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Appendix 1

SDG Investment Trends Monitor

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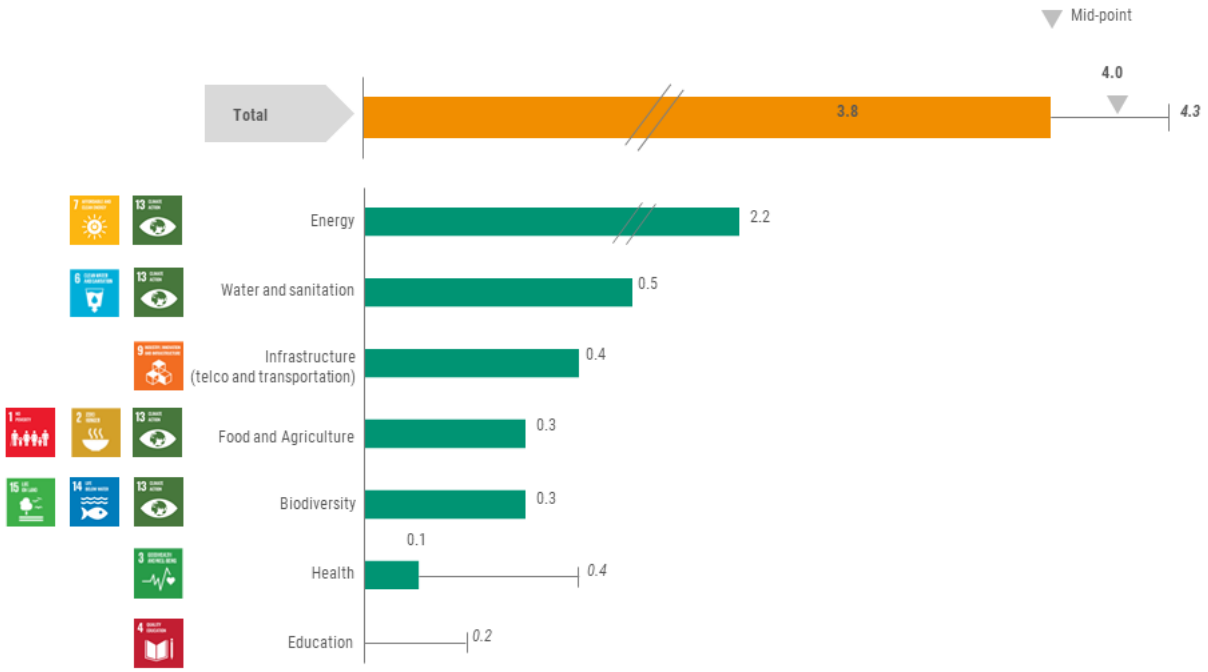
ASSESSMENT OF THE INVESTMENT GAP BY SDG SECTOR



Energy

The investment gap for Energy reported in this analysis is $2,187 billion per year for developing countries. The figures are based on the elaboration of estimates provided by the IRENA World Energy Transitions Outlook 2022 (IRENA, 2022). According to IRENA, the annual global investment need between 2021 and 2030 is about $5.7 trillion, with $1 trillion in fossil fuels and $4.7 trillion in clean energy. Given the current annual expenditure of $1.1 trillion in fossil fuels and $1 trillion in clean energy, the resulting investment gap globally is $3.6 trillion, with a slight reduction of investment in fossil fuels.

One limitation of the IRENA estimate is that it does not provide the geographical breakdown of investment figures. Therefore, the share associated with developing countries – the focus of this study – is not immediately available. However, IRENA provides some regional breakdown of the investment costs for financing the installed capacity needed in renewable generation to achieve the 1.5° scenario by 2050. This information can be used to get a sense of the share of developing countries in the total investment gap in clean energy – conservatively estimated at between 60 and 70 percent based on a re-elaboration of IRENA regional figures.[1] Given this share of investment

[1] According to IRENA, the total investment costs to finance the required capacity in renewable generation until 2050 are around $26 trillion globally, of which 18% pertaining to North America, 14% to Europe, 9% to Latin America, 13% to the Middle East and Africa, 42% to Asia, and 3% to Oceania/Pacific. To obtain the share for developing countries, the aggregate share of Asia, Latin America, and the Middle East

allocated to developing countries, the net investment gap in developing countries is $2.2 trillion annually, with $2.25 trillion in energy transition-related investments and a reduction in fossil fuels by $60 billion.

Looking at the different categories of investment in the energy transition, the total investment gap includes renewable power generation (20 percent), grids and flexibility (10 percent), energy efficiency (52 percent), renewables end uses and district heat (6 percent), electrification (6 percent), and others including hydrogen-based fuels, bio-based fuels, and CCS[2] (6 percent).

As a benchmark, a McKinsey report (McKinsey, 2022) estimates total capital spending on physical assets for the net-zero transition at $9.2 trillion every year between 2021 and 2050, with current spending at $5.7 trillion and the new spending need at $3.5 trillion – closely matching the IRENA-based estimate adopted in this study of a $3.6 trillion investment gap globally.

Another benchmark from the World Energy Outlook (IEA, 2022) estimates that annual $4.2 trillion in clean energy investments are needed for the Net Zero Emissions scenario.[3] Current clean energy investments are estimated at $1.3 trillion, so there is an investment gap of about $2.9 trillion globally. Developing economies account for about $0.6 trillion of current investment (46 percent of global current investment) and for about $2.3 trillion of the investment need (55 percent of global investment need). Thus, the investment gap in clean energy for developing countries would be about $1.7 trillion – around 20% lower than the (IRENA-based) UNCTAD estimate of $2.2 trillion.

Water and sanitation

The investment gap for water and sanitation is $487 billion annually for developing countries. This estimate is based on two studies, a World Resources Institute (WRI) study by Strong et al. (2020) and a World Bank Water and Sanitation Program (WSP) study by Hutton and Varughese (2016).

Strong et al. (2020) estimate the global annual investment need at $1.06 trillion. They also provide a regional breakdown, with developing countries at $730 billion or 69 percent of the total investment need. Hutton & Varughese (2016) report WASH funding needs as just over three times the historical financing trend, thus placing the investment gap at about two thirds of the investment need. Applying this ratio to the $730 billion need from Strong et al. (2020) results in an overall investment gap of $487 billion.

The study by Hutton & Varughese (2016) also estimates the total capital cost of meeting WASH needs at $114 billion. However, WASH needs (SDG targets 6.1 and 6.2) only represent a portion of the overall SDG 6 financing requirements.

Economic infrastructure (transportation and telecommunication)

The investment gap for infrastructure is $373 billion per year for developing countries. This figure includes both investment in transportation and telecommunication, with annual gaps of $208 billion and $165 billion respectively. These figures are based on two studies, a World Bank study by Rozenberg and Fay (2019) for transportation and a World Bank Working Paper by Oughton et al. (2022) for telecommunication.

For transportation, Rozenberg and Fay (2019) estimate an annual investment gap of $417 billion in developing economies, including both capital expenditure (capex) and operational expenditure (opex). It is explained that

and Africa (accounting for 64% of the total) was revised downward to account for the presence of several developed countries in the three regions. This share is conservative because it is based on needs – as available from IRENA – while the ratio of the gap to the need is expected to be higher for developing countries than for developed ones.

[2] Carbon capture and storage.

[3] The Net Zero Emissions by 2050 (NZE) scenario sets out a pathway to stabilize global average temperatures at 1.5°C above pre-industrial levels. The scenario also meets the key energy-related UN SDGs, achieving universal access to energy by 2030 and securing major improvements in air quality.

maintenance costs (opex) match new capital investments (capex), hence the capex investment gap is estimated at 50 percent or $208 billion.

As benchmarks, Lefevre et al. (2016) estimate current transport investments to be between $400 billion and $2.1 trillion globally, and the corresponding investment needs in a range between $2 trillion and $2.3 trillion. Using midpoints, the investment gap is about $400 billion. Furthermore, the Global Infrastructure Outlook report (Global Infrastructure Hub and Oxford Economics, 2017) also estimates transport needs at about $420 billion. These two sources cover only capex, but include all countries. OECD (2017) also assesses global investment needs to be about $2.7 trillion, slightly more than the upper bound estimated by Lefevre et al. (2016).

For telecommunication, the investment gap is estimated at $165 billion based on a World Bank Working Paper by Oughton et al. (2022). The study estimates an annual investment gap of $200 billion (both capex and opex) to meet the UN broadband commission target of achieving universal and affordable access to broadband and online services in developing countries.[4] Upon more granular inspection of the destination of the investment, the capex share is estimated to be just over 80 percent, resulting in a $165 billion investment gap. According to the International Telecommunication Union (ITU), private actors are the main investors in telecommunication infrastructure, with 67% of investments being private (ITU, 2020).

Food and agriculture

The investment gap for food and agriculture is $273 billion annually for developing countries. This figure is based on information from two complementary sources, the Achieving Zero Hunger report by FAO, IFAD, and WFP (2015) and The State of Food Security and Nutrition in the World report by FAO, IFAD, UNICEF, WFP, and WHO (2022).

According to the, relatively dated, pre-Covid report by FAO, IFAD, and WFP (2015), the annual investment gap to eradicate extreme poverty and hunger is estimated at $265 billion annually from 2016 to 2030, with a projected 650 million people suffering from hunger in 2030. However, the latest estimate from FAO, IFAD, UNICEF, WFP, and WHO (2022) increases the 2030 projection to nearly 670 million people, a 3% increase. Accordingly, this analysis revises the investment gap upward to $273 billion.

Biodiversity

The investment gap for biodiversity is $307 billion annually for developing countries. This figure is based on UNEP (2022). It includes the cost of capital investment in nature-based solutions (NbS) such as marine protected areas, restoration of peatlands and salt marshes, and natural forest conservation.

UNEP (2022) sets the investment gap for NbS by 2050 at $400 billion annually, including $165 billion in G20 countries and $235 billion in non-G20 countries. Adding back the G20 countries that are part of the grouping of developing countries, the investment gap in developing countries (proxied) becomes $307 billion or 77 percent of the total investment gap.

As a benchmark, a study by Deutz et al. (2020) estimated the global biodiversity investment gap to be $711 billion, ranging between $598 billion and $824 billion. This estimate is higher than the estimate by UNEP (2022), and the disparity could be attributed to several factors. Firstly, Deutz et al. (2020) encompasses non-capital investments such as subsidies and biodiversity offsets. Secondly, the figure is a global estimate and not specific to developing countries – the focus of this study. Another report by OECD (2020) provides estimates of actual biodiversity financing but does not provide a comparable figure for the investment need and gap.

[4] Estimated as $2 trillion over a decade, hence $200 billion annually.

Social infrastructure (health and education)

The investment gap for social infrastructure (health and education) reported in this study falls in a large range, between $100 billion to $600 billion annually for developing countries. The wide range reflects the uncertainty regarding the size of the capex component as a share of the total financing gap.

For health, the investment gap ranges from $100 billion to $400 billion. This figure is based on two studies, a WHO study by Stenberg et al. (2017) and a World Bank study by Kurowski et al. (2021).
In a pre-Covid scenario, Stenberg et al. (2017) estimated the financing gap at $274 billion under a conservative progress scenario and $371 billion under a more ambitious scenario in which most low-income and middle-income countries achieve SDG 3 targets. The midpoint estimate ($323 billion) is then revised upward to account for the impact of Covid-19 based on a later study by Kurowski et al. (2021), resulting in a financing gap of about $400 billion, including both capex and opex. Based on a high-level breakdown of the cost components, it can be assumed that at least $110 billion – 25% of the total $400 billion – is capex, representing a lower bound.

For education, the investment gap is up to about $200 billion annually for developing countries. This figure is based on the 2020 UNESCO Education Monitoring Report (UNESCO, 2020). According to the report, the financing gap to achieve SDG 4 is $186 billion (ranging between $178 billion and $193 billion) post-Covid-19, mostly concentrated in developing countries. The report does not provide any information to derive the split between capex and opex, but it is expected that opex will be prominent in the education sector. Accordingly, the gap in capital investment is set between zero as lower bound and $186 billion as the upper bound.

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SDG Investment Trends Monitor

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For further information, please contact
Mr. James X. Zhan
Director
Investment and Enterprise Division UNCTAD

diaeinfo@unctad.org +41 22 917 57 60

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