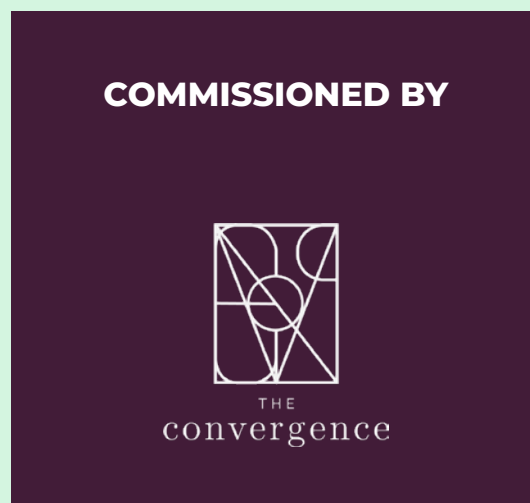


Underfunded transition to sustainable future of humankind

SDGs economic review, green
tech & sustainability
market overview



2023

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2 Foreword

The climate crisis is progressing more rapidly. It is becoming visible even to the eyes of the average inhabitant of the planet in the form of more extreme weather events and rising average temperatures. In recent years, various types of policies have been formulated to help ensure that our world will still be a liveable place for us as well as other species after the year 2050.

The most important of these is the United Nations 2030 Agenda. Its most important outcome are the Sustainable Development Goals (SDGs), which are the follow-up to the Millennium Development Goals (MDGs). These 17 goals set out the direction that has been and must be taken to avoid environmental catastrophe and to kick-start a less destructive mode of economic growth. The Goals provide an approximate answer to the questions of not only whether we are moving in the right direction, but how far we have come in achieving them.

These are not as trivial questions as one might think, and getting answers to them is more difficult than expected. There are several reasons for this. Accurate measurements are both a question of scientific and bureaucratic capacity, and not all countries/regions have the same comfort of a competent public sector as the developed countries of the world, for example member states of the OECD. Even in their case, however, it is not easy to answer all questions without contradiction.

It is even more complicated to define what should be done. At the turn of the millennium, the vision of globalisation, economic growth and (neo)liberal reforms dominated the debate on the future of the world. This position has been met not only with criticism but also with opposition in the streets of the rich North and vocal dissent from the states of the (global) South.

Then, between 2010 and 2020, concepts such as green growth emerged as a response to criticism of growth, seeking to steer economic growth in a more sustainable and inclusive direction. Green growth means economic growth with an emphasis put on maintaining the capacity to renew natural resources. Green technologies are essential to this type of growth. Concepts such as Degrowth dispute the necessity of growth completely.

Negotiations on the 2030 Agenda took place between 2012 and 2015. It took nearly two more years of discussions on indicators and how to measure them.

In this study, we work extensively with the Sustainable Development Goals (SDGs) as a basic framework, and this is because they do not only focus on the environmental aspect of development. The main objective of the study is to take a closer look at where we stand today and what resources we need to mobilize to achieve the SDGs.

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3 Executive summary

At present, meeting the Sustainable Development Goals (SDGs) by the year 2030 seems unlikely. In order to reverse the negative trend in progress towards achieving them, public and private resources flowing into green technologies and infrastructure would need to increase significantly. The original estimate was that to achieve the SDGs, we needed to invest between \$5 trillion and \$7 trillion a year. Pessimistic estimates claim we are \$4 billion a year in investment short of that target. \$3.3 to \$4.5 trillion a year was needed to invest in developing countries alone, leaving, for example, \$1.7 trillion short in 2021.

While China or the European Union are targeting structural investments in sustainable infrastructure in hundreds of millions of euros, The United States is still in the tens of millions of dollars a year. By 2023, at the very least, subsidies directed towards green infrastructure should surpass fossil fuel subsidies in volume. The contributions of these three economic units are crucial, as they emit the majority of greenhouse gasses globally and are the most powerful economic players.

Increasing the flow of development assistance from OECD countries to low- and middle-income economies is also crucial to achieving the Goals. Most aid, 16% of total aid, flows to health-related initiatives (SDG 3), 13% goes to projects seeking to eliminate hunger (SDG 2) and 10% to improving education (SDG 4). The least supported is Life below Water (SDG 14), which received only 3 % of financial support.

The contribution of the private sector will also be crucial for the development of sustainable infrastructure. The most effective way to increase this is to make sustainability more attractive as an investment opportunity. This is happening thanks to some government policies (such as the ESG regulation), co-financing with the public sector, the cheapening of green technologies and advancing climate change, which is increasing the demand for building sustainable infrastructure. Sustainable investment assets were worth \$35.3 trillion in 2020. Bonds that enabled the financing of sustainable projects exceeded \$1 trillion in 2021.

A sustainable economy has the potential to generate economic value worth \$12 trillion globally, particularly in the areas of energy, urban development, agriculture and health. If The Sustainable Development Goals (SDGs) are to be met, new types of sustainable and inclusive business should create up to 380 million jobs by 2030, around 90% of them in developing countries.

4 Sustainable development from an economic perspective

4.1 Size and growth of the market

The classification we use is based on the UN Sustainable Development Goals.¹ These are a comprehensive set of goals, the achievement of which should lead to avoiding the most severe impacts of climate change. They also take into account quality of life and economic development. Each of the Goals contains sub-goals, which together total 169. A total of 231 unique indicators are defined to measure level of their fulfillment², as some of them are used for more than one SDG the total number of indicators listed is 247.³

Specifying the type of opportunity or challenge that the SDGs present in their economic dimension is not easy. The scale of investment required to achieve the SDGs is very difficult to define more precisely, mainly due to the unavailability/inconsistency of the data.

The most accurate calculation of SDGs compliance rates is available for OECD countries. We also have accurate data for sub-sectors, especially those related to investment - data on impact investment, (green) bonds and green tech are available and updated.

4.1.1 Global view

To achieve the 2030 Agenda for Sustainable Development, between \$5 trillion and \$7 trillion a year needs to be mobilized globally.⁴ \$3.3 trillion to \$4.5 trillion a year in developing countries alone.⁵

This will be achieved through a combination of public and private resources. The UN should only coordinate these financial flows, but has not created any new global agencies. To achieve its objectives, it has created the Green Climate Fund (GCF) under the Framework Convention on Climate Change, as well as the Joint SDGs Fund.

In the case of developing countries, it should be a combination of domestic and foreign resources.

Domestic sources can be funding from tax revenues or private investment.

In the case of developing countries, the focus is also on increasing financial flows from abroad. This can also come from private (foreign direct investment, portfolio investments, remittances) or from public sources (ODA⁶, loans and other forms of official aid).

4.1.2 Regional view

The biggest challenge is to reduce greenhouse gas production. It is therefore also the area offering the greatest type of opportunity for further growth of the green tech sector.

4.1.2.1 Major players China, USA and EU

The Asia-Pacific region is the largest emitter of carbon dioxide, with China being the largest emitter, representing 31% of global emissions (27% according to the World Bank⁷, 33% according to the European Commission⁸), followed by North America (USA 12.5%, Canada 1.5%, Mexico 1.1%) and Europe (7.3%).⁹ These 3 regions together represent 80% of global emissions. In these regions, the systems of production will need to be transformed so that they no longer exceed planetary limits.

In lower income regions, there is a problem of resource scarcity. Therefore, local governments cannot afford to finance the infrastructure for green technologies and their implementation is not a central issue here. In the context of the SDGs, the need to invest in developing countries is the most talked about issue. Investment should flow mainly from OECD countries. The need to increase financial flows from developed to

1 <https://www.undp.org/sustainable-development-goals>

2 <https://unstats.un.org/sdgs/indicators/indicators-list/>

3 <https://wesr.unep.org/article/sustainable-development-goals-0>

4 https://unctad.org/system/files/official-document/wir2014_en.pdf

5 <https://unsdg.un.org/2030-agenda/financing>

6 Official Development Assistance

7 <https://openknowledge.worldbank.org/server/api/core/bitstreams/35ea9337-dfcf-5d60-9806-65913459d928/content>

8 https://edgar.jrc.ec.europa.eu/report_2022

9 <https://www.statista.com/statistics/205966/world-carbon-dioxide-emissions-by-region/>

developing countries is also mentioned, for example, in Article 9 of the Paris Agreement.¹⁰

In poorer regions, significant investment will also be needed in SDGs such as fighting poverty, hunger and increased access to education

4.1.2.2 OECD countries

The OECD today brings together 38 of the most economically advanced countries. OECD countries are closest to meeting the SDGs. According to their own measurements published in April 2022, they are close to achieving at least 25% of the indicators for 12 of the 17 goals.¹¹ No indicator is close to being met for the SDGs:

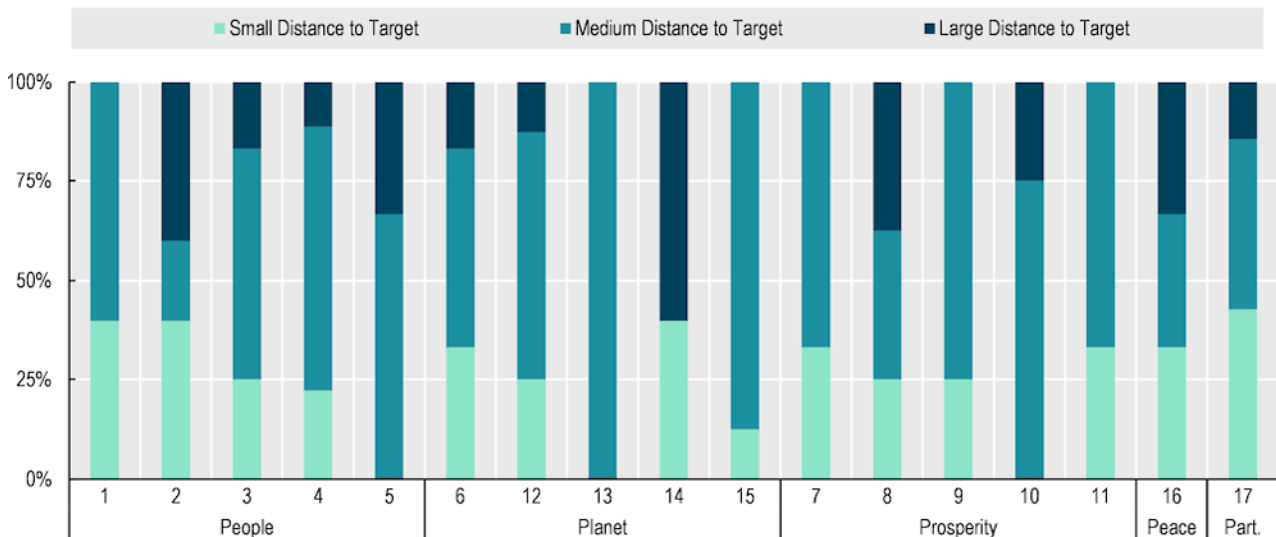
SDG 5: Gender equality,

SDG 10: Less inequality,

SDG 13: Climate action.

However, there are only four SDGs for which there are no indicators with no stagnation or regression. Most indicators are not on track to be met in 2030.

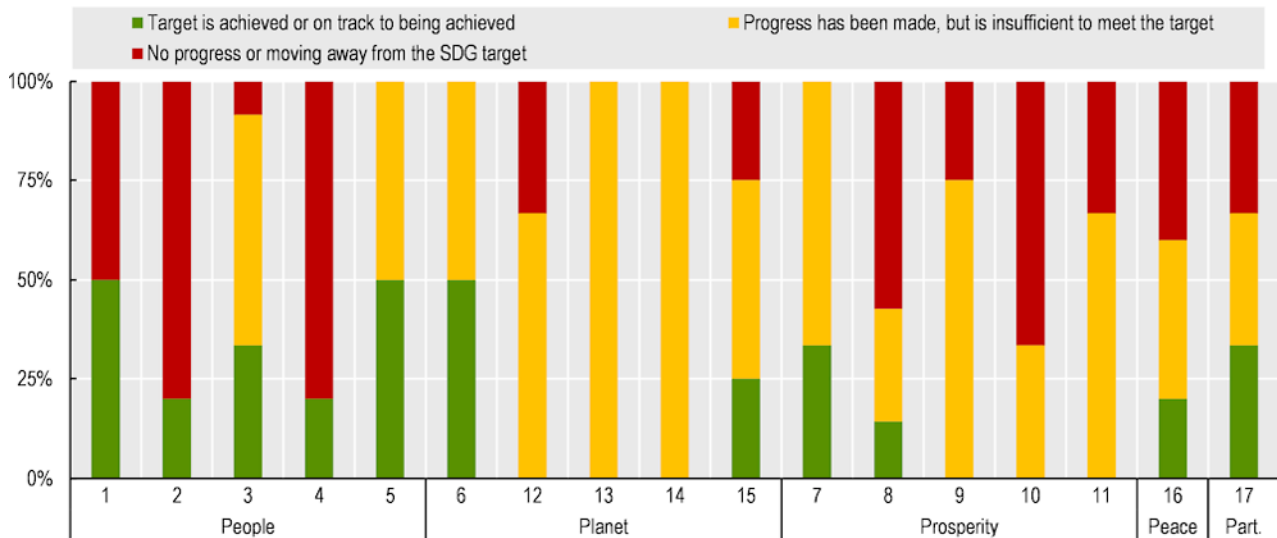
Panel A. Distribution of current distance to Target (percentage of Targets), by goal



¹⁰ https://unfccc.int/sites/default/files/english_paris_agreement.pdf

¹¹ https://www.oecd-ilibrary.org/sites/af4b630d-en/1/3/1/index.html?itemId=/content/publication/af4b630d-en&csp_=5eae7ef40ea2d30f2851336b7c7b3ee2&itemIGO=oecd&itemContentType=book

Panel B. Distribution of trends (percentage of Targets), by goal



Note: Numbers from 1 to 17 stand for the goals: 1 for No poverty, 2 for Zero hunger, 3 for Good health and well-being, 4 for Quality education, 5 for Gender equality, 6 for Clean water and sanitation, 7 for Affordable and clean energy, 8 for Decent work and economic growth, 9 for Industry, innovation and infrastructure, 10 for Reduced inequality, 11 for Sustainable cities and communities, 12 for Responsible consumption and production, 13 for Climate action, 14 for Life below water, 15 for Life on land, 16 for Peace, justice and strong institutions and 17 for partnerships for the goals. These goals are grouped under five broad themes (the “5Ps”): People, Planet, Prosperity, Peace and Partnership. Panel A shows how OECD countries perform, on average, at a given point in time, in terms of their distance from the target level they are supposed to meet by 2030. Panel B shows how OECD countries perform, on average, based on recent developments for the different indicators; it shows the likelihood of meeting the different targets by 2030 based on recent trends. The OECD average is measured as the simple average across OECD countries with available data. Averages for each goal are based on the simple average of the distances across each of the targets pertaining to a given goal. Percentages are computed for the targets with available data – see Future statistical and research agenda on SDGs.

North America is the most important region in terms of R&D investment in green technologies. Europe is the fastest growing region in this area.

4.1.3 Relevant industries

Sectors that help improve air quality, provide access to water resources, transform agricultural production patterns, transform the energy mix, help tackle the climate crisis and contribute to biodiversity conservation will be essential to achieving the SDGs.

4.1.3.1 Growth of the green technology market

Green technologies are in general those that make it possible to mitigate or reverse the impact of human activity on the environment.

Between 2022 and 2030, the compound annual growth rate in the sustainable and green technology market is expected to be 21.6%.¹² This is well above the expected economic growth overall.¹³ It means that the market will increase from \$46.54 billion in 2022 to \$417.35 billion in 2030.¹⁴

4.1.3.2 Sustainable architecture

The largest share of the green economy is accounted for by the construction and renovation of buildings. This involves designing, constructing and managing buildings in a way that minimizes their negative environmental impact. The tools helping to increase the sustainability of buildings include:

- carbon neutral buildings that can produce the same or more energy than they consume,
- the use of durable and renewable materials,
- grass roofs that increase energy efficiency, retain water, absorb heat and help biodiversity in the city,

12 <https://www.precedenceresearch.com/press-release/green-technology-and-sustainability-market#:~:text=The%20global%20green%20technology%20and,forecast%20period%202022%20to%202030>

13 https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histgr.html

14 <https://www.statista.com/statistics/1319996/green-technology-and-sustainability-market-size-worldwide/>

passive design, which focuses mainly on energy savings in heating and cooling.

Minimum energy efficiency standards are also an effective tool. There are certifications for environmentally friendly buildings such as LEED¹⁵, BREEAM¹⁶ and WELL¹⁷.

4.1.3.3 Renewable energy

According to the International Energy Agency, renewables represented over 72% of newly installed energy sources in 2019 and 70% in 2020. China dominated renewable energy investment with \$83.4 billion in 2019, followed by the United States with \$55.5 billion.¹⁸

The potential for growth is increased by the cheapening of technology. According to the IPCC report, the cost per unit of energy produced has decreased between 2010 and 2019 by:

85% for solar energy,

55% for wind power.

The production cost of lithium-ion batteries has been reduced by 85%.¹⁹ The rate of use has increased more than 10 times in the case of solar energy.

4.1.3.4 Transport

Demand for electric vehicles is growing worldwide.

According to the IPCC's 2023 report, the number of electric vehicles increased more than 100 times between 2010 and 2019. In 2021, 16.5 million of them were already in use.

This is reflected in the number of electric vehicles sold. In 2005 it was a few thousand units sold per year, rising to 2.1 million in 2019 and 6.6 million in 2021, corresponding to 10% of the market for cars sold.²⁰ Half (3.3 million) were sold in China, with another 2.3 million in Europe and 630,000 in the United States. Electric cars are not yet doing well in Brazil, India and Indonesia, where they represent less than 0.5% of cars sold.

4.1.3.5 Organic agriculture

According to the Organic Trade Association, organic sales grew nearly 250% from 2002 to 2019, reaching \$55.1 billion in sales. The problem is the declining but still high cost of developing and producing green technologies.

15 <https://www.usgbc.org/leed>

16 <https://bregroup.com/products/breeam/>

17 <https://www.wellcertified.com/>

18 <https://www.statista.com/statistics/799098/global-clean-energy-investment-by-country/>

19 https://report.ipcc.ch/ar6syrr/pdf/IPCC_AR6_SYR_LongerReport.pdf

20 <https://www.iea.org/reports/global-ev-outlook-2022/executive-summary>

if you are interested in the study at full length,
please request it at consult@bitterfly.io