

Article

The COVID-19 Pandemic and the Implementation of Sustainable Development Goals: The EU Perspective

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Abstract: The 2030 Agenda, a global model for sustainable development, consists of 17 Sustainable Development Goals (SDGs) that the world is to fulfil by 2030. The achievement of the SDGs has been notably impacted by the COVID-19 pandemic. The objective of this article is to analyze and assess the progress of the European Union, as represented by selected indicators, towards the Sustainable Development Goals in the EU context and the impact of the COVID-19 pandemic. A blend of research methodologies, including desk research and analysis of secondary data from the Eurostat database, was employed in our research. Additionally, statistical methods were utilized to compare the SDG implementation before and after the onset of the COVID-19 pandemic. Even before the pandemic, the EU was making unequal progress toward the SDGs, with some areas needing more concentrated attention. COVID-19 has made it considerably harder for the EU and the rest of the world to accomplish the 2030 Agenda. The study assesses whether the pandemic caused a deviation from the previously set targets. The findings offer valuable insights that can be instrumental in shaping future policies and strategies aimed at attaining the SDGs.

Keywords: sustainable development goals; the 2030 Agenda; COVID-19 pandemic; European Union



Citation: Brzyska, J.; Szamrej-Baran, I. The COVID-19 Pandemic and the Implementation of Sustainable Development Goals: The EU Perspective. *Sustainability* **2023**, *15*, 13503. <https://doi.org/10.3390/su151813503>

Academic Editors: Sebastian Saniuk, Tomasz Rokicki and Dariusz Milewski

Received: 1 August 2023

Revised: 1 September 2023

Accepted: 7 September 2023

Published: 9 September 2023



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1. Introduction

In an era where social and economic inequalities, climate change, and environmental degradation have become key challenges globally, the international community has committed itself to the 2030 Agenda for Sustainable Development [1]. It is a universal action plan that was adopted in 2015 by the UN General Assembly Agenda for Sustainable Development 2030 [2]. Its main goal is to eradicate poverty, protect the planet and ensure peace and prosperity for all. It includes 17 ambitious Sustainable Development Goals (SDGs) that provide the direction for achieving a more sustainable and equitable world. They are a continuation and development of the Millennium Development Goals (MDGs) implemented by 2015 [3]. They cover a broad range of social and economic areas and provide a holistic approach to addressing global challenges. Achieving the SDGs is crucial for the long-term survival and well-being of humanity and the planet. They seek to ensure that development occurs in a balanced manner without compromising the ability of future generations to meet their needs.

The SDGs are classified into five groups, named the “Five Ps”: People, Planet Prosperity, Peace, and Partnership (the goals and their description are presented in Table A1 in Appendix A). Each of the Sustainable Development Goals is a global challenge requiring a global response. The SDGs are common to all UN member states, though each country has the opportunity to adapt the goals to its specific country contexts and needs [2].

The implementation of the SDGs is very important, although it is not a simple task. The different conditions of the member countries, economically, socially and environmentally, mean that not all targets can be achieved at the same time and at the same pace, and some seem very difficult, if not impossible, to achieve within the 2030 horizon set. The impact of destabilizing factors disrupting the process of achieving the SDGs also plays a large role

in this. Among these, the outbreak of the COVID-19 pandemic and the negative impact on global public health, the economy, as well as society was sudden, very strong and unprecedented, which is of particular importance.

The European Union is strongly committed to promoting sustainable development. It adopts a comprehensive approach, mainstreaming the SDGs in its policies. The EU financially supports a wide range of projects and initiatives that support the Sustainable Development Goals. The EU regularly reviews its progress on the SDGs [4,5], reporting to its citizens, and contributes to the global review process at the UN's High-Level Political Forum on Sustainable Development.

The objective of this article is to analyze and assess the progress of the European Union, as represented by selected indicators, towards the Sustainable Development Goals in the EU context and the impact of the COVID-19 pandemic. This research aims to test the hypothesis: during the COVID-19 pandemic, there was a slowdown in progress towards achieving sustainable development in the EU. The article seeks answers to the following questions:

1. How much time is needed to achieve the different SDGs targets in the EU?
2. Has it shortened during the pandemic period or lengthened, and by how much?
3. Which targets are challenging for the EU to achieve, and which ones are safe?

The answers to these questions have the potential to identify weaknesses and strengths in the EU's pursuit of the SDGs, which EU policy-makers may find valuable in setting policy instruments for sustainable development and faster achievement of the targets.

The authors' contribution to the literature is the enhancement of our understanding of the realization of SD quantitative targets within the EU. The authors enrich the academic landscape by providing a multifaceted perspective that is crucial for informed policy-making and scholarly debate. They also hope to stimulate the discussion on the measurable objectives that the EU set to be achieved by 2030.

2. Literature Review

Research on the implementation of the 2030 Agenda is of increasing interest to researchers. The amount of literature in this area is growing rapidly [6–15]. The innovative approach taken by the authors is to estimate the time required to achieve the set sustainable development goals while maintaining the current pace of change. It has the advantage of showing in a quantifiable way the achievements as well as the delays in achieving the SDGs in the EU.

There are different approaches in the literature studies on sustainable development goals. Some researchers analyze the achievement of SDGs on a global scale or from the point of view of one or a group of countries. Other researchers focus on selected goal(s) while omitting others. There are also many studies dedicated to examining a specific area (e.g., a selected economic sector, climate change) in terms of sustainable development and the achievement of the SDGs taking into account the impact of different factors, lately especially the COVID-19 pandemic. The timing of the publications is also of great importance. In those from 2020, only the impact of the first wave of the pandemic was examined [12,16–18]. Some authors undertook predictions and constructed different development scenarios [19,20]. Publications produced later tend to cover a longer time horizon, rely on a wider range of data and often present a broader scope compared to those produced earlier.

A comprehensive and systematic study of the implementation of the SDGs is carried out by a team of UN researchers and the results are published in an annual report outlining the progress in the implementation of the SDGs worldwide [21]. Alongside the report, a series examining the impact of COVID-19 on the Sustainable Development Goals and the potential pathway for socio-economic recovery from the effects of the pandemic is also being developed. These include looking at the range of possible future impacts of COVID-19 on different aspects of development and the benefits of bold choices that can accelerate the achievement of the 2030 Agenda and support investments that reap long-term benefits for sustainable development [22–24].

Another annual publication dedicated to examining the progress towards achieving the SDGs is a Sustainable Development Report produced by the Sustainable Development Solutions Network (SDSN). The report covers all UN member countries in its analysis. The most recent (eighth) edition focuses mainly on areas identified as urgent, requiring action to accelerate progress in the seven remaining years to 2030 [25].

On a regular basis, the state of progress of the European Union towards achieving the goals of the 2030 Agenda is also measured in Eurostat. The results of the surveys are published with an annual report. The seventh is now available [4]. The report tracks progress in recent years, highlighting areas requiring additional attention.

A study of the impact of the COVID-19 pandemic on progress towards the SDGs on a global scale was conducted by A. Rydz-Żbikowska. She indicated that progress towards the Sustainable Development Goals was significantly disrupted and impeded during the pandemic and that previous (pre-pandemic) efforts by governments and nations were undermined [26]. The negative impact of the COVID-19 pandemic and the increase in development disparities between countries was pointed out by J. Stiglitz [16]. A team from Thailand, in turn, analyzed the complex interrelationship of the pandemic's multidimensional impacts on people, well-being, planet, partnerships and peace and generated a causal loop diagram explaining these complex pathways and proposed policy recommendations [27].

Researchers from Belgium noted from the Flanders study that many of the SDGs targets due to the COVID-19 pandemic have slipped away, and much more time is required to achieve them than was initially anticipated; for some, there have been positive developments and an acceleration of the Sustainable Development Goals (especially SDG1 and SDG3). In this case, COVID-19 proved to be not only a challenge, but also a stimulus and an opportunity to engage more with (some of) the Sustainable Development Goals [28].

Many studies on the implementation of SDGs focus on a selected field. Researchers from South Africa and Singapore explored how digital technologies and circular economy concepts have been used in various sectors to address the UN's Sustainable Development Goals [17]. A team of researchers from Azerbaijan and Ukraine F. Rahmanov, R. Aliyeva, A. Rosokhata, and N. Letunovska examined the effects of the COVID-19 pandemic on the tourism sector in Azerbaijan under sustainable development [18]. An Indian team evaluated the impact of COVID-19 on the agro-food system and its economy, stressing critical factors like food production, demand, price hikes, security, and supply chain resilience [29]. The influence of the Circular Economy Phenomenon to Fulfil Global Sustainable Development Goals in the era of the COVID-19 pandemic was researched by an international team from the UK, Finland and Oman. It recommended a reassessment of national policies and programs given the disruption caused by the pandemic [30]. A Spanish research team also discussed the Circular Economy and the impact of the COVID-19 pandemic on achieving the SDGs in the scientific community [31]. In turn, Portuguese academics studied the impact of the COVID-19 pandemic upon university education and identified a strong need to improve sustainable digital development in teaching in higher education [32].

The COVID-19 pandemic had a significant impact on global efforts to achieve the SDGs. The literature emphasizes that the crisis caused by COVID-19 exacerbated the existing social and economic problems, impeding progress toward achieving the SDGs. The literature indicates that the COVID-19 pandemic had a significant negative impact on global efforts to achieve the Sustainable Development Goals. However, researchers also note that the crisis may provide an opportunity to accelerate sustainability efforts and build resilience to future shocks.

3. Materials and Methods

For a prolonged period, sustainable development, securely entrenched in European regulations, has been central to European policy. The adaptation of the 2030 Agenda for Sustainable Development, along with its 17 Sustainable Development Goals (SDGs) in 2015

by the United Nations, provided a new spark to global endeavours to attain sustainable development.

The EU committed itself to achieving the SDGs in the EU [33,34] through the European Green Deal [35] and other policy instruments [36–39]. The adoption of the SDGs was associated from the start with efforts to monitor these goals in the EU context. The European Commission in 2017 created a set of indicators to track the SDGs, and Eurostat uses them as the foundation for its yearly monitoring report on the SDGs in the EU. This indicator collection encompasses the social, economic, environmental, and institutional aspects of sustainability and is organized along the 17 SDGs. Five to six main indicators cover each SDG. Out of 100 indicators in 2023, 33 are “multi-purpose”—used to track many goals. This allows us the emphasis on the connection between different goals. There are currently 68 EU SDG indicators that are compatible with UN SDG indicators. The indicator set is reviewed on an annual basis to ensure ongoing policy relevance and to improve the indicator set’s statistical quality.

SDGs indicators can be further divided into two groups: those with and without quantitative targets. Table A2 in Appendix A shows examples of indicators with quantitative targets. Some examples of indicators without quantitative targets are rate of severe material and social deprivation, rate of obesity, government funding for agricultural R&D, patent applications to the EPO, air emission intensity from industry, forest area share or asylum applications. For some of these indicators, it is hard to set a quantifiable target, and sometimes it is also challenging to determine whether a higher or lower level is desirable, as it depends greatly on the context, country or time. This article focuses on the first group. We examine the trends of each indicator and evaluate their alignment with the predetermined quantitative target. These targets are derived from the political (e.g., European Climate Law) or scientific frameworks. This methodology is applicable only to a subset of indicators that have a quantifiable target. For the rest of the indicators, without a quantitative target, the decision whether a variable is moving towards or away from achieving the SDGs is a subjective judgement of the researcher. In the case where the growth rate is negative and we are interested in increasing values, the case is relatively simple. However, what to do when the growth rate is positive? What threshold should be taken as optimal? Monitoring the progress of indicators without a specific target in an automatic way poses a challenge. Eurostat in its annual reports establishes some benchmarks that need to be met. A rise in the indicator of 1% or more implies significant progress towards sustainable development. A positive change, but below 1%, indicates moderate progress. Conversely, a negative change implies a movement away from sustainable development (over −1% represents moderate and under −1% significant movement away). This technique allows for the automatization of the monitoring process of indicators without quantifiable targets. Nevertheless, a rise of around 1% is not necessarily a favourable outcome. According to the authors, this may be too low in some cases, given that for some indicators with a measurable target, the required growth rate exceeds 2%, 3%, 10% and sometimes even 50%.

A more desirable approach in monitoring the progress might be to analyze each indicator separately and appraise it based on its historical values and fluctuations. However, this technique is very time-intensive.

It should be emphasized that these indicators (without numerical targets) are also significant, as they quantitatively capture other dimensions of SD and the direction of their changes. However, our study focuses on the indicators with numerical targets because they provide a clear and measurable benchmark for assessing the progress and gaps in achieving SD by 2030. For instance, we include indicators such as people at risk of poverty or social exclusion and people killed in road crashes, which have specific numerical values to be reached. On the other hand, we exclude indicators such as severe material and social deprivation and share of zero-emission vehicles, which do not have explicit numerical targets but rather reflect general trends or patterns. These indicators may vary depending on the context and data availability, and it might be challenging to assess the magnitude of changes without adopting a subjective threshold.

Indicator trends are evaluated over two time spans (see Table A2, Appendix A):

- the long-term trend, which covers the indicator change over the last 15 years, before and after the pandemic (usually 2005–2019, 2005–2021/2022). For shorter time series, we calculate the long-term trend if data were available for at least 10 successive years (usually 2010–2019, 2010–2021). In a few exceptional cases, we calculate the long-term trend for shorter time periods (2012/2013–2019, 2012/2013–2021),
- the short-term trend, which covers the indicator change during the last five years, before and after the pandemic (usually 2015–2019, 2015–2021/2022).

The assessment of trends for indicators with targets is based on two formulas:

$$\text{Observed annual growth rate} = \sqrt[t-t_0]{\frac{y_t}{y_{t_0}}} - 1, \quad (1)$$

$$\text{Theoretical (required) annual growth rate} = \sqrt[2030-t_0]{\frac{y_{2030}}{y_{t_0}}} - 1, \quad (2)$$

where

t_0 = base year,

t = 2019 and most recent year,

y_{t_0} = indicator value in base year (2010, 2015; see Appendix A—first year in short- and long-term period),

y_t = indicator value in 2019 and most recent year (2020, 2021, 2022),

y_{2030} = target value in target year (2030).

If the observed value exceeds the theoretical value, then the case is simple and the 2030 target can very likely be met. If, on the other hand, it is lower, then meeting the target is impossible. This informs us that additional efforts need to be made to meet the 2030 target. In some cases, this extra effort may not be enough, as the actual and required rates differ too much (more than 30%—a threshold set subjectively) and there is little time left until the deadline year. In this case, we consider the achievement of the SDGs in 2030 to be at serious risk.

In the next step, the years needed to reach the target are computed. These calculations are based on the long- and short-term trends described above, at two points in time—in 2019—before the COVID-19 pandemic—and in 2021 (or 2020 where the time series ended earlier)—after the pandemic, from the formula

$$\text{Years needed to meet the target} = \log_{1+R} \frac{y_{2030}}{y_{t_0}}, \quad (3)$$

where

t_0 = base year,

2030 = target year,

R = observed annual growth year,

y_{t_0} = indicator value in base year (2019, 2021),

y_{2030} = target value in target year.

These values are then compared. If the number of years needed to reach the target before the pandemic is lower than after the pandemic, then a negative impact of the pandemic on the sustainable development goals can be assumed with high probability.

The article uses statistical data from the section dedicated to the EU SDG indicator set in the Eurostat website [40].

4. Results

The EU's progress in implementing the 2030 Agenda in the European Union has been uneven. When the very ambitious goals were set in 2015, it was hard to predict that a global pandemic would break out at the beginning of the third decade of the 21st century that

would determine the functioning of economies with enormous force and in many ways. To stop the spread of the pandemic in the EU, member states implemented blocking measures. The result was a significant drop in the EU's real GDP, a high loss in production, and an increase in socioeconomic disparities. Many indicators reflecting the level of achievement of the SDGs were compromised. The study distinguished three groups of 23 indicators based on the level of risk associated with achieving them on time.

- Group A—SDGs that are highly likely to be achievable by 2030 (the number of years needed to meet the target, based on the long-term trend from 2010–2022, is less than 8; there is small or hardly any risk),
- Group B—SDGs that are difficult to achieve by 2030, but with additional effort can be achieved within the target timeframe (the number of years needed to meet the target, based on the long-term trend from 2010–2022, is higher than 8 but lower than 20; medium risk),
- Group C—SDGs that are at high risk of being met and are likely to be impossible to achieve by 2030 (the number of years needed to meet the target, based on the long-term trend from 2010–2022, is higher than 21; significant risk).

Table 1 below presents summary results for the SDGs with quantitative EU policy targets. The goals are ordered by Column 4—“Years needed to meet the target in 2021”—from most to least likely to be met in 2030. The breakdown of the groups described above is provided.

Columns 4 and 5 contain the observed and required annual growth rates based on the long-term trend. The observed growth rate refers to the current annual value of the change in the phenomenon under study calculated for the period of analysis. The required growth rate is the annual rate that is necessary to achieve the target for the variable of interest by 2030. A comparison of their values also provides additional information about the achievability of the targets in 2030. If the required growth rate is smaller in absolute value than the observed one, the achievement of the 2030 target is more likely than in the opposite case. This is perfectly illustrated by the variables in Group A.

The direction of change that is desirable in the future for each indicator is displayed in Column 3. A positive annual growth rate is needed if there is an upward arrow, indicating that future values are expected to be higher than current ones. A downward arrow implies the opposite.

The last two columns present the number of years needed to reach the 2030 target. Two points in time were chosen: 2019, which was the year before the COVID-19 pandemic, and the year 2021, when the economy was starting to recover. Comparison of these values can show what the impact of the pandemic was on the achievement of indicators representing some of the SDGs. This is a relatively simplified approach, as it is important to remember the possible influence of other factors affecting the studied phenomenon. However, if before the pandemic fewer years were needed to reach the target, and after the pandemic the time increased, this is a clear signal that the situation worsened. The same is true if the difference between the tested values is more than two years. Due to the passage of time, only in the case where the 2021 values are smaller than two the situation can be considered as better after than before the COVID-19 pandemic. This occurred in only 9 out of 23 cases. The highest number of indicators (four) that improved represent Group C—the highest risk. There are three such indices in Group B and only two in Group A. However, it is irrelevant in the case of Group A with the lowest risk, as both values are so low that the target can still be achieved easily by 2030. When the situation worsens for Groups B and C indicators, it will take longer to see positive social, economic, and environmental effects.

In the subsequent step, a single indicator was selected to represent each group, with detailed results of the study presented in Tables 2–5. These calculations were carried out for all 23 indicators, but only the most intriguing ones were chosen. The selection process for groups A and C was straightforward—the outermost indicators from Table 1 were chosen, those requiring the shortest and longest durations to achieve the target. The first indicator is anticipated to be achieved within 2 years—significantly ahead of the 2030 deadline, while the latter has a projected timeline exceeding 170 years to reach the target.

Table 1. Summary results for the SDGs with quantitative targets in the EU.

Risk of Not Meeting the 2030 Target	Indicator	Desirable Direction of Change	Observed Annual Rate, Based on the Long-Term Trend	Required Annual Rate, from the Most Recent Data to 2030	Years Needed in 2019 to Meet the 2030 Target	Years Needed in 2021 to Meet the 2030 Target
Group A (small or no risk)	Share of households with high-speed internet connection (SDG 9, SDG 17)	↑	20.68%	4.01%	3.6	1.9
	Early leavers from education and training (SDG 4)	↓	−2.98%	−0.94%	3.7	2.8
	Terrestrial protected areas (SDG 15)	↑	4.07%	1.60%	2.5	3.6
	Tertiary educational attainment (SDG 4, SDG 9)	↑	2.24%	0.93%	5.9	3.8
	Premature deaths due to exposure to PM2.5 (SDG 3, SDG 11)	↓	−4.27%	−2.01%	3.4	4.7
	Employment rate (SDG 8)	↑	0.90%	0.72%	7.8	7.2
	Marine protected areas (SDG 14)	↑	12.48%	10.62%	7.7	7.7
Group B (medium risk)	Recycling rate of municipal waste (SDG 11)	↑	2.45%	2.14%	10	7.9
	People killed in road crashes (SDG 3, SDG 11)	↓	−3.53%	−6.04%	23.8	15.6
	Young people neither in employment nor in education and training (SDG 8)	↓	−2.26%	−4.09%	17.1	16.4
	Share of renewable energy in gross final energy consumption (SDG 7, SDG 13)	↑	3.83%	7.71%	21.2	17.8
Group C (significant risk)	Area under organic farming (SDG 2)	↑	5.60%	10.65%	20.8	18.6
	Gross domestic expenditure on R&D (SDG 9)	↑	1.26%	3.20%	22.7	22.7
	People at risk of poverty or social exclusion (SDG 1)	↓	−0.80%	−2.34%	12.4	26.6
	Net greenhouse gas emissions (SDG 13)	↓	−1.71%	−5.09%	33.7	27.3
	Primary energy consumption (SDG 7)	↓	−0.97%	−3.02%	37.8	28.3
	Official development assistance (SDG 17)	↑	0.98%	4.04%	17.3	36.5
	Participation in early childhood education (SDG 4)	↑	0.09%	0.41%	16.5	39.1
	Final energy consumption (SDG 7)	↓	−0.52%	−2.61%	60.2	46.0
	Gender employment gap (SDG 5)	↓	−1.42%	−7.13%	49.6	46.6
	Average CO ₂ emissions per km from new passenger cars (SDG 12)	↓	−1.65%	−9.08%	60.8	51.6
	Circular material use rate (SDG 12)	↑	0.73%	8.01%	57.1	95.3
	Net greenhouse gas emissions from land use, land use change and forestry (SDG 13)	↓	−3.81%	−52.02%	169.6	170.1

Source: own elaboration based on [41,42].

Table 2 below presents the results for an indicator related to the realization of Goals 9 and 17. The “Share of households with high-speed internet connection” is characterized by very high observed growth rates. The required annual growth rate is noticeably lower than the observed one, for both long-term and short-term trends. If the current pace of the indicator’s growth is maintained, the desired level can be achieved 5 years before the set deadline. This dynamic growth is an indirect effect of the outbreak of the COVID-19 pandemic, which significantly accelerated the implementation of digitalization processes and increased access to high-speed internet. This is perfectly illustrated by the decreasing “required annual rate” in the three lowest rows in Table 2.

Table 2. Share of households with high-speed internet connection.

Long-Term Trend	2013–2019	2013–2021	
Observed annual rate	21.47%	20.68%	
Years needed to meet the target	3.6	1.9	
Required annual rate (2013–2030)		11.55%	
Short-Term Trend	2015–2019	2015–2020	2015–2021
Observed annual rate	22.98%	22.25%	21.43%
Years needed to meet the target	3.3	3.4	3.6
Required annual rate (2015–2030)		10.65%	
Required annual rate (2019–2030)		6.48%	
Required annual rate (2021–2030)		4.01%	

Source: own calculation based on [40].

Table 3. People killed in road accidents.

Long-Term Trend	2010–2019	2013–2021	
Observed annual rate	−2.87%	−3.53%	
Years needed to meet the target	23.8	15.6	
Required annual rate (2013–2030)	−6.11%		
Short-Term Trend	2015–2019	2015–2020	2015–2021
Observed annual rate	−1.69%	−5.01%	−3.30%
Years needed to meet the target	40.8	13.5	20.7
Required annual rate (2015–2030)	−4.95%		
Required annual rate (2019–2030)	−6.11%		
Required annual rate (2021–2030)	−4.92%		

Source: own calculation based on [40].

Table 4. Net greenhouse gas emissions from land use, land use change and forestry (LULUCF).

Long-Term Trend	2010–2019	2010–2022	
Observed annual rate	−3.86%	−3.81%	
Years needed to meet the target	169.6	170.1	
Required annual rate (2010–2030)	−29.66%		
Short-Term Trend	2015–2019	2015–2020	2015–2022
Observed annual rate	−6.41%	−5.65%	−5.48%
Years needed to meet the target	100.8	114.8	118.7
Required annual rate (2015–2030)	−37.07%		
Required annual rate (2019–2030)	−45.53%		
Required annual rate (2021–2030)	−52.02%		

Source: own calculation based on [40].

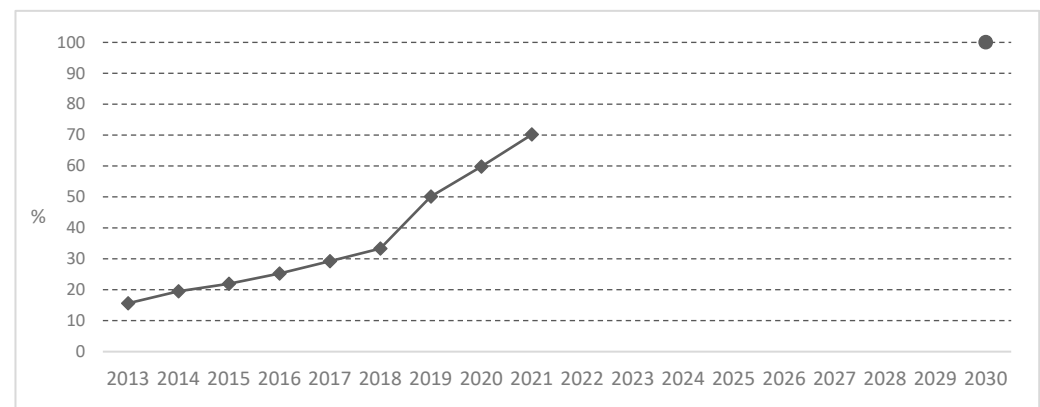
Table 5. People at risk of poverty or social exclusion.

Long-Term Trend	2010–2019		2010–2022
Observed annual rate	−1.42%		−0.80%
Years needed to meet the target	12.4		26.6
Required annual rate (2010–2030)	−1.52%		
Short-Term Trend	2015–2019	2015–2020	2015–2022
Observed annual rate	−3.19%	−2.02%	−1.37%
Years needed to meet the target	5.5	8.7	12.9
Required annual rate (2015–2030)		−2.03%	
Required annual rate (2019–2030)		−1.60%	
Required annual rate (2021–2030)		−2.34%	

Source: own calculation based on [40].

The data from Tables 2–5 are also shown in Figures 1–4 for a better visualization of the trends. The square markers represent actual data, while the bullet marker represents the goal for the year 2030. The data presented in the figures are based on the Eurostat database [40]. Figure 1 shows the data on “share of households with high-speed internet connection” from 2013 to 2020 with the target for 2030. The chart reveals a clear division into two periods of value growth, from 2013 to 2018, when the values increased by about 16% annually, and from 2018 to 2021, when the change accelerated to almost 30%. One of the possible causes may be digitalization which was accelerated by the COVID-19 pandemic. According to the European Investment Bank [43], close to half of the firms in the European Union invested in digitalization as a response to COVID-19, and digital firms were better able to cope with the disruption unleashed by the pandemic. The COVID-19 outbreak also increased the use of online services by a wide range of users and consumers [44].

From Group B, the indicator was selected as the first one from the list. However, this selection was not arbitrary, as the variable “road traffic crashes” changed under the influence of the pandemic. Due to the reduced traffic during the pandemic, in 2020, the number of road accidents decreased significantly (by almost 20%) compared to 2019, as shown in Figure 2. In subsequent years, this number increased systematically, but in 2022, this was still 10% lower than in the pre-pandemic year of 2019. According to the European Commission [45], around 20,600 people were killed in road crashes in the EU in 2022, displaying a 3% increase on 2021 as traffic levels recovered after the pandemic. The main factor for fatal collisions during the COVID-19 lockdown was speeding, which increased the ratio of deadly crashes to all crashes dramatically in some cities [46]. The EU and UN target is to halve the number of road deaths by 2030 [4].

**Figure 1.** Share of households with high-speed internet connection in the EU in 2013–2020 with the 2030 target.

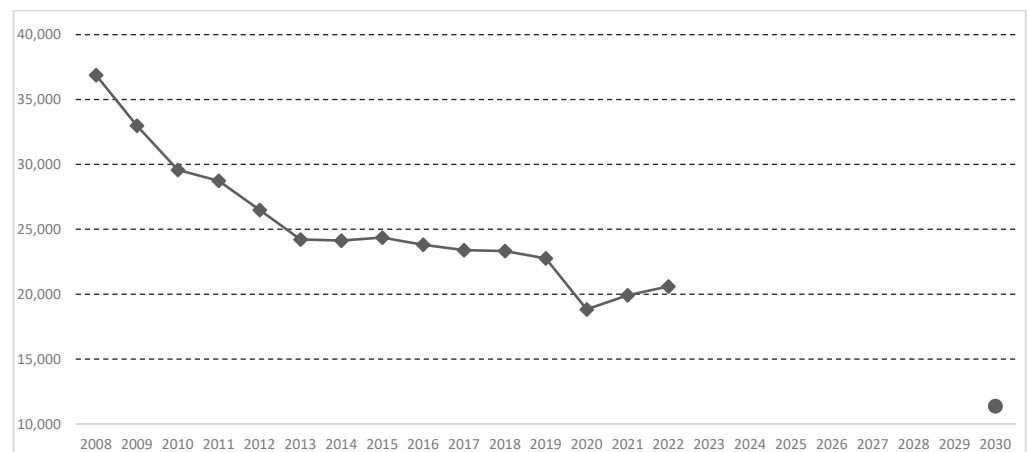


Figure 2. People killed in road accidents in the EU in 2013–2020 with the 2030 target.

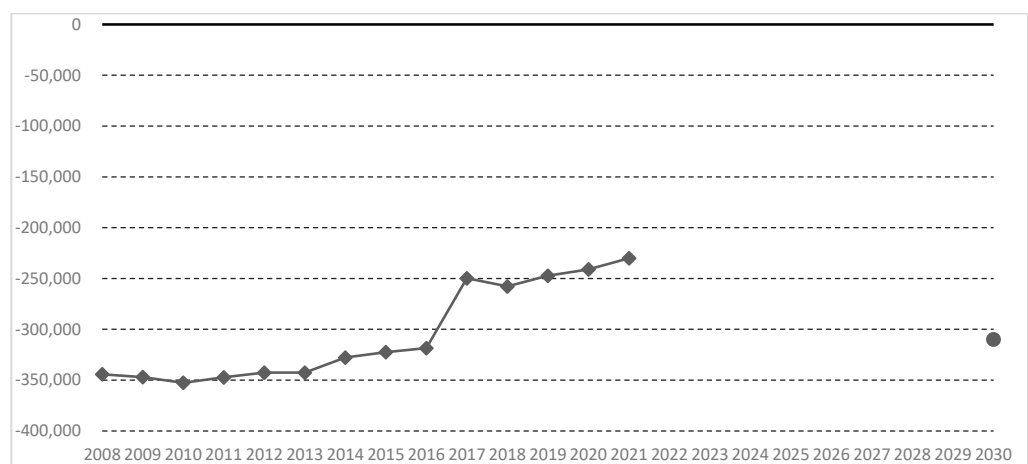


Figure 3. Net greenhouse gas emissions in EU in 2013–2020 with the 2030 target.

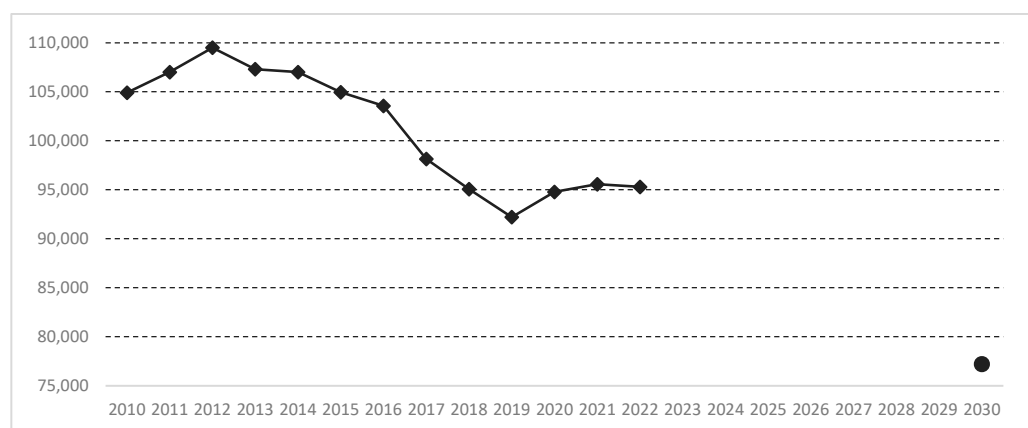


Figure 4. People at risk of poverty or social exclusion in the EU in 2013–2020 with the 2030 target.

Table 3 below presents the annual growth rates observed and required, calculated based on short- and long-term trends, and the estimated number of years needed to achieve the target. The COVID-19 pandemic clearly affected the reduction in the number of years required to achieve the goal for this variable. Based on long-term trends, there is a noticeable decrease in the number of years from almost 24 in the pre-pandemic of 2019 to nearly 16 in 2021. For short-term trends, the differences are even larger—more than 40 years were

needed to reach the target in 2019, and in the pandemic year of 2020 this number decreased by 1/3 to 13.5 years.

The next selected indicator, “net greenhouse gas emissions from land use, land use change, and forestry”, is aimed at climate change action (see Table 4). The goal is to reach 310 Mt of CO₂ equivalent by 2030. This level has already been achieved in the period of 2008–2014, but a drop has been recorded since 2015, and it is now completely off track. Instead of moving towards the minimization of net greenhouse gas emissions, there is an increase to 211.8 Mt of CO₂ equivalent in 2021. It was displayed in Figure 3 for a better visualization of the trends. This deterioration is dire. The goal seems impossible to achieve within the set timeframe, as it is estimated to take as long as 170 years if the growth rate from 2010 to 2021 is maintained. The required and observed growth rates differ significantly, by nearly tenfold.

The response to the COVID-19 pandemic led to a sudden reduction in greenhouse gas emissions and air pollutants [47]. With the closure of many international borders and people confined to their homes, there was a decrease in transport and shifts in consumption patterns. However, the decrease in greenhouse gas emissions was only temporary [48].

Another indicator from the last group deserves to be presented. It is the variable that relates to the social area and illustrates the number of people at risk of poverty or social exclusion. The target is to reduce this group by 15 million by 2030 [4]. The performance of this variable is presented below in Figure 4 and Table 5. The chart shows a significant decrease in the years 2012–2019. Based on the trend from 2010–2019, it can be said that the target would be achieved or very close to being achieved by 2030. The number of years needed in 2019 (12.4) was very close to the number of years remaining until 2030 (11). Unfortunately, with the emergence of the COVID-19 pandemic, it began to increase in the following years, and in 2022, almost 27 years were needed to achieve the assumed goal. This variable is distinguished from the others in Group C by the fact that its target was achievable before the pandemic, while for the remaining indicators, this was not possible either before or after the pandemic.

In summary, the selected indicators provide a mixed view of progress towards the set goals. While advancements in digital access show promise, the social and climate implications of recent global events pose significant challenges. Future efforts will need to consider these differing trajectories and devise strategies accordingly to navigate the complex path towards these ambitious targets.

5. Discussion

The literature review shows that authors of previous studies focus on assessing whether the sustainable development goals will be achieved on time. The articles or reports either concern a single SDG or a group of SDGs, related to, e.g., the social or environmental area. For instance, Eurostat reports cover all SDGs and are prepared annually. The authors of the article focus on indicators with numerical targets that they consider to be objective and that allow them the accurate display of the level of progress towards achieving sustainable development. Moreover, despite the extensive literature review, none of the analyzed studies provide an answer to the question of how many years it will take to achieve the target at a given development trend. The authors, using simple transformations based on the formula for Present Value, tried to answer this question. We calculated the years that are needed to achieve a given target. This makes the effect immediately visible in the form of a simple comparison of the obtained value with the number nine, which is the number of years remaining in 2021 until 2030. If the value is much higher, the target will not be achieved in 2030, assuming a constant trend. An undeniable advantage of the presented method is its universality in relation to data that have a measurable target. Moreover, our analysis can help identify the areas where more efforts and resources are needed to achieve SD, which includes the indicators from Groups B and C presented previously in Table 1.

The proposed approach has some limitations, as we only examined a subset of the indicators that constitute the SDG (1–3 out of 5–6 indicators); we cannot provide a com-

prehensive assessment of the direction of changes for each SD Goal. Nevertheless, we believe that the chosen approach enables a sound analysis, without subjective judgement. On the basis of the study carried out, it is not possible to show which of the SDGs targets will be achieved on time in the EU, as there are several indicators for each target, often relating to different areas. The results indicate their very different levels of risk. For example, SDG4, SDG 5 and SDG 9 illustrate measures belonging to outlying risk groups (A and C; see Table 1). Other examples of the methodological constraints of the study are, e.g., the possibility of non-constant or non-linear rates of target achievements due to the complexity of many social phenomena. This is related to the application of a quantitative approach, which relies heavily on past trends—unexpected events could alter trajectories. An additional problem may also be the incompleteness of the data set or a change in the methodology of collecting them, which affects completeness, continuity or comparability over time.

Furthermore, we suggest that future research could complement our approach by incorporating more indicators without specific targets and by using different methods to evaluate SD in a holistic and multidimensional way. A possible direction for further research is to examine the differences in SDG achievement across EU countries or regions and how the pandemic affected some areas more than others.

Building upon this research perspective, it becomes evident that the practical application of sustainable development concepts is both intricate and essential.

The realization of sustainable development principles represents a formidable challenge. Faced with contemporary ecological, social, and economic challenges, the imperative nature of these principles becomes clear. However, a mere vision is not enough. Strategies, programs, and tangible actions are required. Political recommendations play a pivotal role in this process, shaping the direction and framework of actions at both national and European Union levels. However, it is the practical recommendations that lead to direct actions and initiatives. Moreover, appropriate tools are vital for monitoring and evaluating progress.

The realization of the SDGs demands coordinated action across multiple levels, from local to global, as well as the engagement of numerous stakeholders in the process. Collaboration and partnership are essential for advancing sustainable development across all EU member states. The attainment of SDG targets necessitates the mobilization of financial resources. In this context, European funds stand out as a primary solution, which should primarily finance initiatives supporting the realization of the 2030 Agenda. Particularly critical are investments in green infrastructure, public transportation, renewable energy sources, and sustainable construction. A significant method for raising funds for these initiatives is the issuance of green bonds.

Greater engagement from the business sector is highly advisable. This can be achieved through financial incentives such as tax reliefs or subsidies that encourage actions aimed at sustainable development and investment in these areas. Alongside investments, innovations play a vital role. Hence, within the EU, there should be a significant emphasis on supporting innovation development by fostering an environment conducive to its creation and implementation, as well as providing financial backing. Promoting collaboration between the public and private sectors and establishing partnerships for sustainable development is a commendable direction. Tools that stimulate fair and green trade, such as custom preferences or other incentives, can also offer support. An intriguing approach would be to expand the group of companies required to report ESG, where they could showcase their contribution to the realization of the SDGs.

Education and raising public awareness about the importance of the SDGs are crucial. It is essential for the citizens of the European Union to understand, feel socially responsible for, and be actively involved in actions leading to sustainable development. Incorporating SDGs into school and academic curricula can serve this purpose. It is also imperative to involve diverse social groups, including women, youth, and minorities, in the planning and implementation of sustainable development initiatives.

A key component in the implementation of sustainable development is its monitoring and evaluation using appropriate indicators. This work aligns with this trend. It allows for the identification of areas that require greater support at a given time. Consequently, this ensures that policies are more effective.

6. Conclusions

As the European Union nears the midpoint of its journey towards the 2030 Agenda, the observed progress remains unsatisfactory. The COVID-19 pandemic has jolted the EU off course, affecting the trajectory towards meeting the objectives.

The study analyzed 23 indicators, measuring the attainment of Sustainable Development Goals in the EU context. Both short-term and long-term trends were calculated, providing an estimation of the number of years required to achieve each target. Examining the values from 2019 and 2021 enabled an assessment of whether the projected number of years shifted pre- and post-COVID-19 pandemic. The pandemic influenced the performance of several indicators, causing a clear change in direction to the opposite. The effect was either detrimental or beneficial. The former applied to the variable related to poverty and social exclusion. Conversely, variables related to the number of road accidents or GHG emissions showed better performance after the pandemic than before. However, the effect was short-term and insufficient to alter the trajectory of changes towards SD.

The estimated time required to reach the target while maintaining the assumed trend was highly varied. Indicators from Group A, categorized as “safe”, are highly likely to be achieved within the next 2–7 years. It has eight indicators assigned to it. Additional four indicators were assigned to Group B characterized by “medium risk”. They represent a greater challenge. They will take about 15–18 years to achieve and will therefore exceed the set deadline (2030). However, with increased concerted efforts towards these specific targets, their achievement is possible. The situation is different for the other 11 Group C indicators. This is because they require much more time to achieve (from 23 to more than 170 years) and have therefore been identified as significant risk.

During the COVID-19 pandemic, there was a deviation from the trajectory towards achieving the designated Sustainable Development Goals (SDGs). The estimated time required to reach the target while maintaining the assumed trend was highly varied. Indicators from Group A, categorized as “safe”, are highly likely to be achieved within the next 2–7 years. Indicators from Group B, characterized by a “medium risk”, might be reached within 15–18 years. The most time is needed to attain the targets for indicators from Group C, which are distinguished by a “significant risk”. For these, considerably more time is required—ranging from 23 to over 170 years.

The continual monitoring of the EU’s progress speed towards SDGs is imperative. Such scrutiny enables the identification of weak areas and the alignment of efforts towards rectifying these deficiencies within the Union. This analysis also contributes significantly to policy formulation by providing important information for those crafting strategies and action plans within the EU. In effect, it bolsters the implementation of sustainable development across the Union.

By staying abreast of the EU’s progress, joint efforts to achieve the goals set out in the 2030 Agenda can be more effectively guided. We hope that this article might help European policymakers and researchers make sensible choices by implementing wise sustainable development initiatives to better prepare European societies for the challenges of today and tomorrow. The results show that the EU needs to accelerate its actions and investments to achieve the SDGs by 2030, especially in the areas of climate change, poverty and inequality eradication.

Author Contributions: Conceptualization, J.B.; Methodology, I.S.-B.; Formal analysis, I.S.-B.; Investigation, J.B.; Resources, J.B.; Writing—original draft, J.B. and I.S.-B. All authors have read and agreed to the published version of the manuscript.

Funding: The project is financed within the framework of the program of the Minister of Science and Higher Education under the name “Regional Excellence Initiative” in the years 2019–2022; project number 001/RID/2018/19; the amount of financing PLN 10,684,000.00.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: While writing the article, we used the publicly available Eurostat database, SDG section (<https://ec.europa.eu/eurostat/web/sdi/database>, accessed on 31 July 2023). All links have been placed in the bibliography.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Sustainable Development Goals and main characteristics of EU SDG indicator set in 2023.

Sustainable Development Goals	Description of the Goals	SPs	Indicators per Goal	Selected Indicators, of Which in UN List	EU SDGs Indicators with Quantitative Target
1. No poverty	End poverty in all its forms everywhere	People	6	5	1
2. Zero hunger	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	People	5	1	2
3. Good health and well-being	Ensure healthy lives and promote well-being for all at all ages	People	6	3	2
4. Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	People	6	5	5
5. Gender equality	Achieve gender equality and empower all women and girls	People	6	5	1
6. Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all	People	6	5	-
7. Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all	Prosperity	6	3	2
8. Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Prosperity	6	4	2
9. Industry, innovation and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Prosperity	6	5	3
10. Reduced inequalities	Reduce inequality within and among countries	Prosperity	6	4	-
11. Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable	Planet	6	5	3
12. Responsible consumption and production	Ensure sustainable consumption and production patterns	Planet	6	2	2
13. Climate action	Take urgent action to combat climate change and its impacts	Planet	5	3	3
14. Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Planet	6	4	1
15. Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss	Planet	6	5	1
16. Peace, justice and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Peace	6	5	-
17. Partnerships for the goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development	Partnership	6	4	2
Total			100	68	23 *

* The value is not a simple sum of the column, as some indicators are used to describe several SDGs.

Table A2. EU Sustainable Development Goals Indicators with quantitative EU policy targets.

No. of the SDG	Indicator	Target	Target for 2030	Oldest Data	Most Recent Data	Long-Term Trend (Pre- and Post-COVID-19)	Short-Term Trend (Pre- and Post-COVID-19)
SDG 1	People at risk of poverty or social exclusion	Reduce the number of people at risk of poverty or social exclusion by 15 million by 2030, including at least 5 million children	72.2 million	2010 (from previous reports)	2022	2010–2019 2010–2022	2015–2019 2015–2020 2015–2022
	Children (<18 years old) at risk of poverty or social exclusion		13.4 million	2015	2022	x	
SDG 2	Area under organic farming	At least 25% of the EU's agricultural land should be under organic farming by 2030	25%	2012	2020	2012–2019 2012–2020	2015–2019 2015–2020
SDG 3, SDG 11	Premature deaths due to exposure to fine particulate matter (PM2.5)	Reduce the health impacts of air pollution by at least 55% by 2030	194,021 pers.	2005	2020	2010–2019 2010–2020	2015–2019 2015–2020
	People killed in road crashes	Halving the overall number of road deaths in the EU by 2030 starting from 2019	11,378 pers.	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 4,	Low achievers in reading, maths and science	The share of low-achieving 15-year-olds in reading, mathematics and science should be less than 15% by 2030	15%	2006 (every 3 years)	2018	2006–2018	2015–2018
	Participation in early childhood education	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	>96%	2013	2021	2013–2019 2013–2021	2015–2019 2015–2021
	Early leavers from education and training	The share of early leavers from education and training should be less than 9% by 2030	<9%	2002	2022	2005–2019 2005–2022	2015–2019 2015–2022
	Share of adults having at least basic digital skills	Due to a major methodological change in 2021, the time series for the revised indicator starts in 2021	>80%	2021	2021	x	x
SDG 4, SDG 9	Tertiary educational attainment	The share of 25 to 34 year olds with tertiary educational attainment should be at least 45% by 2030	>45%	2002	2022	2005–2019 2005–2022	2015–2019 2015–2022
SDG 5	Gender employment gap	Halve the gender employment gap by 2030 compared with 2019	5.6 percentage points	2009	2022	2009–2019 2009–2022	2015–2019 2015–2022

Table A2. Cont.

No. of the SDG	Indicator	Target	Target for 2030	Oldest Data	Most Recent Data	Long-Term Trend (Pre- and Post-COVID-19)	Short-Term Trend (Pre- and Post-COVID-19)
SDG 7	Primary energy consumption	Reduce final energy consumption of at least 11.7% in 2030 compared with the energy consumption forecasts for 2030 made in 2020; for monitoring purposes, this was translated into absolute levels of primary and final energy consumption	993 Mtoe	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
	Final energy consumption		763 Mtoe	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 7, SDG 13	Share of renewable energy in gross final energy consumption	Raise the share of renewable energy in the EU's overall energy consumption to 42.5% by 2030 (with an additional 2.5% indicative top up that would allow to reach 45%)	42.5%	2004	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 8	Young people neither in employment nor in education and training (NEET)	Decrease the rate of young people neither in employment nor in education or training (NEETs) aged 15 to 29 to 9% by 2030	9%	2009	2022	2009–2019 2009–2022	2015–2019 2015–2022
	Employment rate	At least 78% of the population aged 20 to 64 should be in employment by 2030	>78%	2009	2022	2009–2019 2009–2022	2015–2019 2015–2022
SDG 9	Gross domestic expenditure on R&D	Increase combined public and private investment in R&D to 3% of GDP	3% of GDP	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 9, SDG 17	Share of households with highspeed internet connection	By 2030, all European households should be covered by a gigabit network	100% households	2013	2021	2013–2019 2013–2021	2015–2019 2015–2021
SDG 11	Recycling rate of municipal waste	Increase the preparing for reuse and the recycling of municipal waste to a minimum of 60% by weight by 2030	60%	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 12	Average CO ₂ emissions per km from new passenger cars	Reduce by at least 55% by 2030 (compared to 2021)	49.4 g CO ₂ per km	2007	2021 (break in time series, provisional)	2010–2019 2010–2021	2015–2019 2015–2021
	Circular material use rate	Double the EU's circular material use rate until 2030	23.4% of material input for domestic use	2004	2021 (provisional)	2010–2019 2010–2021	2015–2019 2015–2021

Table A2. Cont.

No. of the SDG	Indicator	Target	Target for 2030	Oldest Data	Most Recent Data	Long-Term Trend (Pre- and Post-COVID-19)	Short-Term Trend (Pre- and Post-COVID-19)
SDG 13	Net greenhouse gas emissions	Reduce net greenhouse gas emissions by 55% until 2030 compared to 1990	45% of 1990	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
	Net greenhouse gas emissions from land use, land use change and forestry (LULUCF)	Net greenhouse gas removals in the LULUCF sector should reach 310 million tonnes of CO ₂ equivalent by 2030	−310 million tonnes of CO ₂ equivalent	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021
SDG 14	Marine protected areas	Protect a minimum of 30% of the EU's sea area by 2030	30% of the EU's sea area	2012 (every 3+ years)	2021	2012–2019 2012–2021	2015–2019 2015–2021
SDG 15	Terrestrial protected areas	Protect a minimum of 30% of the EU's land area by 2030	30% of the EU's land area	2013	2021	2013–2019 2013–2021	2015–2019 2015–2021
SDG 17	Official development assistance	Provide 0.7% of gross national income (GNI) as ODA within the timeframe of the 2030 Agenda	0.7% of GNI	2000	2021	2010–2019 2010–2021	2015–2019 2015–2021

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