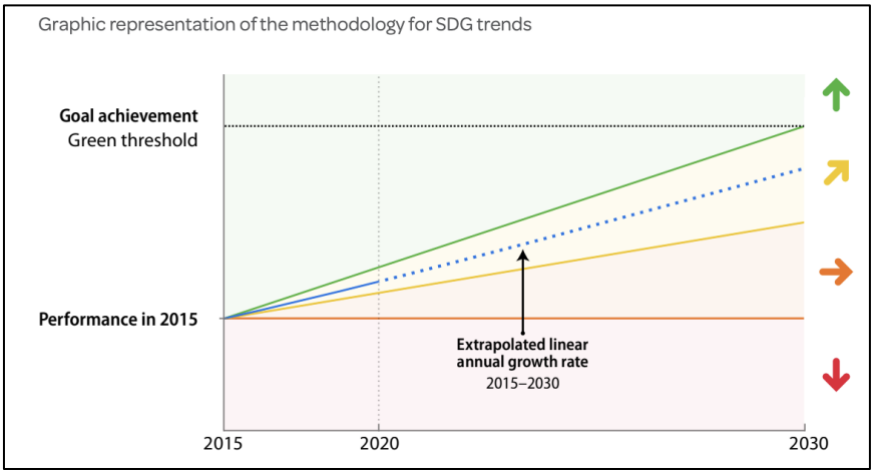


Figure 11: The methodology for determining progress trends. (Sachs et al. 2022: 62).

Sustainable Development in the European Union (2022)

Another report identifying trends is a report on Sustainable Development in the European Union (European Union 2022). Figure 12 shows SDGs according to progress (whether the EU as an average of European countries is significantly progressing, moderately progressing, or moderately moving away from).

The SDG placement is determined based on the progress designated for individual indicators for each SDG (as shown in Figure 13) according to the arrow key provided in Figure 14. The arrow designation is determined based on progress towards achieving either quantitative (EU targets) or qualitative targets (SD objectives). Progress is determined for both a short-term trend (past 5 years) and a long-term trend (15 years).

Figure 12: An approach to showing what SDGs (on a goal basis) the EU is progressing towards and the goals in which fulfillment is decreasing. (European Union 2022: 10).

The same report also maps SDG progress according to countries (Figure 15), providing both a status score (whether a country is amongst worst or best performing relative to other EU countries for that SDG) and a progress score (whether a country is progressing towards or moving away from fulfillment). This means that SDGs in the top row indicate that the country is amongst the best performing of the EU countries, while the bottom row is worst performing. In addition, SDGs on the right side of the graph shows progressing (an upwards green arrow), while left side indicates movements away from achieving a goal (downward red arrow).

Table 2.1: Indicators measuring progress towards SDG 2, EU

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Malnutrition			
Obesity rate	:	↓	page 60
Sustainable agricultural production			
Agricultural factor income per annual work unit	↑	↑	page 61
Government support to agricultural R&D	↑	↑	page 62
Area under organic farming	:	↗	page 63
Use of more hazardous pesticides	:	↘	page 64
Environmental impacts of agricultural production			
Ammonia emissions from agriculture	↗	↗	page 65
Nitrate in groundwater (*)	↘ (1)	↘ (1)	SDG 6, page 125
Estimated severe soil erosion by water (*)	↗ (2)	↗ (3)	SDG 15, page 277
Common farmland bird index (*)	↘ (4)	↘ (4)	SDG 15, page 280

Figure 14: The EU indicators and their corresponding progress designation for SDG 2: End hunger. (European Union 2022: 54).

Table 2.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Figure 13: A key for interpreting progress designation. (European Union 2022: 54).

Figure 18.6: Denmark

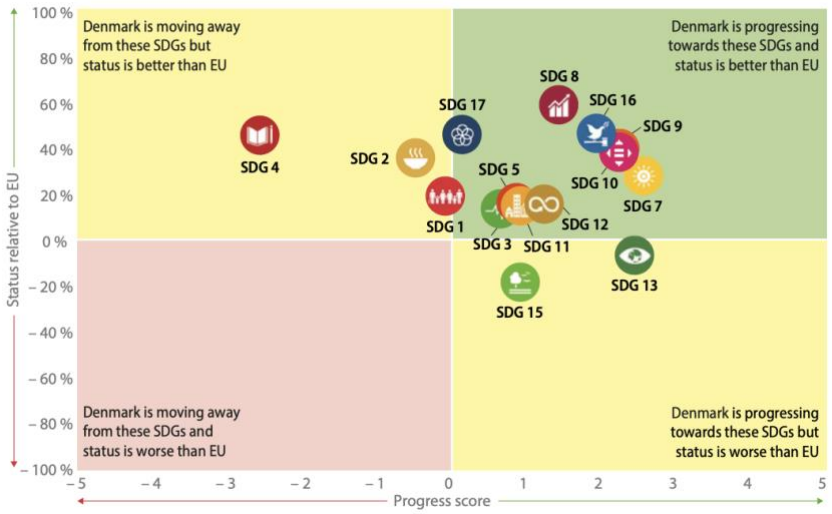


Figure 15: The progress of Denmark towards achieving the SDG, mapped both against status scores and progress scores. (European Union 2020: 324)

Comparing performance between two entities

Examples

COWI EIA for the Stormburst tunnel, Svanemøllen

Another measurement strategy is to compare the object of assessment to another, whether that be i.e., a comparison to a benchmark, another object's SDG performance, or different alternatives.

COWI EIA for the Stormburst tunnel, Svanemøllen

Although not a part of the final EIA report, alternatives were compared according to the SDGs for the cloudburst tunnel, Svanemøllen (COWI). Figure 16 measures the impact of different alternatives in the construction phase (the colored lines in the starburst chart) in which 3 is the 0-alternative level of impact, < 3 is a smaller impact, and > 3 is a greater impact. The impact is measured according to SDGs, found along the outer ring, of which 8 are determined relevant with corresponding measured impact. The words replacing the SDGs, are the environmental factors that influence the SDG they replace. This means that for SDG 3, traffic, noise, and vibrations are influencing factors.

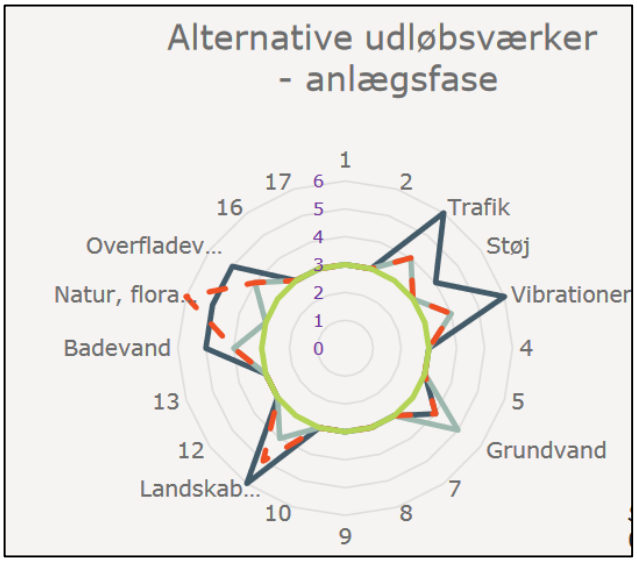


Figure 16: The comparison of SDG impacts for alternatives concerning outlets for stormwater in the EIA for the stormburst tunnel, Svanemøllen. The alternatives are compared to the zero alternative (green line). (COWI 2019).

This example is based on a qualitative assessment of potential degrees of impacts for the different alternatives.

References

Copenhagen Metro (Metroselskabet I/S). 2008. Cityringen: VVM-redegørelse og miljørapport. Municipality of Copenhagen and Municipality of Frederiksberg. Available at: https://m.dk/media/2245/vvm_cityringen_1_del.pdf.

COWI. 2019. Afprøvning af verdensmålsværktøj i MV af Svanemøllen Skybrudstunnel (SST). Miljøvurderingsdag (Environmental Assessment Day). Presentation on the 28th of August, 2019.

European Union 2022. Sustainable development in the European Union: Monitoring report on progress towards the SDGs in an EU context. 2022 edition. Available online at: https://ec.europa.eu/eurostat/documents/15234730/15242025/KS-09-22-019-EN-N.pdf/a2be16e4-b925-f109-563c-f94ae09f5436?t=1667397761499.

Gothenburg Centre for Sustainable Development. SDG Impact Assessment Tool. Available online at: https://sdgimpactassessmenttool.org/en-gb.

OECD 2019. Measuring Distance to the SDG Targets 2019: An Assessment of Where OECD Countries Stand. Available online at: https://www.oecd-ilibrary.org/sites/a8caf3fa-en/1/1/4/index.html?itemId=/content/publication/a8caf3fa-en&_csp_=1c51c432b7a7683f5a0142ba189c0c39&itemIGO=oecd&itemContentType=book#execsumm-d1e144.

OECD 2022. The Short and Winding Road to 2030: Measuring Distance to the SDG Targets. Available online at: https://www.oecd-ilibrary.org/sites/af4b630d-en/1/3/1/index.html?itemId=/content/publication/af4b630d-en&_csp_=5eae7ef40ea2d30f2851336b7c7b3ee2&itemIGO=oecd&itemContentType=book.

Rambøll. SDG Impact Assessment. Available online at: https://www.results.dk/un-goals/.

Sachs, J., Lafortune, G., Kroll, C., Fuller, G, & Woelm, F. (2022). Sustainable Development Report 2022. From crisis to sustainable development: the SDGs as a roadmap to 2030 and beyond. Cambridge University Press. Cambridge, United Kingdom. Available online at: https://s3.amazonaws.com/sustainabledevelopment.report/2022/2022-sustainable-development-report.pdf.

Project Partners

Project funded by

Innovation Fund Denmark

Get in touch via our webpage:
https://dreamsproject.dk/

Or follow us on LinkedIn

https://www.linkedin.com/company/dreamsproject/?originalSubdomain=dk