

Financing Sustainable Urbanization: Counting the Costs and Closing the Gap

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Illustration of skyscraper and over bridge in urban infrastructure. © Vectormart /Shutterstock

Summary

As urbanization has placed a majority of the world's population, GDP and greenhouse gas emissions in urban areas, it is increasingly true that the battle for sustainable development will be won or lost in cities. While we know that cities can be drivers for the achievement of Agenda 2030, lack of sufficient finance for investment in infrastructure and sustainable development prevents urban populations from reaching their full potential and increases the overall costs of municipalities. One obstacle for unleashing adequate finance is that there is a lack of understanding on the basic costs of a city. This necessitates a comprehensive costing estimation for SDG 11 on sustainable urbanization. There is also a lack of capacity to cover such costs, partly stemming from inadequate awareness of the total financing capacity currently available and how to access it. This report presents an innovative pilot on how to count the costs for achieving SDG 11 developed by UN-Habitat and AidData. It furthermore presents UN-Habitat estimations on the total SDG and infrastructure investment gap as well as the total private and public financing capacity available. Finally, the report discusses possibilities for bridging the investment gap for SDG 11 and urban infrastructure, with a special emphasis on how local governments can access the currently underutilized institutional investor capacity.

Introduction

In 2015, the world adopted the 2030 Agenda for Sustainable Development, agreeing on a shared blueprint for peace and prosperity for people and the planet. At its heart are the 17 Sustainable Development Goals (SDGs) and its 169 targets, which are an urgent call for action by all countries in global partnership. They recognize that ending poverty and other vulnerabilities must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our ecosystems (UN, 2019a). Agenda 2030 is now on its last decade and substantial finance is needed to achieve all SDGs on time. The global development agenda's graduation from the Millennium Development Goals (MDGs) to the SDGs imposed more demands on available resources and established the need to mobilize additional resources through leveraging private investments and increasing local revenue generation capacity. Furthermore, the Addis Ababa Action Agenda agreed upon by states in 2015 constitutes a strong foundation to support the implementation of the 2030 Agenda for Sustainable Development. It provides a new global framework for financing sustainable development by aligning all financing flows and policies with economic, social and environmental priorities. The different action areas include a variety of financial sources, from domestic public to international and national private business and finance, debt instruments and official development assistance.

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This report builds on the joint UN-Habitat/AidData project "Counting the Costs" (Prakash, Cheng, Kamiya & Schaedel 2020) and the UN-Habitat (2020) estimation on the Sustainable Investment Gap.

Despite the commitments made in these agendas, there is a gap between the investments made and those needed to successfully achieve the SDGs and provide adequate infrastructure. In emerging markets and developing countries, it has been reported that only about half of SDG investment needs are being covered (UNEP Finance Initiative, 2018). As many developing countries face tremendous fiscal constraints, it becomes a challenge for them to secure a stable source of funding, resulting in underinvestment of critical infrastructure. While this investment gap for infrastructure and the SDGs is evident, there is a lack of compiled cost numbers for the last 10 years of Agenda 2030. In the light of this, there is a need to quantify the SDG and infrastructure investment needs until 2030.

The total Infrastructure and SDGs Investment Gap

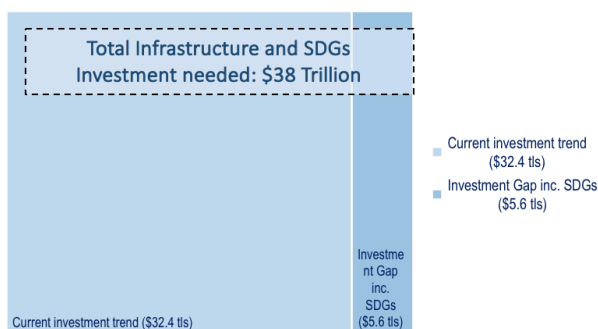
To account the total financing needs for infrastructure and the achievement of all SDGs, UN-Habitat has developed an estimation quantifying the total investment needed by compiling numbers from multiple sources (UN-Habitat 2020). The main data source is the Global Infrastructure Outlook (G20, 2018), which builds on a top-down econometric approach using panel data to draw inferences on infrastructure investment. The Global Infrastructure Outlook depends on two forecasts:

1. The projections in infrastructure investment under the assumption that countries continue to invest in line with current trends, with growth occurring only in response to changes in each country's economic and demographic fundamentals.
2. An investment need forecast to demonstrate the investment that would occur if countries were to match the performance of their best performing peers, after controlling for differences in the characteristics of each country.

The global totals in the Global Infrastructure Outlook were estimated by scaling up results from a sample of 50 countries included in the study using GDP shares. Forecasts of the investment required to meet the SDGs connected to universal access to electricity, water and sanitation were calculated for low- and middle-income countries where access is currently less than 100 percent (G20, 2018). To add robustness to this UN-Habitat estimation, the Global Infrastructure Outlook results were then cross-referenced with data from the McKinsey Global Institute (2016), United Nations Sustainable Development Solutions Network (UNSDSN, 2019) and UNCTAD (2014) to affirm the total investment gap.

Results from this UN-Habitat estimation (see graph 1) show that the total investment needed for infrastructure and the SDGs is estimated at \$38 trillion for the years 2020-2030.

Graph 1: Total infrastructure and SDGs investment needed and the current investment gap.



Source: UN-Habitat (2020)

Cities: Infrastructure Investment plus SDGs (2020-2030)

Note: Approximate figures 2020-30 integrating institutional reports, see references.

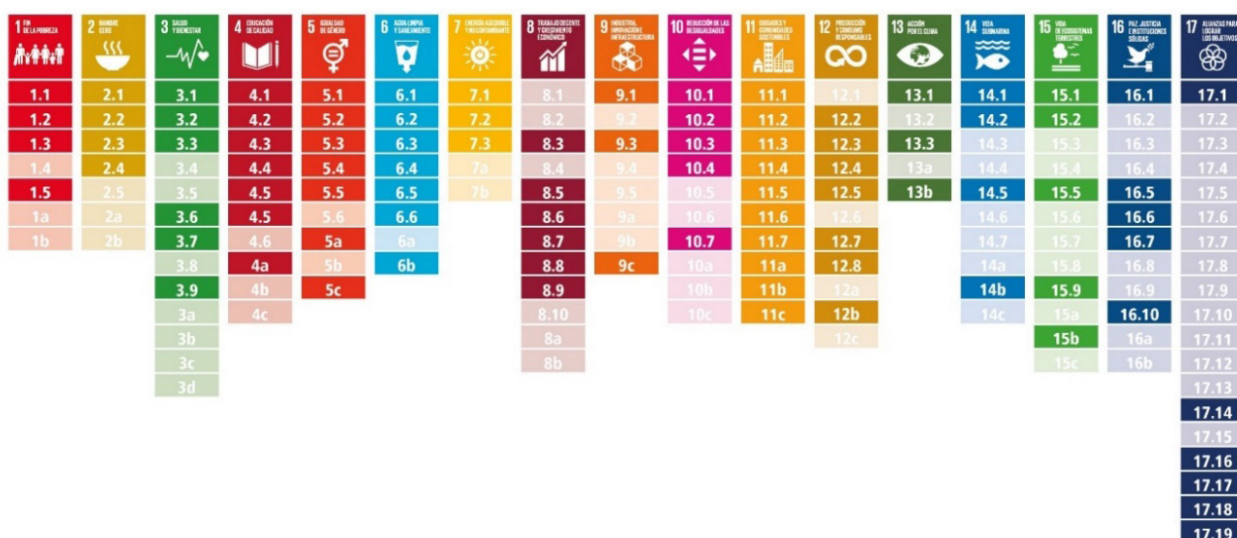
SDG 11 and the Investment Gap

This investment need is not least pronounced with regards to SDG 11 – “Supporting Cities and Communities”. While the SDGs are global, their achievement depend on the ability to make them a reality in cities and regions. As outlined in the Synthesis Report of the UN Secretary General (2014), “many of the investments to achieve the sustainable development goals will take place at the subnational level and be led by local authorities.”

All the SDGs have targets related to the responsibilities of local and regional governments, particularly to their role in delivering infrastructure and basic services. As much as 65 percent of the SDG agenda may not be fully achieved without the involvement of urban and local actors (UNSDSN, 2016). Around 55% of the world's population today live in urban areas and the share is expected to increase to 68% by 2050, followed by an increase to around 75 % by 2100.

Projections show that urbanization combined with the overall growth of the world's population could add another 2.5 billion people to urban areas by 2050 (UNDESA, 2018). This increasing urbanization leaves more and more people dependent on urban infrastructure systems. Many urban populations live in hazard-prone areas in coastal zones affected by climate change and cities face increasing challenges in funding resilience for their inhabitants. Furthermore, a clear majority of global GDP, as well as global greenhouse gas emissions, can today be attributed to cities (OECD, 2012). Indeed, urbanization has led to some of the world's greatest development challenges, but it also constitutes a tremendous opportunity for advancing sustainable development. Concentrating sustainable development efforts in cities is not only a practical imperative, it is also a strategic choice. Urban areas occupy a tiny proportion of the global land mass but have a disproportionate impact on development that can be leveraged for large gains in the fight against poverty, inequality and climate change (UNSDSN, 2016).

Figure 1. Around 65% of the SDG goals are linked to territorial and urban development.



Source: UN-Habitat.

With the targets set out in SDG 11 and the New Urban Agenda (NUA), there is a roadmap for how to make urbanization sustainable. While substantial progress has been made in reducing the proportion of the global urban population living in slums, still more than 1 billion people live in such situations today. A majority of urban residents are breathing poor-quality air and have limited access to transport and open public spaces. The proportion of urban residents who have convenient access to public transport remains low, particularly in developing countries. In 2018, around half of the world's urban population lacked convenient access to public transport (UN, 2019b). Furthermore, 2 billion people lack access to waste collection services and 3 billion people to controlled waste disposal facilities. Amid rising income levels and rapid urbanization, it is estimated that the total waste generated in the world will double from nearly 2 billion tons in 2016 to about 4 billion tons by 2050 (UN, 2019a). Meanwhile, a lack of adequate planning in some places has led to urban sprawl which threatens sustainable development.

There are important positive spillover effects from investing in urban infrastructure and services and investment in SDG 11 has a synergistic relationship with other SDGs. Thus, investment in SDG 11 is beneficial for the achievement of the other SDGs (UNECA, 2019). There are linkages between good urbanization and job creation, livelihood opportunities, and improved quality of life. While we know that cities can be drivers of the achievement of Agenda 2030, lack of sufficient finance for investment in infrastructure prevents urban populations from reaching their full potential and increases the overall costs of municipalities. One obstacle for unleashing such finance is the lack of comprehensive costing estimations for SDG 11.

Counting the Costs for SDG 11: A New Approach

In the absence of quantifiable information on the costs of implementing SDG 11, it is difficult for leaders to accurately assess what resources are needed, or identify shortfalls, and how to address them. The challenge is exacerbated for city leaders in developing countries, who bear the burden of local infrastructure and service delivery, all the while operating in data constrained environments with limited resources at their disposal. Estimating financing needs for the SDGs is complex and necessarily imprecise since estimates always rely on a host of assumptions, including the macroeconomic environment, the shape of national and international policies, advances in technology, the predicted impacts of shocks, stresses and climate change, and the extent to which investments in one area have spillovers in others.

The costing methodology presented here, jointly developed by UN-Habitat and AidData (Prakash, Cheng & Kamiya, 2020), is bottom-up to account for differing needs of large, midsize and small cities, as well as the price differences for service delivery. While previous studies have accounted aggregated costs for the costs of roads, buses and so on, this estimation also includes invisible costs such as those associated with planning. The aim with this study is to produce estimates and tools that can be updated on a regular basis in the lead up to 2030 and are equally relevant to stakeholders working at the local, national and international levels.

In this estimation, costs are estimated for local infrastructure rather than for basic infrastructure. As opposed to basic infrastructure, local infrastructure involves costs on service provision for local inhabitants. This means infrastructure provided by local government authorities for their inhabitants. The main difference between basic and local infrastructure is thus that *basic* infrastructure is both within and outside of the mandate of the local government, whereas *local* infrastructure is solely the mandate of the local government (World Bank, 2012).

Determining the cost of achieving SDG 11 on sustainable cities and communities by 2030 needs a systems approach. For instance, a city's transportation system comprises several moving parts: policy leadership; transportation planning department; public transit network of metros, buses and intermediary public transport; network operators; construction crew and maintenance personnel. Similar arguments can be made for other systems that are critical for a city's sustainable functioning. The most visible costs are those incurred in the development of infrastructure and its operation, such as roads, buses and bus drivers. Previous studies have done well in estimating the aggregate spending required by 2030 on these visible needs. However, for cities to pursue growth sustainably, there is a need to also account for those costs that are less visible like a city's transport planning department, who are crucial in ensuring universal transit access through better routing design. This study evaluates the SDG 11 targets, classifying them into five categories for costing:

1. Housing
2. Transportation
3. Waste Management
4. Public Spaces
5. Urban Governance and Planning

Distinct parts of each system are clearly identified through expert consultations and research, along with their interconnectedness. This serves two purposes: (1) input costs can be adjusted to account for co-benefits for accuracy; and (2) targets whose achievement is linked to progress on others are identified.

Developing a methodology to cost the achievement of SDG 11 with a bottom-up approach is challenged by the varying nature and needs of cities worldwide. To ensure this study's methodological robustness as well as alignment with the needs of the urban community, it was divided into two phases. The first phase is aimed at learning lessons on two fronts: (1) what would an achieved SDG 11 by 2030 look like; and (2) how do you contextualize the costs to different countries. For the first phase, the study attempted to conduct the costing for six pilot countries: Cote d'Ivoire, India, Malaysia, Colombia, Bolivia and Sweden. In consultation with experts, a hybrid approach was deemed to be the best way forward. This approach first establishes aspirational benchmarks for 2030 based on the systems analysis discussed in the previous section. Then, gaps are measured at the city level between 2019 and the aspiration for 2030 for a selection of cities in the six countries. This city selection was based on a stratified sampling approach to try and offer generalizable information, while being resource feasible. Criteria, such as population (large, medium and small cities) and consumer price index, were used to ensure the sample's representativeness. Further, price data was gathered for each of the identified inputs for each city through primary data collection. For the targets that are hard to measure (such as expenditure on road safety education), the study relies on evaluation of spending by developed countries (e.g. Sweden, US, UK) and applies an adjusted cost at the national level. Adjustments to the data are made to correct for outdated data where no up-to-date data is available, both on the gaps statistics, using projection methods, and on price statistics, using economic measures such as inflation and GDP growth rates. Each of the costs are then classified as a fixed (one-time) or a recurring (annual) cost, which is needed to estimate the total resources needed in the lead up to 2030.

There are some mentionable caveats on the methodology. For some of the sample countries, such as Bolivia and Malaysia, the methodology was slightly altered due to lack of data or other context-specific circumstances. One important insight from this study is that there is no one size that fits all for a costing methodology such as this one. The approach for how to count the costs will have to be slightly alternated for different countries. Furthermore, the strength of estimation for each country depends on the amount of data available on city level.

What Does a Sustainable City Cost?

Results for average annual cost of achieving SDG 11 from 2019-2030 are found for four countries in our sample; Bolivia, India, Malaysia and Colombia. From our original sample, there was not enough reliable data for Cote d'Ivoire to estimate costs, so the country was dropped from the sample. Sweden was also dropped from the sample due several uncertainties surrounding the data.

For the four countries remaining, estimations are presented. These results should be interpreted keeping in mind that the sample size is still small for this costing estimation. In total, 129 cities of varying scale are included in the final sample. The results for average annual costs of a sustainable city are presented below, stratified in tables per city size. The first table presents the average annual cost for small cities, consisting of cities with less than 100 000 inhabitants. The total number of cities in this stratum is 40. In the second table, results for the sampled medium-sized cities, containing between 100 000 and 1 000 000 inhabitants, are presented. In this stratum, the total number of cities are 66. Finally, in the third table, results for the large cities, containing over 1 000 000 inhabitants, are presented. For the third stratum, the total number of cities is 23. An important note about these strata is that some cities move from one stratum to another as their population is forecasted to grow. To exemplify, El Alto in Bolivia is predicted to go from being a medium-sized to a large city by 2024, thus impacting the estimation of average annual cost for large Bolivian cities from that year.

Results from the four sampled countries show that the total average annual cost for small cities to achieve SDG 11 ranges from \$18 million USD in Malaysia to \$54 million in Bolivia. For medium-sized cities, the total average annual cost ranges from \$144 million in India to \$516 million in Malaysia. For the large cities sampled, the total annual averages range from \$645 million in Bolivia to \$5286 million in Malaysia. Furthermore, there are varieties within the different cost categories (transport, public space, etc.) among the countries. This preliminary study thus points to the fact that different countries will have different investment needs depending on country-specific characteristics. This study however indicates that for a small city in a developing country, total average annual costs can be expected of around \$20-50 million. For a medium-sized developing city, the costs range from around \$140 million to more than \$500 million. Large developing cities can expect an average annual cost from around \$600 million to over \$5000 million, with most country average results being in billions of USD per city and year.

Table 1: Estimated Average Annual Cost for Achieving SDG 11 in Small Cities (<100k Inhabitants). Millions of USD.

| Average Annual Cost for Small Cities (<100k Inhabitants) | | | | | | | |
|--|-------------|-----------------------|------------|-------------|--------------|-------------------------|------------|
| | Sample Size | Housing - Public Cost | Transport | Solid Waste | Public Space | Governance and Planning | Total |
| Bolivia | 8 | \$ m 18.81 | \$ m 29.13 | \$ m 0.63 | \$ m 4.36 | \$ m 1.36 | \$ m 54.29 |
| India | 7 | \$ m 4.70 | \$ m 9.38 | \$ m 1.69 | \$ m 17.82 | \$ m 0.84 | \$ m 34.43 |
| Malaysia | 7 | \$ m 0.06 | \$ m 16.43 | \$ m 0.18 | \$ m 0.09 | \$ m 1.72 | \$ m 18.48 |
| Colombia | 18 | \$ m 15.44 | \$ m 19.26 | \$ m 0.38 | \$ m 2.79 | \$ m 1.09 | \$ m 38.96 |

Table 2: Estimated Average Annual Cost for Achieving SDG 11 in Medium-Sized Cities (100k – 1 Million Inhabitants). Millions of USD.

| Average Annual Cost for Medium-Sized Cities (100k – 1 Million Inhabitants) | | | | | | | |
|--|-------------|-----------------------|-------------|-------------|--------------|-------------------------|-------------|
| | Sample Size | Housing - Public Cost | Transport | Solid Waste | Public Space | Governance and Planning | Total |
| Bolivia | 11 | \$ m 79.50 | \$ m 62.90 | \$ m 3.49 | \$ m 40.40 | \$ m 4.66 | \$ m 190.95 |
| India | 18 | \$ m 16.28 | \$ m 42.74 | \$ m 9.30 | \$ m 72.66 | \$ m 2.81 | \$ m 143.79 |
| Malaysia | 12 | \$ m 23.43 | \$ m 424.05 | \$ m 3.69 | \$ m 58.75 | \$ m 5.88 | \$ m 515.80 |
| Colombia | 25 | \$ m 107.30 | \$ m 202.17 | \$ m 2.91 | \$ m 26.81 | \$ m 3.71 | \$ m 342.90 |

Table 3: Estimated Average Annual Cost for Achieving SDG 11 in Large Cities. (>1 Million Inhabitants). Millions of USD.

| Average Annual Cost for Large Cities (>1 Million Inhabitants) | | | | | | | |
|---|-------------|-----------------------|--------------|-------------|--------------|-------------------------|--------------|
| | Sample Size | Housing - Public Cost | Transport | Solid Waste | Public Space | Governance and Planning | Total |
| Bolivia | 1 | \$ m 308.73 | \$ m 259.98 | \$ m 14.54 | \$ m 47.81 | \$ m 13.60 | \$ m 644.66 |
| India | 17 | \$ m 397.28 | \$ m 626.01 | \$ m 167.26 | \$ m 817.37 | \$ m 8.22 | \$ m 2016.14 |
| Malaysia | 1 | \$ m 27.48 | \$ m 1617.58 | \$ m 26.16 | \$ m 3597.22 | \$ m 17.37 | \$ m 5285.81 |
| Colombia | 4 | \$ m 1324.57 | \$ m 1503.96 | \$ m 49.68 | \$ m 217.05 | \$ m 10.88 | \$ m 3106.14 |

It should be noted that this methodology has thus far only been tested on a limited sample, why results are yet to be proven statistically significant. Following this, the authors refrain at this stage from drawing too large conclusions. However, this costing estimation constitutes an important contribution as it has developed a methodology that now can be used for larger studies. Such larger studies would enable cross-country comparison and allow more generalizability of results from sampled cities to other cities in similar countries. Such results could be combined with data over the total number of cities per size a country has, to deduct the total cost per country to achieve sustainable urbanization. In other words, this study has opened the door for how to count the costs of achieving SDG 11. As UN-Habitat and AidData continue this important work, further analysis can be expected in future publications.

Financing SDG 11

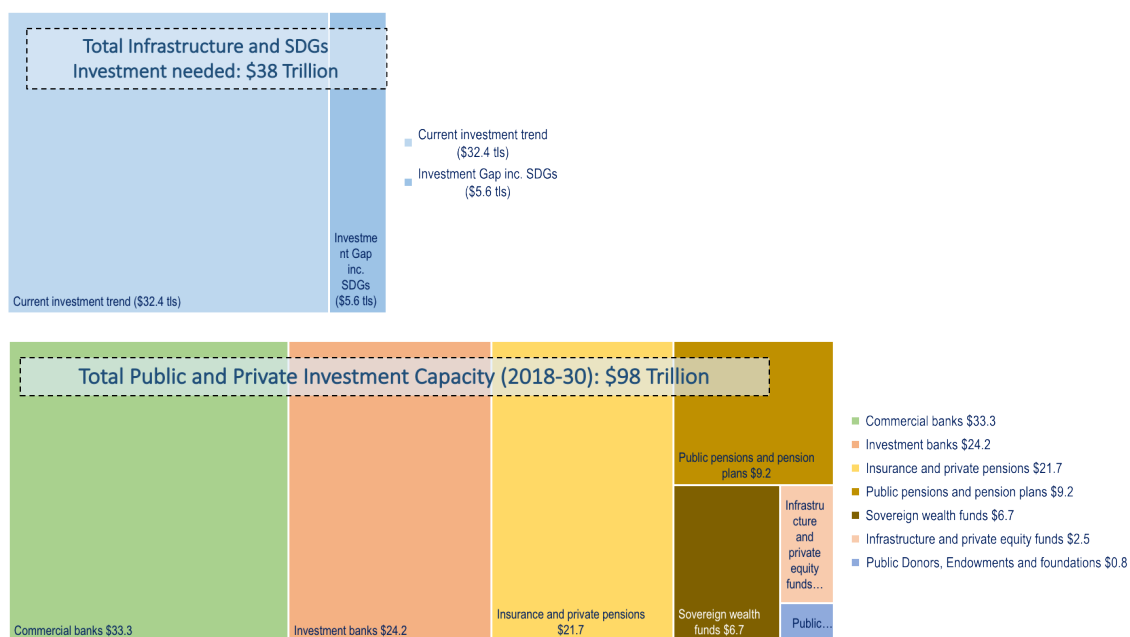
Successful achievement of SDG 11 requires substantial finances for countries across the world. The current investment gap proves that there is an urgent need to utilize new financing tools for cities' development. Other than traditional source of subnational funding, such as taxes, fees and intergovernmental transfers, cities can use a range of public finance instruments and tools to support sustainable infrastructure. An evolving landscape of financing offers many opportunities to mobilize resources,

including public, private, domestic, international and experimental schemes. New development partners, finance institutions, public-private funds, philanthropic organizations and private impact investors have emerged or expanded their activities in recent years and now work actively alongside traditional donors (UNDP, 2018).

To showcase the full capacity from global financial actors, UN-Habitat has compiled an estimation quantifying the total public and private investor assets (UN-Habitat 2020). The estimation relies on several sources on available private and public investment. Data on available public and private investment comes mainly from the McKinsey Global Institute (2016) and was adjusted to the years 2020-2030. This data was then supplemented with data from the Sovereign Wealth Fund Institute (2019), the IMF (2016) and the OECD (2014). This was then further complemented with data on available public financing, including donors and UN agencies, from the Dag Hammarskjöld Foundation (2019) and the OECD (2019) to estimate the total investor capacity.

Results from this UN-Habitat estimation show that while there is a large SDG and infrastructure investment need, the total public and private investment capacity far surpasses the total investment gap.

Graph 2: Total infrastructure and SDG investment needed, the current investment gap, as well as total public & private investor capacity.



Source: UN-Habitat (2020).

As can be seen in Graph 2, the total investment need for infrastructure and the SDGs is estimated at \$38 trillion for the years 2020-2030, with the total investment gap being \$5.6 trillion. However, the total public and private investment capacity is significantly larger, totalling \$98 trillion. Commercial banks have an investment capacity of more than \$33 trillion, which is almost as large as the total investment need for 2020-2030. Investment banks manage over \$24 trillion, while insurance companies and private pensions manage almost \$22 trillion. The world's 82 largest sovereign wealth funds jointly manage over \$6.7 trillion and remain largely underutilised for realising sustainable development. An important conclusion to draw is that infrastructure & private equity funds, totalling at

\$2.5 trillion in managed assets, by themselves lack the capacity to close the current investment gap. Another important conclusion to draw is that while public donors, endowments and foundations do not make up more than \$0.8 trillion, institutional investors together manage assets that far exceed the total investment gap until 2030. Traditional financing is not enough to cover the investment gap, but combined institutional investor assets constitute a possibility to closing it completely. In other words; while funding indeed does exist, it is currently not flowing into the right areas to close the SDG and infrastructure investment gap. Redirecting even a part of these assets would make a significant difference.

Graph 3: Infrastructure and SDG investment gap, as well as total public & private investor capacity.



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