European Commission

Eurostat – Unit E.2: Environmental statistics and accounts; sustainable development

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The assessment of indicator trends against SDG-related EU objectives and targets

Data coverage and sources

Data in the EU SDG monitoring reports are mainly presented for the aggregated EU level, referring to the current EU composition (27 Member States). In addition to the EU Member States, data for the EU candidate countries and potential candidates as well as the countries of the European Free Trade Association (EFTA) are included in the country-level comparisons throughout the report when available, complementing the EU-level analysis. When data availability allows, global comparisons of the EU with other large economies in the world (such as the United States, Japan and China) are also presented.

To reflect the 2030 Agenda's 15-year scope, the analysis of trends is, as far as possible, based on data for the past 15 years. However, for several indicators, in particular those based on the EU Statistics on Income and Living Conditions (EU-SILC), data are only available from 2010 or 2015 onwards.

The data presented in the 2024 SDG monitoring report were extracted in late April 2024. Most of the data used to compile the indicators stem from the standard Eurostat collection of statistics through the European Statistical System (ESS), but a number of other data sources have also been used, including other European Commission services, the European Environment Agency (EEA), the European Institute for Gender Equality (EIGE) and the OECD.

Eurostat online data codes, such as sdg_01_10, allow easy access to the most recent data on the Eurostat website ([1]). The website also contains a section dedicated to the EU SDG monitoring, which provides key findings of the most recent Eurostat monitoring of the EU's progress towards the SDGs, information and data on

the EU SDG indicators, and data visualisation tools to see whether EU members make progress towards the SDGs. One of these visualisation tools is SDGs & me, which allows users to explore trends and compare their country to other European countries. The SDGs at a glance visualisation tool gives users a quick overview of the progress towards each of the SDGs and its sub-goals on an EU level. Additionally, the SDG country overview visualisation tool allows users to find out how their country performs for the SDGs compared to the EU average. The section moreover features the full SDG indicators database and provides useful information on the data. Further explanatory notes are also available in a methodology section. The information provided on the Eurostat website is complemented by a Statistics Explained webpage that presents the full range of statistical subjects covered by Eurostat in an easy-to-understand way.

Treatment of breaks in time series

Breaks in time series occur when the data collected in a specific year are not comparable with the data from previous years. This could be caused by a change in the classification used, the definition of the variable, the data coverage or other reasons. Breaks in time series could affect the continuity and consistency of data over time. However, it should be noted that such breaks may not necessarily undermine the reliability of the time series.

While preparing the EU SDG monitoring reports, a case-by-case assessment of breaks in times series is conducted to determine the extent to which a break would affect the assessment of an indicator. In cases where a break is considered significant enough to affect the assessment of an indicator trend or the comparability between countries, the analysis of the indicator is adjusted accordingly. Breaks in times series are indicated throughout the EU SDG monitoring reports in footnotes below the graphs.

Assessment of indicator trends

The SDG monitoring reports provide an assessment of indicator trends against SDG-related EU objectives and targets. The assessment method considers whether an indicator has moved towards or away from the sustainable development objective, as well as the speed of this movement. The method focuses on developments over time and not on the ‘sustainability’ of the status ([2]).

Ideally, the trends observed for each indicator would be compared against theoretical trends necessary to reach either a quantitative target set within the political process or a scientifically established and accepted threshold. However, this approach is only possible for a limited number of indicators, where an explicit quantified and measurable target exists for the EU. In the remaining cases, a

transparent and simple approach across the indicators is applied to avoid ad hoc and subjective value judgments. The two approaches are explained in more detail below.

The assessment of indicator trends is visualised in the form of coloured arrows (see Table 1). The direction of the arrows shows whether the indicators are moving in a sustainable direction or not. This direction does not necessarily correspond to the direction in which an indicator is moving. For example, a reduction of the long-term unemployment rate, or of greenhouse gas emissions, would be represented with a green upward arrow, as reductions in these areas mean progress towards the sustainable development objectives.

Depending on whether there is a quantitative EU policy target, two cases are distinguished, as shown in Table 1. For indicators with a quantitative target, the arrows show if, based on past progress, the EU is on track to reach the target. For indicators without a quantitative target, the arrows show whether the indicator has moved towards or away from the sustainable development objective, and the speed of this movement. The assessment method therefore differs slightly for these two types of indicators, as explained further below.

As far as possible, indicators are assessed over two periods:

- **Long term**, which is based on the evolution of the indicator over the past 15-year period (usually 2007 to 2022 or 2008 to 2023). The long-term trend is also calculated for shorter time series as long as the available data cover a period of at least 10 years. In exceptional cases, for example when data are not available in an annual time series, a 16-year period is used.

- **Short term**, which is based on the evolution of the indicator during the past five-year period (usually 2017 to 2022 or 2018 to 2023). In a few exceptional cases, the short-term trend is calculated for shorter time periods, as long as the available data cover a period of at least three years.

Two arrows — one for the long-term and one for the short-term assessment — are therefore usually shown for each indicator, providing an indication of whether the underlying trend has been persistent or has shown a turnaround at a certain point in time.

Table 1: Assessment categories and associated symbols

Symbol	With quantitative target	Without quantitative target
	Significant progress towards the EU target	Significant progress towards SD objectives
	Moderate progress towards the EU target	Moderate progress towards SD objectives
	[Category not applicable]	No progress towards nor movement away from 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 (e.g. time series too short or break in time series)	

Method 1: Indicators without quantitative targets

In case there is no quantified target, it is only possible to compare the indicator trend with the desired direction. An indicator is making progress towards the SD objectives if it moves in the desired direction, and is moving away from the SD objectives if it develops in the wrong direction. The assessment is based on the '[compound annual growth rate]' (CAGR) formula, which assesses the pace and direction of an indicator trend. The CAGR formula uses the data from the first and the last years of the analysed time span and calculates the annualised rate of growth of an indicator (given in % per year) between these two data points:

$$CAGR = \left(\frac{y_t}{y_{t_0}} \right)^{\frac{1}{t-t_0}} - 1 \quad (1)$$

where: t_0 = base year, t = most recent year, y_{t0} = indicator value in base year, y_t = indicator value in most recent year

To ensure a consistent approach throughout the report, the CAGR formula is applied to all indicators irrespective of their unit, meaning that it is also used for indicators already given as percentages (such as employment or poverty rates). The trend assessment is based on comparing the calculated growth rate of an indicator with a certain threshold, which is set at 1 % growth per year. The 1 % threshold is easy to

communicate, and Eurostat has used it in its monitoring reports for more than 10 years. It is discerning enough to ensure there is a significant movement in the desired direction. Furthermore, it allows a nuanced picture to be presented, with a sufficient number of indicators falling into all categories ([3]). The threshold should not be confused with the level of EU ambition on a given topic. It should also be noted that for some indicators, such as loss of biodiversity, any movement away from the SD objectives might be irreversible and lead to environmental, economic and social changes, thus affecting many SDGs simultaneously. The development of indicators with growth rates between 0.15 % and – 0.15 % is considered neutral and depicted with a dark gold arrow symbol. Table 2 shows the applied thresholds and the associated symbols.

Table 2: Thresholds for assessing trends of indicators without quantitative targets

Growth rate (CAGR) in relation to desired direction	Symbol
≥ 1 %	
< 1 % and ≥ 0.15 %	
< 0.15 % and > – 0.15 %	
≤ – 0.15 % and > – 1 %	
≤ – 1 %	

Method 2: Indicators with quantitative targets

The assessment of trends for indicators with targets is based on the CAGR described above and takes into account concrete targets set in relevant EU policies and strategies (see Table 4). In this case, the actual (observed) growth rate is compared with the (theoretical) growth rate that would have been required up to the most recent year for which data are available to meet the target in the target year. This comparison is done for both the long-term (past 15 years) and short-term (past 5 years) periods and does not take into account projections of possible future developments of an indicator. The calculation of actual and required indicator trends is based on the CAGR formula and includes the following three steps:

Actual (observed) growth rate:

$$CAGR_a = \left(\frac{y_t}{y_{t_0}} \right)^{\frac{1}{t-t_0}} - 1 \quad \text{(2a)}$$

where: t_0 = base year, t = most recent year, y_{t0} = indicator value in base year, y_t = indicator value in most recent year

Required (theoretical) growth rate to meet the target:

$$CAGR_r = \left(\frac{x_{t_1}}{y_{t_0}} \right)^{\frac{1}{t_1-t_0}} - 1 \quad \text{(2b)}$$

where: t_0 = base year, t_1 = target year, y_{t0} = indicator value in base year, x_{t1} = target value in target year

Ratio of actual and required growth rate:

$$R_{a/r} = \frac{CAGR_a}{CAGR_r} \quad \text{(2c)}$$

Table 3 shows the thresholds applied for the $R_{a/r}$ ratio and the resulting symbols. As the assessment is based on the comparison of the actual to the required growth rate, a neutral category (as included in Table 2 above) is not applicable in this case.

Table 3: Thresholds for assessing trends of indicators with quantitative targets

Ratio of actual and required growth rate	Symbol
≥ 95 %	↑
< 95 % and ≥ 60 %	↗
< 60 % and ≥ 0 %	↘
< 0 %	↓

The growth rates (CAGR) upon which the arrow symbols are based are provided in the overview tables in the beginning of each chapter. For indicators with quantitative targets, the note gives the compound annual growth rates observed for the two assessment periods as well as the growth rates that would have been required to meet the target in the target year. For indicators without quantitative targets, only the observed compound annual growth rates are given.

Table 4 shows the EU policy targets that have been considered for assessing indicator trends over the long- and short-term periods, to give an indication of whether the developments observed mean indicators are on track to meet their respective target in the target year. The list also specifies the respective EU policy documents in which these targets were set. In the tables in the beginning of each of the 17 thematic chapters of the SDG monitoring reports, the indicators assessed against an EU policy target are marked with a 'target' symbol (🎯).

Table 4: EU policy targets considered for assessing indicator trends

Indicator	Target	Policy reference
People at risk of poverty or social exclusion (SDG 1)	Reduce the number of people at risk of poverty or social exclusion by 15 million by 2030, including at least 5 million children	European Pillar of Social Rights Action Plan
Area under organic farming (SDG 2)	At least 25 % of the EU's agricultural land should be under organic farming by 2030	Farm to Fork strategy
Use and risk of chemical pesticides (SDG 2)	Reduce the use and risk of chemical pesticides by 50 % by 2030 compared to a three-year baseline (average for the period 2015 to 2017)	Farm to Fork strategy
Premature deaths due to exposure to fine particulate matter ($PM_{2.5}$) (SDG 3, SDG 11)	Reduce the health impacts of air pollution by at least 55 % by 2030 compared to 2005	Zero Pollution Action Plan
Road traffic deaths (SDG 3, SDG 11)	Halving the overall number of road deaths in the EU by 2030 compared with 2019	EU road safety policy framework 2021–2030
Total consumption of antibiotics in the community and	Reduce the total consumption of antibiotics in humans by 20 % by 2030 compared with the baseline year 2019	Council Recommendation on stepping up EU actions to combat antimicrobial

Indicator	Target	Policy reference
hospital sectors (SDG 3)		resistance in a One Health approach
Low achievers in reading, maths and science (SDG 4)	The share of low-achieving 15-year-olds in reading, mathematics and science should be less than 15 % by 2030	European Education Area
Participation in early childhood education (SDG 4)	At least 96 % of children between 3 years old and the starting age for compulsory primary education should participate in early childhood education and care by 2030	European Education Area
Early leavers from education and training (SDG 4)	The share of early leavers from education and training should be less than 9 % by 2030	European Education Area
Tertiary educational attainment (SDG 4, SDG 9)	The share of 25- to 34-year-olds with tertiary educational attainment should be at least 45 % by 2030	European Education Area
Gender employment gap (SDG 5)	Halve the gender employment gap by 2030 compared with 2019	European Pillar of Social Rights Action Plan
Positions held by women in senior management (SDG 5)	At least 40 % of the underrepresented sex must be represented in non-executive boards of listed companies by 2026	Directive (EU) 2022/2381
Primary and final energy consumption (SDG 7)	Reduction of energy consumption of at least 11.7 % in 2030 compared with the projections of the 2020 EU Reference Scenario, so that the EU's final and primary energy consumption amount to no more than 763 Mtoe and 992.5 Mtoe in 2030	Directive (EU) 2023/1791
Share of renewable energy in gross final energy consumption (SDG 7, SDG 13)	Raise the share of renewable sources in the EU's gross final consumption of energy to at least 42.5 % by 2030	Directive (EU) 2023/2413
Young people neither in employment nor in education and	Decrease the rate of young people neither in employment, nor in education or training (NEETs) aged 15 to 29 to 9 % by 2030	European Pillar of Social Rights Action Plan

Indicator	Target	Policy reference
training (NEET) (SDG 8)		
Employment rate (SDG 8)	At least 78 % of the population aged 20 to 64 should be in employment by 2030	European Pillar of Social Rights Action Plan
Gross domestic expenditure on R&D (SDG 9)	Increasing combined public and private investment in R&D to 3 % of GDP	Council Recommendation on a Pact for Research and Innovation in Europe
Share of households with high-speed internet connection (SDG 9, SDG 17)	By 2030, all European households should be covered by a gigabit network	2030 Digital Compass
Recycling rate of municipal waste (SDG 11)	Increase the share of municipal waste that is recycled or prepared for re-use to at least 60 % (by weight) by 2030	Directive (EU) 2018/851
Average CO_2 emissions per km from new passenger cars (SDG 12, SDG 13)	Reduce average CO_2 emissions from new passenger cars to 49.5 g CO_2/km by 2030	Commission Implementing Decision (EU) 2023/1623
Circular material use rate (SDG 12)	Double the EU's circular material use rate until 2030 (relative to 2020)	Circular Economy Action Plan
Net greenhouse gas emissions (SDG 13)	Reduce net greenhouse gas emissions by 55 % until 2030 compared to 1990	European Climate Law
Net greenhouse gas emissions from land use, land use change and forestry (LULUFC) (SDG 13)	Net greenhouse gas removals in the LULUCF sector should reach 310 million tonnes of CO_2 equivalent by 2030	Fit for 55 package
Marine protected areas (SDG 14)	Protect a minimum of 30 % of the EU's sea area by 2030	EU Biodiversity Strategy for 2030
Terrestrial protected areas (SDG 15)	Protect a minimum of 30 % of the EU's land area by 2030	EU Biodiversity Strategy for 2030

Indicator	Target	Policy reference
Official development assistance (SDG 17)	Provide 0.7 % of gross national income (GNI) as ODA by 2030	The new European Consensus on Development

Method for calculating average scores at the goal level

In the synopsis chapter of the SDG monitoring reports, average scores of the indicators are used to rank the 17 SDGs according to their level of progress over the short-term period (past 5 years). The calculation of average scores at the goal level is based on the calculations described above for the indicators that have been selected to monitor the respective SDG. For indicators without quantitative targets, the CAGR (see formula (1) above) is used. For indicators with quantitative targets, the ratio of actual to required growth (see formula (2c) above) is used.

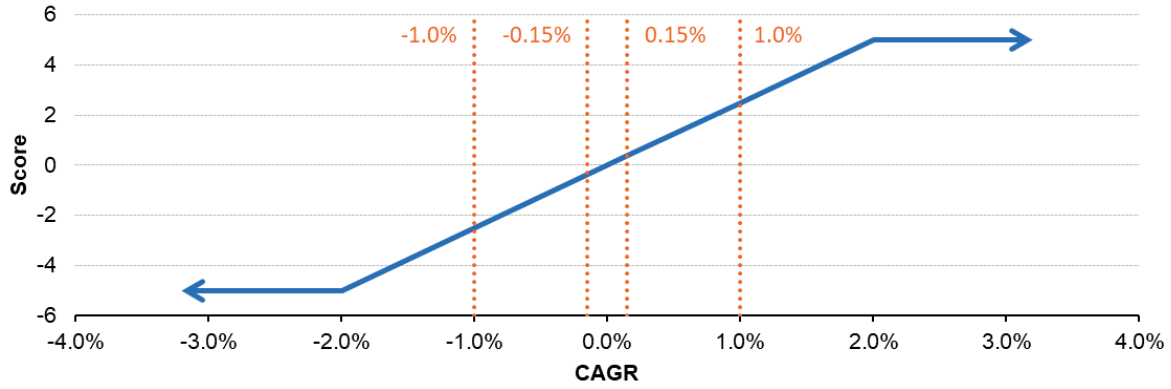
To account for the variability of growth rates within the assessment categories used in the SDG monitoring reports (see Tables 2 and 3 above), the calculation of average scores at the goal-level is based on transforming the individual indicator assessments (which represent categorical data) into numerical data. To this end, the growth rates and ratios calculated according to the formulas described above are inserted into a scoring function to calculate a score ranging from + 5 (best score) to – 5 (worst score) for each indicator. The average scores on the goal level are then calculated as the arithmetic mean of the individual scores of the indicators selected for monitoring the respective goal (including both main and multipurpose indicators). Consequently, these goal-level scores can also range from + 5 (best score) to – 5 (worst score).

Even though the scoring functions differ for indicators with and without quantitative target, the scores at the threshold points in Tables 2 and 3 are harmonised to ensure that indicators with and without quantitative targets have the same ‘weight’ when calculating the average score at the goal level. As such, the threshold values shown in Tables 2 and 3 result in scores of + 2.5, 0 and – 2.5, respectively. Indicators for which trends cannot be assessed (for example due to insufficient time series) are not considered for the average score on the goal level. Note that the scoring functions use broader cut-off points than the thresholds shown in Tables 2 and 3 in order to allow for larger variability in the scores (an indicator with a CAGR of, for example, 1.1 % per year receives a different score than an indicator with a CAGR of, for example, 5.0 % per year, although they both fall into the same assessment category of Table 2).

Scoring function for indicators without quantitative targets

Figure 1 below shows the scoring function for indicators without quantitative targets. In this case, the scoring function is a linear transformation, with cut-off points set at growth rates (CAGR) of 2.0 % and – 2.0 %. Indicators with a growth rate of exactly 0.0 % receive a score of 0. Indicators with growth rates of 2.0 % or above in the desired direction receive a score of + 5, indicators with growth rates of 2.0 % or above in the wrong direction receive a score of – 5.

Figure 1: Scoring function for indicators without quantitative target

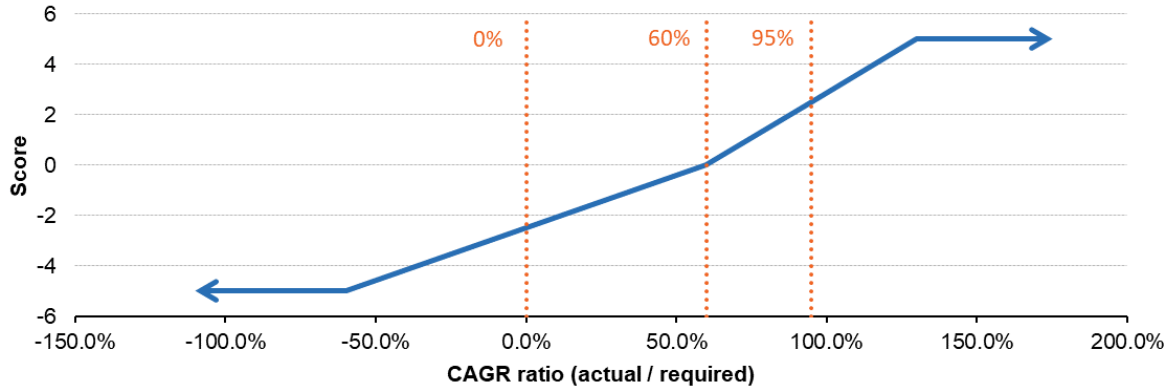


Note: The orange dotted lines represent the thresholds used for defining the assessment category of the indicator, as shown in Table 2. The resulting scores are harmonised between indicators with and without targets (see Figure 2).

Scoring function for indicators with quantitative targets

Figure 2 below shows the scoring function for indicators with quantitative targets. The scoring function is not linear in this case, with cut-off points set at CAGR ratios (actual to required growth) of 130 % and – 60 % (ratios below zero indicate a movement away from the target). Indicators with a CAGR ratio of 60 % receive a score of 0. Indicators with CAGR ratios of 130 % or above receive a score of + 5, indicators with CAGR ratios of – 60 % or below receive a score of – 5. The nonlinear slope of the scoring function for indicators with targets is a result of the harmonisation of the two scoring functions with respect to the threshold levels shown in Tables 2 and 3, which has been done to ensure that indicators with and without quantitative targets have the same ‘weight’ when calculating the average score at the goal level.

Figure 2: Scoring function for indicators with quantitative target



Note: The orange dotted lines represent the thresholds used for defining the assessment category of the indicator, as shown in Table 3. The resulting scores are harmonised between indicators with and without targets (see Figure 1).

Notes

([1]) In the EU SDG monitoring reports, online data codes are given as part of the source below each table and figure. When clicking on the online data code, the reader is directly led to the indicator table showing the most recent data. Alternatively, the data can be accessed by entering the data code in the search field on the Eurostat website. The indicator table also contains a link to the source dataset, which generally presents more dimensions and longer time series.

([2]) The following study discusses and analyses the differences in assessment methods of status (in a given year) and progress (change over time) for the EU Member States: Hametner, M., Kostetckaia, M. (2020), *Frontrunners and laggards: How fast are the EU member states progressing towards the sustainable development goals?*, Ecological Economics 177.

([3]) Higher thresholds (for example, 2 %) have been tested and finally rejected, since they make the overall picture less interesting, as a vast majority of indicators would fall in the two 'moderate' categories.