



# Private Participation in Infrastructure (PPI)

## 2021 Annual Report



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## Acknowledgement & Disclaimer

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This report describes private participation in infrastructure (PPI) as indicated in the Private Participation in Infrastructure Database. The database records investment information for infrastructure projects in low and middle income countries globally. The PPI Database represents the best efforts of a research team to compile publicly available information, and should not be seen as a fully comprehensive resource. Some projects, particularly those involving local and small-scale operators, tend to be omitted because they are usually not reported by major news sources, databases, government websites, and other sources used by the PPI Projects Database staff.

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# Foreword

As the world enters the third year of the COVID-19 crisis, we see that aggregate output in low- and middle-income countries rebounded in 2021, after a sharp decline in 2020. Many middle-income countries have recorded substantial vaccination rates, and international trade has picked up. Along these lines, private participation in infrastructure (PPI) investment commitments in 2021 also bounced back from their historic lows in 2020.

Despite all these positive notes, we see a number of daunting challenges ahead for the global economy, particularly for developing countries. The infrastructure investments outlook is dampened by a sharp rise in policy uncertainty and an escalation in geopolitical tensions, especially, in Europe and Central Asia. While writing this report, we have also found that recovery from the deep recession triggered by the COVID-19 pandemic has been uneven, leaving some regions behind. Worse, as economic stimulus slows and credit conditions tighten, there will be stronger headwinds on the private sector playing a more active role in filling the infrastructure gap.

We expect 2022 to be a pivotal year because it offers important opportunities to ensure that we make real progress in the post-pandemic recovery. On this note, the PPI Database team will continue to closely monitor and report on the post-pandemic trend of private infrastructure investment commitments.

# Key Highlights

Investment commitments of  
**US\$76.2 Billion in 240 projects in 2021**

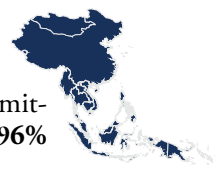
↑ 49% from 2020

↑ LAC posted investments with commitments of **US\$18.6 billion**, a 22% increase from 2020.



PPI in this region decreased by 21% in comparison to the previous five-year average.

↑ EAP posted investment commitments of **US\$28.1 billion**, a 196% increase from 2020.



While the region usually out-invests others, it was 21% below its past five-year average.

↑ ECA saw investment commitments of **US\$15 billion**, a 300% increase from 2020.



It is also a 100% increase from the past five-year average.

↓ SSA received **US\$5.2 billion**, a 17% decrease in investment levels from 2020.



It is about the same level with the past five-year average.

↓ SAR had the second highest commitments in 2020, but commitments fell by 16% in 2021 to **US\$8.6 billion**.



This is also 12% lower than the past five-year average.

↓ MENA, one of two regions to mark an increase in 2020, fell to **US\$626 million**, a 90% decrease.



This is also a 81% decrease from the past five-year average.



The **transport** sector outpaced the energy sector in 2021, posting **US\$43.8 billion** across **82 projects**, accounting for **58% of global PPI investments**.



**Renewable energy** continued to dominate the energy generation market (**95% of the projects**). The most popular form of renewable technology was **solar PV**.



Investment commitments in the **energy sector** totaled **US\$22.4 billion** across **102 projects**, a **26% decrease** from 2020 levels.



The **water and sewerage** sector, which usually posts low investment levels, had its **highest commitment in a decade** at **US\$9.9 billion** (**13% of total PPI**).



**20 projects** were in **IDA countries** at **US\$3.3 billion**, a **42% decrease** from 2020.

**DEFs** played a critical role in continuing investment commitments in **IDA countries**.

**12 out of 20 IDA projects** received some form of **DEFI support**.



Of investments with financing information, investment was largely debt driven, **accounting for 64% of total investment**.

**28%** of total investment came from commercial sources in 2021, while international debt financed **38%** of total investment commitments.

# Executive Summary

- Private investment commitments in low- and middle-income countries<sup>1</sup> in 2021 totaled US\$76.2 billion across 240 projects, representing 0.26 percent of the total gross domestic product (GDP) across all such countries.<sup>2</sup> Private sector investment commitments increased by 49 percent from 2020, showing clear signs of recovery. However, the commitments were still 12 percent lower than the previous five-year average (2016-2020).
- Recovery from the deep recession triggered by the COVID-19 pandemic has been uneven in different regions. PPI recovery in 2021 was mainly led by three regions: East Asia and the Pacific (EAP), Latin America and the Caribbean (LAC), and Europe and Central Asia (ECA).
- Private investment commitments in the Middle East and North Africa (MENA), and South Asia (SAR) decreased even further compared to 2020 levels. PPI investments in Sub-Saharan Africa (SSA) stayed around the same level as the past five years' average but saw a decrease of 12 percent compared to investment levels in 2020.
- Fourteen International Development Association (IDA)<sup>3</sup> countries received investment commitments, amounting to US\$3.6 billion across 20 projects in 2021. This represented a 41.5 percent decrease in investment levels compared to 2020, and a 38 percent lower investment level than the five-year average of US\$5.8 billion.
- The transport sector led the recovery, outpacing the energy sector with US\$43.8 billion in investments. Despite the ongoing pandemic and the emergence of new variants, PPI in transport bounced back sharply, with increases across every region except for MENA. This marks a return to the historic trend across PPI in the last decade, unlike 2020, when the beginning of the pandemic brought transport infrastructure investment to a near standstill.
- The PPI recovery was green in the energy sector. Ninety-five percent of electricity generation projects were renewable, compared to 90 percent the previous year. This is equivalent to 72 percent by total investment, up from 63 percent (the previous five-year average, 2016-2020). In terms of added capacity, 2021 saw 71 percent of new energy generation taking place in the form of renewables compared to 61 percent on average over the 2016-2020 period.
- With respect to financing,<sup>4</sup> approximately 18 percent (US\$3.8 billion) came from public sources, 63 percent (US\$13.5 billion) came from private sources, and 19 percent (US\$4.0 billion) came from development and export finance institution (DEFI) sources. There was a slight increase in private sources of financing in 2021 as compared to 2020, which saw 59 percent of investment from private sources and 24 percent from DEFIs. This upturn in private financing coincides with the general pandemic recovery seen this year.

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1 The word "investment" refers to private investment commitments (at the time of financial close) in energy; transport; water supply and sanitation; municipal solid waste; and internet and communications technology-backbone (ICT-backbone) projects serving the public in low- and middle-income countries, including natural gas transmission and distribution, but excluding oil and gas extraction. ICT-backbone infrastructure includes fiber optic cables, mobile towers, and other hard assets with an active government component.

2 2020 World Bank GDP (current U.S. dollars) value has been used because GDP 2021 was not yet available at the time of the writing of this report.

3 IDA countries are those eligible for support from the IDA, which is the part of the World Bank that helps the world's poorest countries (<http://ida.worldbank.org/>).

4 In 2021, detailed financing information was available for 47 percent of projects (85 projects), amounting to 33 percent of PPI projects by investment value (US\$21.3 billion out of US\$65.6 billion).



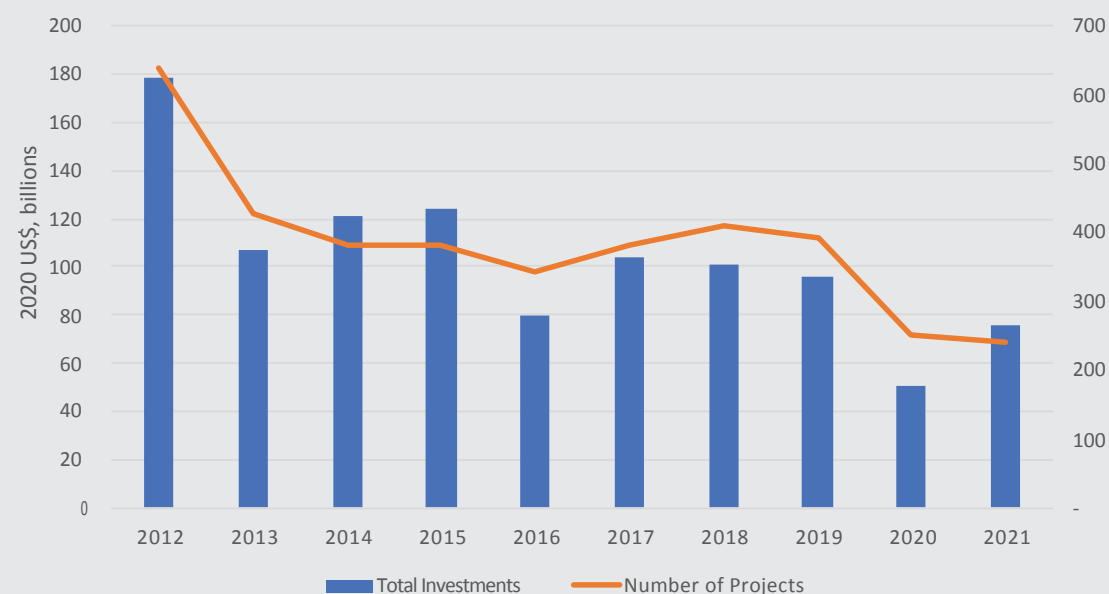
# 1. Overview

PPI investment in 2021 accounted for US\$76.2 billion across 240 projects, representing 0.26 percent of the GDP of all low- and middle-income countries.<sup>5</sup> This represented an increase in investment commitments compared to the US\$51.0 billion raised across 251 projects in 2020, and an indication of larger project ticket sizes in 2021 (240 projects) compared to 2020 (251 projects), as detailed below. Private sector investment commitments increased by 49 percent from 2020, showing clear signs of recovery. However, the 2021 commitments were still 12 percent lower than the previous five-year average (2016-2020).

The number of projects declined by 4.4 percent from 2020 levels (Figure 1). Despite the lower number of projects compared to 2020, more countries reported PPI projects in 2021. There were 50 countries with PPI investment commitments in 2021, up from 45 countries in 2020. Of the 50 countries with PPI projects, 19 were in Sub-Saharan Africa, the most of any region.

**FIGURE 1**

Investment Commitments in Infrastructure Projects with Private Participation in Low- and Middle-Income Countries, 2012-2021



The average (mean) project size in 2021 (US\$325.7 million) was significantly higher than the average project size in 2020 (US\$204.7 million), as was the median project size—US\$105 million in 2021, versus US\$79 million in 2020.

<sup>5</sup> 2020 World Bank GDP (current U.S. dollars) value has been used because GDP 2021 was not yet available at the time of the writing of this report.

Greenfield projects continued to dominate in 2021, accounting for 61.5 percent of all PPI investments. This increase in greenfield projects was due to the substantial increase in greenfield transport sector projects. Similarly, in 2021, the trend of increasing greenfield investments in the energy sector was noted, with 54 percent greenfield projects in the energy sector and 62 percent brownfield investments in the transport sector.

By absolute value, brownfield investments increased substantially, to US\$12.4 billion in 2021, up from US\$5.1 billion in 2020. This uptick was due to the substantial increase in water sector projects. In 2021, 25 water transactions were recorded as management contracts, close to the 24 in 2020, attributed to the continued rise of municipal solid waste projects. There were four divestitures in 2021.

### **Domestic Versus Foreign Sponsors**

Of the 240 projects recorded in 2021, 67 projects (28 percent) had a majority of their stakes held by foreign entities. Compared to the 44 percent in 2020 for the same category, this represented a decrease. Out of the 67 projects with foreign sponsors, 48 were energy projects, (73 percent of the 67).

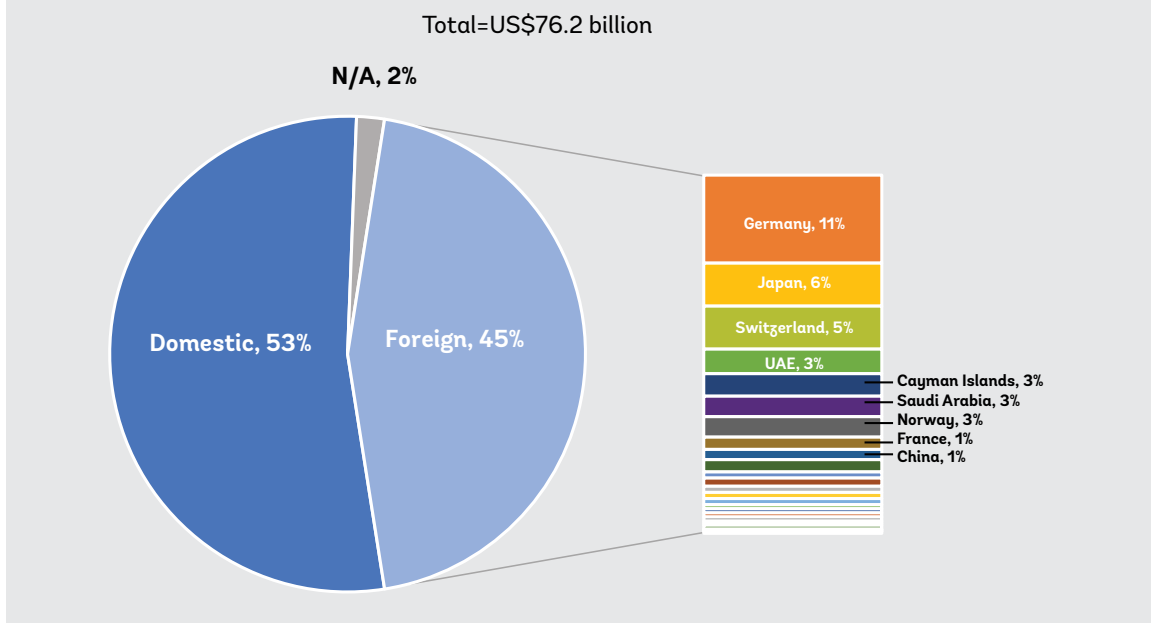
The region with the largest portion of internationally sponsored projects was Sub-Saharan Africa, with 19 projects out of 26 (73 percent). In that region, France (five projects) was the main country of origin. The region with the second largest portion of foreign sponsored projects was ECA with 13 of 35 projects (37 percent). In ECA, United Arab Emirates was the main countries of origin, sponsoring four renewable powers projects.

Out of the total of 240 investments recorded in 2021, 165 (or 69 percent) were domestically sponsored. The high number of domestically sponsored projects were attributed to China. In China, there were 60 projects in 2021, and almost all of them were sponsored by domestic entities. Other countries with a significant number of projects sponsored by domestic entities include Brazil (24 projects) and India (20 projects).

In terms of total investment volume, 45 percent of projects (US\$34 billion) were sponsored by foreign entities (Figure 2).

**FIGURE 2**

Proportion of Foreign to Local Sponsors in Low- and Middle-Income Countries with Private Investment Commitments, 2021



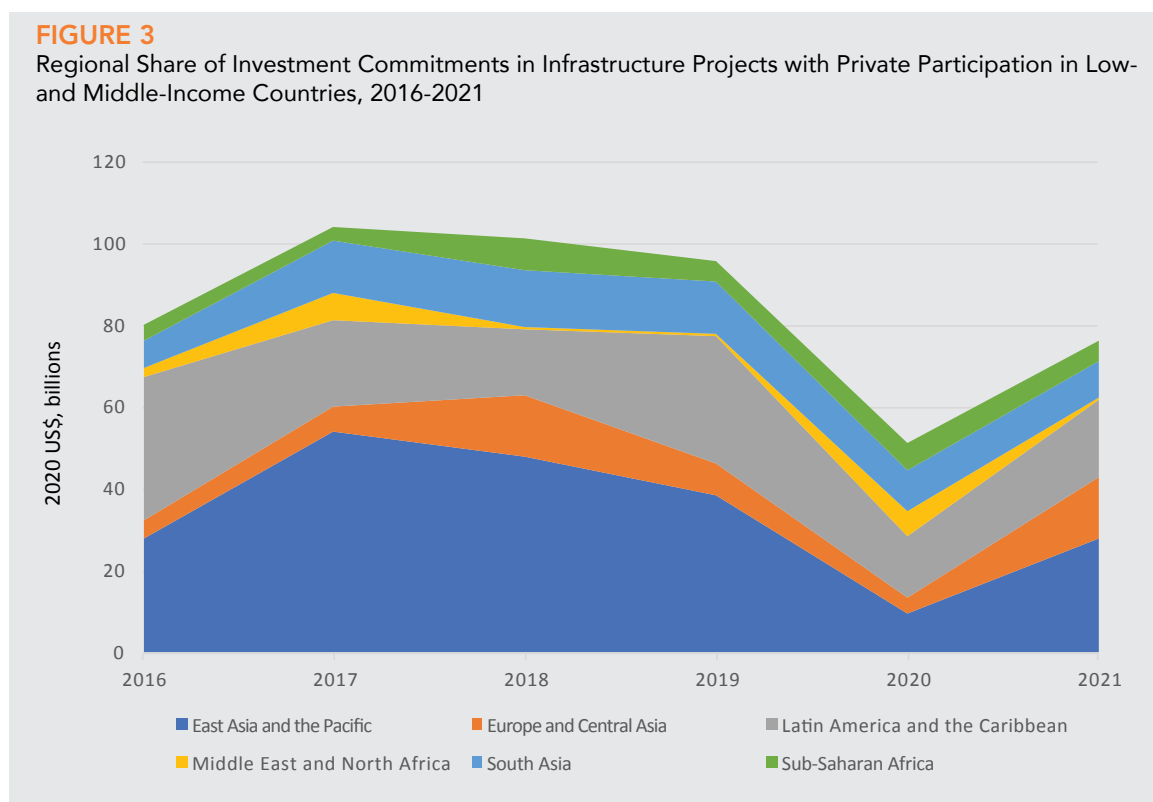
Germany and Japan were the main countries of origin, sponsoring international projects worth US\$8.3 billion and US\$4.3 billion, respectively. A German company won the auction for the new concession to operate an airport in Turkey. Japanese companies have sponsored a LNG power plant and a coal power plant in Vietnam.

## 2. Geographic Spread and Trends

Recovery from the deep recession triggered by the COVID-19 pandemic<sup>6</sup> has been uneven, leaving behind some regions. PPI recovery in 2021 was stronger in three regions: East Asia and the Pacific (EAP), Latin America and the Caribbean (LAC), and Europe and Central Asia (ECA). Private investment commitments in Middle East and North Africa (MENA), and South Asia (SAR) decreased compared to 2020. PPI investments in SSA stayed at about the same level as the previous five years' average (Figure 3).

**FIGURE 3**

Regional Share of Investment Commitments in Infrastructure Projects with Private Participation in Low- and Middle-Income Countries, 2016-2021



As a percentage of regional GDP, Europe and Central Asia had the highest PPI as a share of GDP in 2021 at 0.47 percent, followed by Latin America and the Caribbean at 0.46 percent, Sub-Saharan Africa at 0.31 percent, and South Asia at 0.26 percent. Despite its high absolute value, East Asia and the Pacific represented the second lowest PPI as a share of GDP at 0.16 percent. This is mainly because of sizable GDP in China at US\$14.7 trillion. Excluding China, EAP's PPI is at one percent of its regional GDP. Middle East and North Africa recorded the lowest PPI both in absolute number and in terms of its regional GDP (Table 1).

<sup>6</sup> Investment commitments in infrastructure with private participation in 2020 stood at US\$45.7 billion across 252 projects, marking a 52 percent decline from 2019 levels.

Table 1: Regional PPI as a Share of Regional GDP, 2021				
Country	PPI (US\$, millions)	GDP 2020 (US\$, millions)	PPI/GDP (2021)	PPI/GDP (2016-2020 average)
Europe and Central Asia	15,016	3,222,404	0.47%	0.22%
Latin America and the Caribbean	18,589	4,035,271	0.46%	0.49%
Sub-Saharan Africa	5,202	1,702,343	0.31%	0.30%
South Asia	8,693	3,386,420	0.26%	0.32%
East Asia and the Pacific	28,081	17,448,895	0.16%	0.22%
Middle East and North Africa	626	1,195,746	0.05%	0.24%

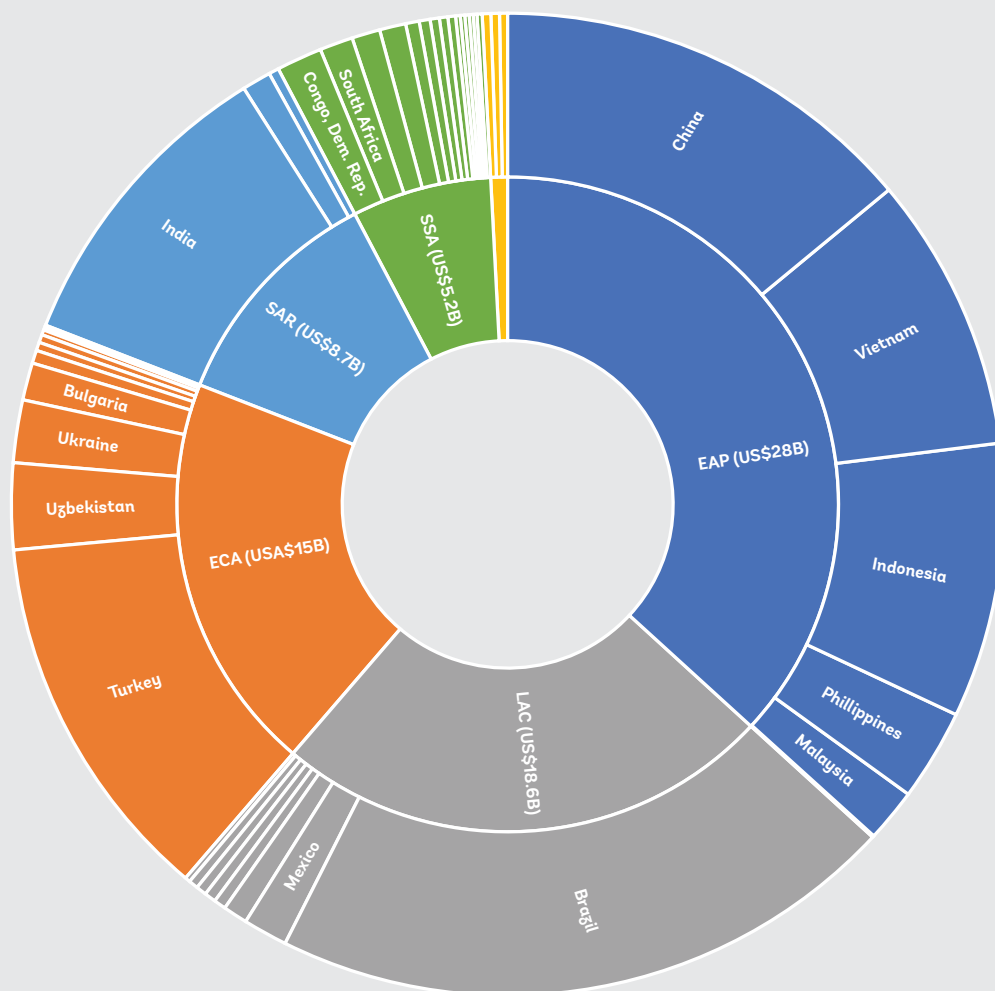
The five countries with the highest levels of investment in 2021 as a percentage of national GDP were: Mozambique with 4.7 percent of its GDP committed to PPI investments; Uzbekistan, with 3.6 percent; Eswatini, with 2.9 percent; Vietnam, with 2.6 percent; and the Democratic Republic of Congo, with 2.3 percent.

In absolute terms, Brazil, China, Turkey, India, and Vietnam received the largest PPI investments in 2021. These five countries together attracted US\$50.3 billion, capturing 66 percent of global PPI investment in 2021 (Figure 4).



**FIGURE 4**

Investment Commitments in Infrastructure Projects with Private Participation In Low and Mid-income Countries, by Region and Country, 2021.



## Europe and Central Asia

Europe and Central Asia (ECA), with US\$15.0 billion of investment commitments, had 0.47 percent of its regional GDP committed to PPI investments. This compares to the past five-year average of 0.22 percent. The region saw a sharp increase from the 2020 level of US\$3.7 billion, as well as from the five-year average of US\$7.4 billion. This was mainly due to significant increases of PPI investments in Turkey and Uzbekistan. However, the PPI outlook in the region will likely be dampened by a sharp rise in policy uncertainty in Turkey, and an escalation in geopolitical tensions around Ukraine.

In 2021, Turkey had US\$9.4 billion worth of PPI investments across three projects, representing 1.3 percent of its GDP. This is its largest level of PPI investment commitments in the past five years. This rebound can be mostly attributed to the US\$8.0 billion airport concession project in Antalya. While PPI investments in the airport sector have fallen considerably over the last couple of years due to COVID, air

traffic started to pick up in the second half of 2021 and this traffic growth is expected to continue in 2022 as COVID-related travel restrictions are gradually rolled back.

Uzbekistan has continued to attract PPI for three consecutive years. Uzbekistan received US\$2.2 billion of PPI investment commitments in 2021 across five projects, marking 3.6 percent of its national GDP. All of its PPI investments were in the energy sector. It is expected that the strong PPI performance in the country will likely continue because Uzbekistan has implemented an ambitious public-private partnership program that included passing a public-private partnership (PPP) law, creating a dedicated PPP agency, and requiring line agencies to actively promote PPPs for key projects.

Other countries with PPI investment commitments in ECA included Albania (US\$124 million), Armenia (US\$53 million), Azerbaijan (US\$200 million), Bulgaria (US\$936 million), Kazakhstan (US\$327 million), North Macedonia (US\$75 million), Russia (US\$210 million), and Ukraine (US\$1,571 million).

## **Latin America and the Caribbean**

With US\$18.6 billion across 56 projects in 2021, LAC received the second largest investment commitment of all regions. This represents 0.46 percent of regional GDP. Private investment commitments in LAC increased by 22 percent from 2020, but decreased by 21 percent in comparison to the previous five-year average. In the first half-year of 2021, LAC received US\$13.9 billion of PPI investment commitments, surpassing its 2020 full-year investment levels, but it ended up adding only US\$4.7 billion in the latter half of 2021.

Brazil represented 84 percent of LAC's 2021 investments. The country received US\$15.7 billion of private investment commitments across 36 projects, representing 1.1 percent of its 2020 GDP. Most of its PPI investments were channeled to the transport (US\$6.9 billion) and water sector (US\$5.6 billion). In the second half of 2021, Brazil's National Land Transport Agency (ANTT) signed the concession contract for a road project with the concessionaire Ecovias do Araguaia. A total of US\$2.54 billion is expected to be spent for improvements in road safety and other user services. The country is likely to continue this upward trend into 2022 as it is planning to hold 126 auctions of private including ports, airports, and national parks sanitation projects.

Mexico received US\$1.1 billion in PPI investment commitments across six projects in 2021, accounting for 0.1 percent of its national GDP. It was the lowest amount of PPI investments recorded in Mexico over the last 10 years. Unlike previous years, in which the major PPI sector was the renewable power sector, most of its PPI transactions in 2021 were in transport.

Other countries with PPI investment commitments in LAC included Colombia (US\$610 million), the Dominican Republic (US\$235 million), Ecuador (US\$260 million), Paraguay (US\$130 million), and Peru (US\$300 million).

## **East Asia and the Pacific**

In 2021, EAP received a total of US\$28.1 billion in investments across 89 projects. This was a 196 percent increase from investment levels after a particularly low year in 2020. However, the region did not experience anything like a full return to normality, because investment levels fell 21 percent short of the previous five-year average of US\$35.5 billion. Notably, although investment levels almost doubled from 2020 to 2021, the number of projects in the region remained the same.

As in previous years, China retained its position as EAP's largest PPI investment destination attracting US\$10.6 billion across 60 projects, marking a 69 percent increase from 2020 levels. However, this was still down from its five-year average of US\$20 billion, reflecting the lingering impact of the localized outbreaks of the COVID-19 Delta variant and recurrent mobility restrictions that hampered recovery. In 2021, China's national banks provided short-term liquidity injections and cut reserve requirements, and the government accelerated infrastructure investments in order to spur recovery and growth. More than 60 percent of its 2021 PPI investment commitments were channeled to the transport sector, especially greenfield road and railway investments. The sector that recorded the second highest PPI investment levels was water and sewerage, which predominantly registered greenfield treatment plant investments.

The significant increase in EAP's investment levels can be attributed to Indonesia and Vietnam, each of which received US\$6.9 billion. In terms of both investment commitments and number of projects, this was Vietnam's highest in the last five years. 2021 PPI investments in Vietnam equated to 2.6 percent of its GDP, placing it as the fourth largest PPI recipient in terms of GDP. The strong pace will likely continue in the next few years, supported by Vietnam's first-ever law on public private partnerships, which came into effect in early 2021. This law demonstrated the government's commitment to attracting high-quality PPP projects and is expected to contribute to the long-term effectiveness and stability of future PPP project implementations.

For Indonesia, there was a sizable increase in 2021 to US\$6.9 billion across five projects, after hitting record low investment commitments in both 2019 and 2020, during which the country did not report any PPI investment transactions for the first time in its PPI history. The largest PPI sector in Indonesia was energy. In 2021, Indonesia reported Southeast Asia's biggest floating photovoltaic (PV) installation project as part of its strategy to expand floating PV installations as it targets generating 23 percent of its power with renewables by 2025.

Other countries with PPI investment commitments in EAP included Cambodia (US\$41 million), Malaysia (US\$1,331 million) and the Philippines (US\$2,289 million). Thailand, a usual regional PPI destination, did not report any PPI investment transactions for 2021.

## **Sub-Saharan Africa**

SSA attracted US\$5.2 billion in investments across 26 projects in 2021, representing 0.3 percent of its regional GDP. This marked a 17.1 percent decrease in investment levels from 2020 and a 3 percent decrease from the five-year average. This was mainly because of recurrent virus flare-ups in the region and low vaccination rates, which dampened its recovery. Despite the decrease, a larger number of SSA countries recorded PPI transactions, with Botswana, Ethiopia and Eswatini recording their first PPI transactions since 2011, 2014, and 1998, respectively. In 2021, 19 SSA countries reported PPI projects. This compares to 16 countries in 2020 and a past five-year average of 14 countries.

The leading PPI investment destination in SSA for 2021 was the Democratic Republic of Congo, which received US\$1.1 billion in investments across three projects. This accounts for 2.3 percent of its GDP. However, the vast majority of the country's investment was for the Port of Banana concession, which received US\$1.0 billion. The past two years have been very positive from a PPI perspective for the Democratic Republic of Congo, which last reported PPI projects more than 20 years ago.

Mozambique received US\$652 million in PPI investments for one power project, the Temane Gas-Fired Plant. This project alone placed Mozambique as the largest PPI recipient in 2021 in terms of national GDP at 4.7 percent. DEFIIs played an important role in this project as the debt financing was provided by International Finance Corporation (IFC), along with the FMO, Emerging Africa Infrastructure Fund, US International Development Finance Corporation (DFC) and the OPEC Fund for International Development. The Multilateral Investment Guarantee Agency (MIGA) provided political risk insurance to the private sector equity investors. Mozambique has now received PPI investment commitments for three consecutive years since 2019.

Other countries in SSA with PPI transactions in 2021 included Angola (US\$190 million), Burkina Faso (US\$112 million), Chad (US\$71 million), Côte d'Ivoire (US\$701 million), Gabon (US\$209 million), Ghana, Kenya (US\$98 million), Madagascar, Malawi, Mali (US\$56 million), Nigeria (US\$108 million), Uganda (US\$230 million), South Africa (US\$826 million) and Zambia (US\$336 million).

## South Asia

Following the major setback to health and economic activity caused by the mid-2021 second wave of COVID-19 in South Asia, PPI investments in SAR declined further to US\$8.7 billion from the region's 2020 investment amount of US\$10.1 billion. However, the economic impacts caused by the second wave in the first half of 2021 were to some extent alleviated in the second half of the year with SAR adding US\$6.2 billion of PPI investments, most of which occurred in India.

With US\$7.7 billion in commitments across 25 projects, India was SAR's largest PPI investment destination. Whereas most SAR countries saw a sharp drop in PPI compared to 2020, India saw a 49 percent increase in private investment commitments. Transport, especially the airport sector, has been the main driver for PPI investment recovery in many countries and India was not an exception. India closed a US\$4.0 billion airport concession deal in 2021. In the first phase of the project, the airport will have a handling capacity of 12 million passengers per annum and once all four phases of the project are complete, the total capacity is projected to be 70 million passengers per annum. While the aviation industry in India has grown steadily compared with other sectors, India received only US\$100 million in PPI investments in the sector in 2020 due to the ongoing impact of the pandemic. However, India is expected to have large amounts of PPI investment levels across all sectors in the coming few years, following the launch of the National Infrastructure Pipeline (NIP) as part of its commitment to improving infrastructure over the next five years. The NIP targets the private sector as being the sole player in the implementation of renewable energy projects, while also playing a substantial role in the provision of digital and transport infrastructure.<sup>7</sup>

Other SAR countries with PPI transactions were Sri Lanka (US\$720 million), Pakistan (US\$250 million), and Bangladesh. Pakistan featured in the top five countries for investment commitments in 2020, but its investment levels then fell in the first half-year of 2021 to US\$250 million and it did not close any project in the second half of 2021. Several of these nations face severe debt challenges which have been exacerbated as a result of the pandemic, which hinders PPI investments. Sri Lanka is the most vulnerable

<sup>7</sup> Make in India. National Infrastructure Pipeline—Building India. <https://www.makeinindia.com/national-infrastructure-pipeline-building-india>.

of the countries in SAR with the country's one-year default rate in 2021 being 28 percent, the highest in Asia.<sup>8</sup>

## **Middle East and North Africa**

MENA's 2021 PPI investments of US\$626 million decreased by 90 percent from the region's 2020 level of US\$6.2 billion. Investments were also 81 percent down from the region's past five-year average of US\$3.3 billion. 2021 PPI investments in MENA accounted for 0.05 percent of region's national GDPs.

In the latter half of 2021, IFC arranged a financing package to help fund a new terminal at Iraq's largest port. Morocco has now sustained investments for five consecutive years thanks to a port container project.

Besides Morocco and Iraq, Egypt is the only other country with PPI investments in the region.

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<sup>8</sup> Ondaatjie, Anusha, and Lilian Karunungan. 2021. "Asia's Highest Default Risk Spotlights Sri Lanka Debt Worry." Bloomberg, July 5, 2021. <https://www.bloomberg.com/news/articles/2021-07-05/asia-s-highest-default-risk-spotlights-sri-lanka-debt-concerns>.

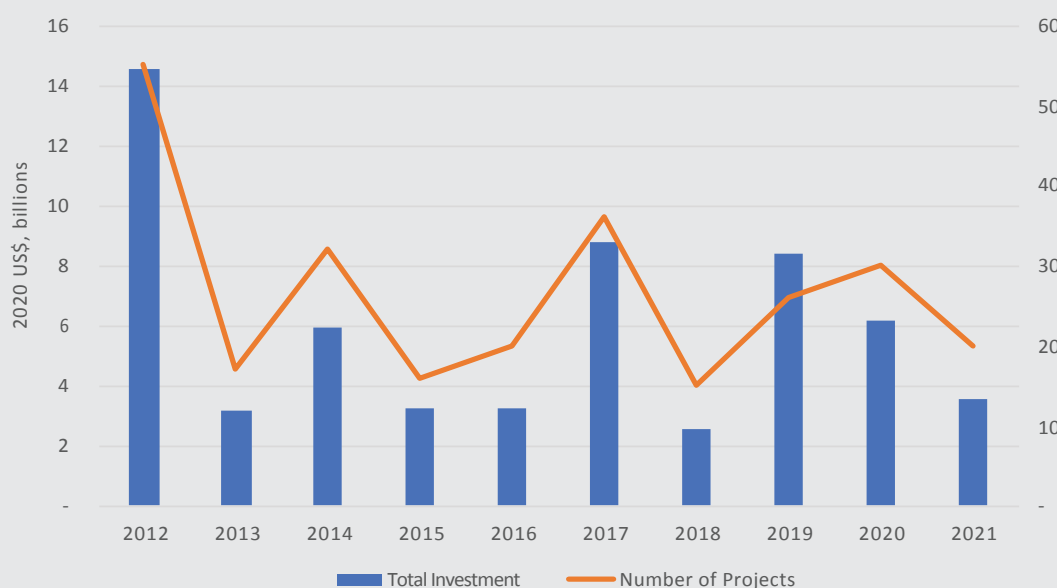


### 3. Investment in International Development Association (IDA) Countries

Fourteen IDA countries received investment commitments amounting to US\$3.6 billion across 20 projects in 2021, which was 8 percent of the total number of PPI projects globally for the year. This represented a 41.5 percent decrease in investment levels compared to 2020, and a 38 percent lower investment level than the past five-year average of US\$5.8 billion. Additionally, the number of projects was slightly lower than the five-year average of 25 projects across 15 countries. As a percentage of global PPI investments, IDA countries' share decreased from 12 percent in 2020 to 4.7 percent in 2021. This was less than the five-year average share of 7.2 percent.

**FIGURE 5**

Investment Commitments in Infrastructure Projects with Private Participation in IDA Countries, 2012–2021



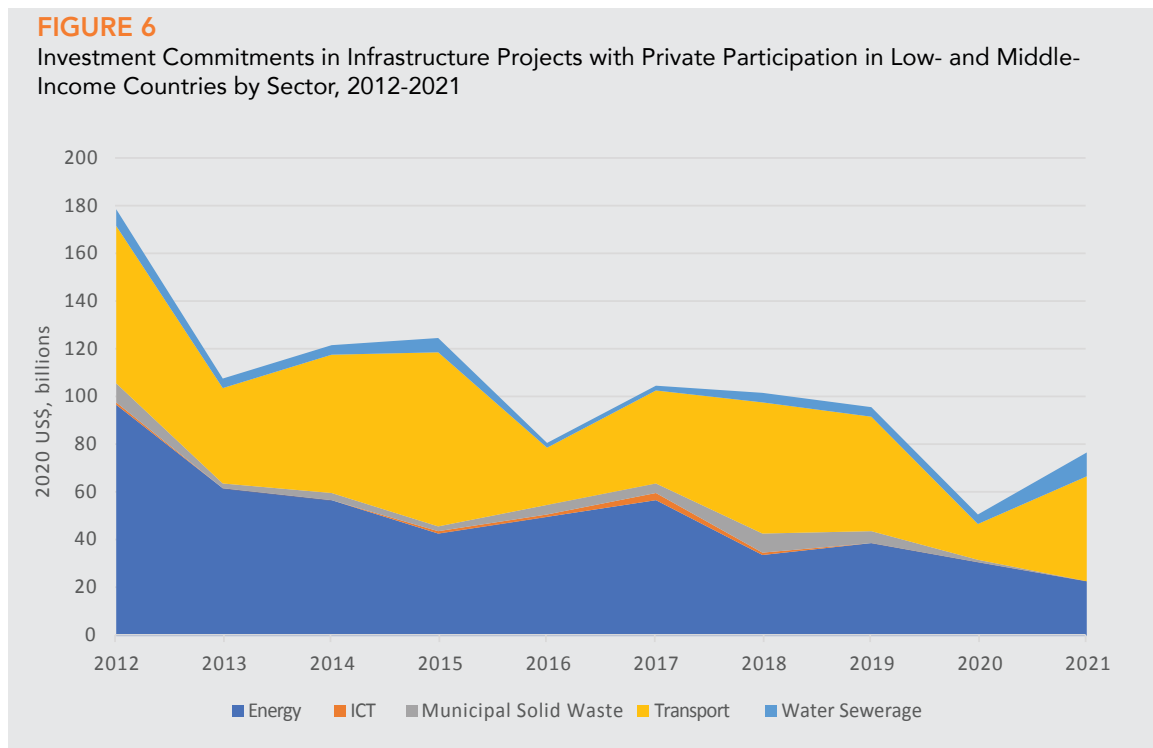
Investments in IDA countries were led by substantial commitments in the Democratic Republic of Congo (DRC), which received US\$1.1 billion in investments across three projects. The past two years have been very positive from a PPI perspective for the Democratic Republic of Congo, which last reported PPI projects more than 20 years ago. Côte d'Ivoire attracted US\$701 million in PPI transactions across two projects. Combined, these five projects alone accounted for more than 50 percent of investment commitments in IDA countries. In addition, all five projects were concentrated in the transport and energy sectors. In particular, the biggest project was a US\$1 billion greenfield port project in the Democratic Republic of Congo (DRC), the first deep-sea port in the country. This port development project should help the DRC achieve improved access and greater connectivity to global markets.

Ethiopia recorded its first PPI transaction in the database since 2014, a US\$271 million geothermal power plant in Oromia which forms part of the government's plan to increase geothermal generation by up to 18 percent of the country's energy mix by 2024. Although Ethiopia launched its public-private partnership policy and procurement framework in 2017 to promote infrastructure development, numerous challenges have remained since then, not least in terms of governance, capacity gaps, and substantial risks to investment. The milestone of reaching financial closure for the Tulu Moye Geothermal Power Plant should hopefully demonstrate credible progress, and serve as an impetus for the successful implementation of other PPI projects in the pipeline.

Other IDA countries with PPI transactions in 2021 included Bangladesh, Burkina Faso, Cambodia, Chad, Ghana, Madagascar, Malawi, Mali, Mozambique, Uganda and Zambia. Notably, Bangladesh has managed to sustain PPI investment commitments every year since 2005. Also, it is worth noting that 12 of 20 projects had some type of DEFI support, reaffirming the importance of such support in IDA countries.

## 4. Sector Trends

The transport sector led the recovery in 2021, outpacing the energy sector with US\$43.8 billion investments across 82 projects. This marks a return to the historic trend for PPI in the last decade, following 2020 when the pandemic brought investments in the transport infrastructure to a near standstill. The energy sector, which led PPI investments in 2020, dropped to US\$22.4 billion across 102 projects, a 26 percent decrease by investment value. The water and sewerage sector had investment commitments of US\$9.9 billion across 44 projects. This investment commitment was a 146 percent increase from 2020. Municipal solid waste amounted to US\$161 million across 12 projects, marking an 84 percent decrease from 2020 investment levels.



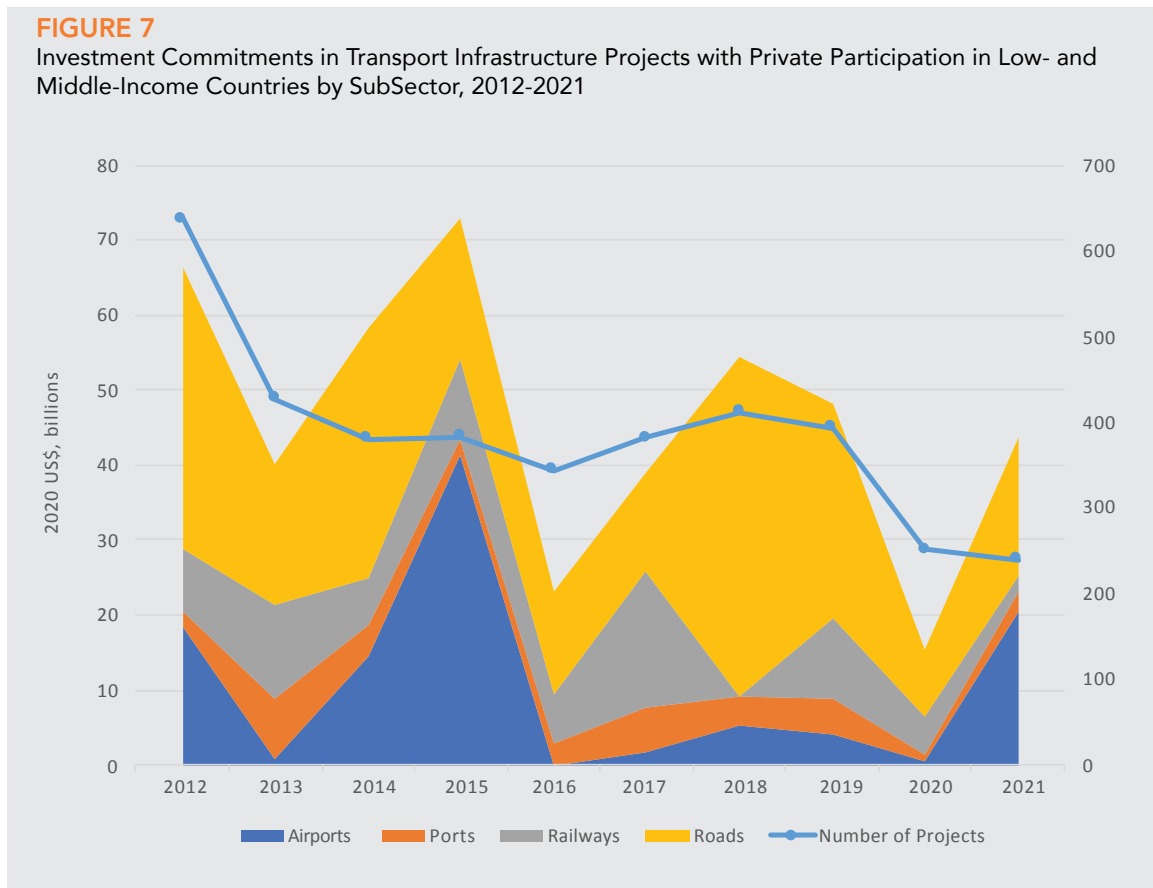
### Transport

PPI investments in transport nearly bounced back to pre-pandemic levels accounting for 58 percent of total investment commitments in 2021. At US\$43.8 billion across 82 projects, investment commitments were 91 percent of the transport investment commitments in 2019. This marks a significant rebound from a severe drop in investment levels in 2020, during which the transport sector was severely impacted by drastic declines in international travel, worldwide lockdown measures, and supply chain disruptions.

Despite the ongoing pandemic and emergence of new variants, PPI in transport bounced back sharply with increases across every region except for MENA. ECA and EAP led the transport sector with a five-fold increase in investment levels (5.4 times and 4.9 times, respectively). This was followed by LAC, which

grew at 2.7 times and SAR at 1.4 times the investment levels compared to 2020. The increase in SAR is particularly interesting because SAR's overall investment commitments have still not fully recovered to pre-COVID levels as the region has suffered extensively through various lockdowns and the drastic impact of the Delta variant, notably in India in the first half of 2021. SSA witnessed increased investment levels by 93 percent with the financial closure of six projects at US\$1.9 billion. This increase was largely due to the financial closure of the port of Banana megaproject in the Democratic Republic of Congo which posted investment commitments of US\$1 billion.

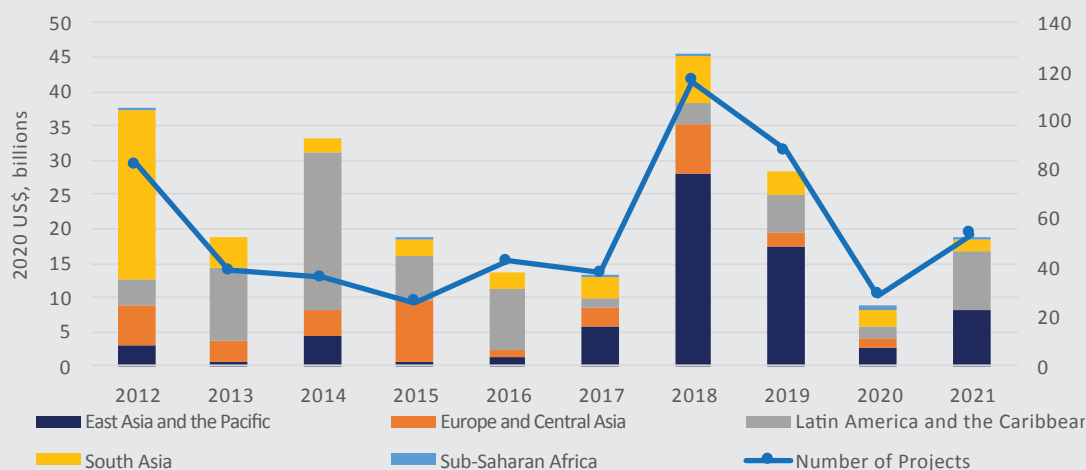
Whereas MENA saw a substantial decrease in investment levels in the transport sector compared to 2020, 2021 commitments are still higher than pre-pandemic transport commitments in the region. The 2020 spike was due to the financial closure of the Cairo Monorail system.



Investments in roads—historically the largest subsector in transport commitments—doubled in value from 2020, with US\$18.7 billion across 54 projects, but were outpaced by the airport subsector for the first time since 2015. LAC and EAP led in road investment commitments in 2021, whereas South Asia dropped significantly. However, investment levels in South Asia, specifically in road infrastructure, is expected to pick up after India announced that its national highway network will be expanded by 25,000 kilometers through PPPs over the next fiscal year.

**FIGURE 8**

Investment Commitments in Road Infrastructure Projects with Private Participation in Low- and Middle-Income Countries by Region, 2012-2021

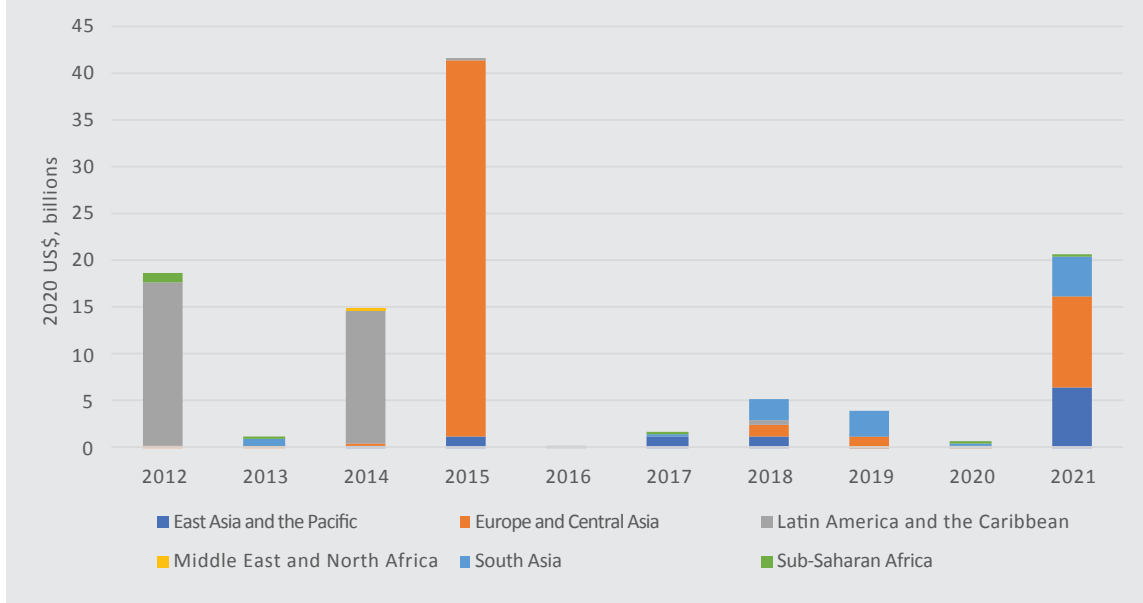


Investment commitments in airports amounted to US\$20.3 billion across 15 projects. This is a 39-fold increase from 2020 and a four-fold increase from pre-pandemic levels (2019) and only just behind the peak investment commitment level achieved in 2015. This accounted for 46.3 percent of all transport PPI investments. ECA and EAP led the region in airports investment commitments (US\$9.6 billion and US\$6.5 billion, respectively) followed by South Asia (US\$4 Billion). Airport PPPs saw a drastic decline in 2020 following the decrease of international travel, and several projects that were in the pipeline were delayed. However, traffic started rebounding in the second half of 2021 and given the likely fiscal constraints arising from COVID, it is likely that many governments will increasingly look to the private sector to lead investments in the airport sector moving forward.



**FIGURE 9**

Investment Commitments in the Airports Subsector by Region, 2012-2021



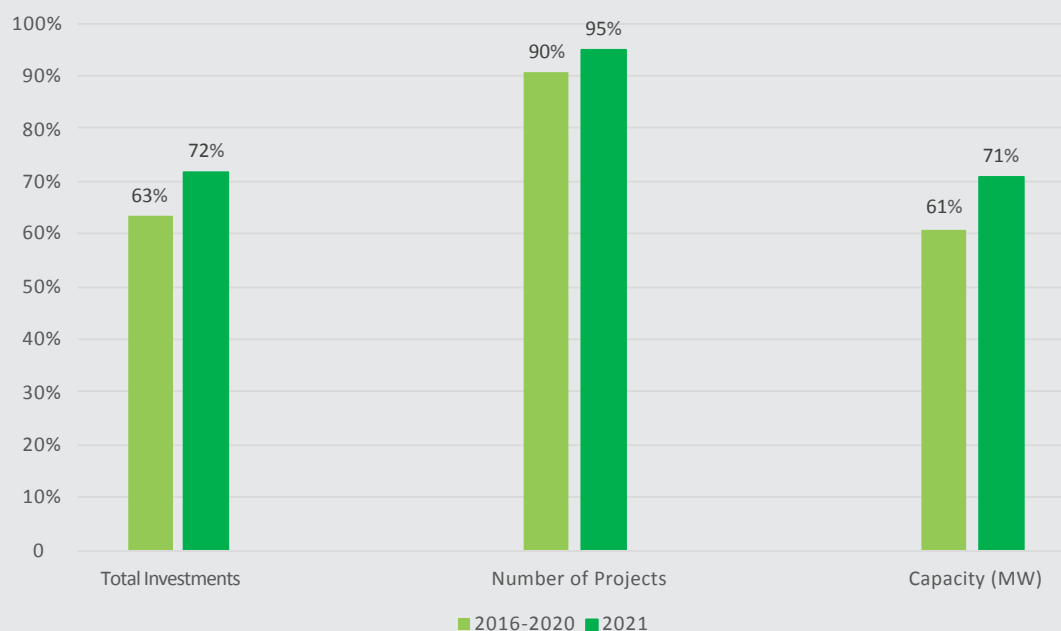
The railways subsector saw a decrease in investment from 2020 with commitments of US\$1.8 billion across four projects, while port investments bounced back 2.7-fold to US\$2.9 billion across nine projects.

## Energy

At US\$22.4 billion across 102 projects, the energy sector accounted for 29 percent of all PPI investments in 2021. This was a 26 percent decrease from investment levels in 2020, when energy accounted for 59 percent of PPI investments. EAP and ECA saw substantial recovery in energy investments with an increase of 92 percent and 278 percent respectively. However, the other four regions (LAC, SAR, MENA, and SSA) saw decreases, with the most severe fall seen in MENA at 86 percent, followed by South Asia at 75 percent.

**FIGURE 10**

Electricity Generation Projects in Low- and Middle-Income Countries (Renewable and Conventional Resources) by PPI Investment Volume, Number of Projects, New Capacity, Five-Year Average (2016-2020) and 2021



## Electricity

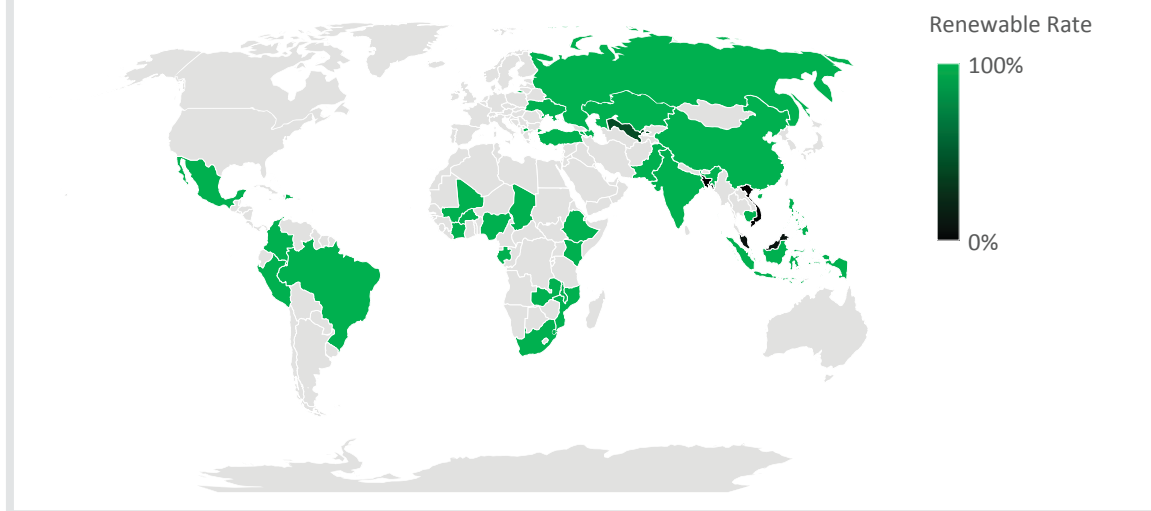
In 2021, all energy projects were in the electricity subsector. Ninety-eight percent of energy projects were electricity generation, with only three distribution and transmission projects. This was higher compared to 90 percent by investment value in 2020. Despite the pandemic, the shift towards renewable energy continues—94 projects were renewable in 2021, compared to only five conventional projects.

## Electricity Generation

Ninety-five percent of electricity generation projects were renewable in 2021 compared to 91 percent in 2020. This is equivalent to 72 percent by total investment, up from 63 percent for the previous five-year average (2016-2020). By added capacity, 71 percent of new energy generation projects in 2021 were renewable compared to an average of 61 percent over the last five years.

**FIGURE 11**

Figure 11: Rate of Renewable Energy Sources Used in Newly Added PPI Electricity Generation



At a country level, most countries had a renewable energy investment rate of 100 percent, with the exception of Bangladesh, Malaysia, Uzbekistan, and Vietnam, which had higher investments in conventional projects than renewable. Compared to 2020 with 29 countries with a complete renewable rate (100 percent) 2021 saw 33 countries with a complete renewable rate.

Solar accounted for 45 percent of energy projects by investment value compared to 22 percent on average over the past five years. This continues the trend in 2020 of favoring solar projects, especially in India and Brazil, which led the number of projects using photovoltaic technology. This was followed by wind at 22 percent, compared to a slight increase from the five year average of 21 per cent. In 2021, the PPI database also included an offshore wind investments with the financial closure of the Lien Lap Phong Huy and Phong Nguyen offshore wind projects. Both solar and wind have seen their levelized cost of electricity (LCOE) continue to fall throughout the pandemic. This is largely due to the fact that wind and solar technology have no fuel costs and relatively small variable costs. This LCOE decrease is expected to continue until 2030, driven by improvements in technology, competitive procurement, and increased developer and operational experience as well as maturing energy markets.

The share of hydro projects has decreased substantially to US\$ 309 million, largely due to the large initial investments required for project launch and environmental considerations. Compared to the past five-year average (21 percent), only 11 percent of energy projects were coal powered in 2021. There were no diesel projects in 2021 and the share of investment commitments in natural gas has remained the same at US\$3.8 billion. Across all regions, renewable technology uptake is on the rise, displacing conventional projects.

## Water and Sewerage

Investment commitments in the water supply and sanitation sector (WSS) grew to US\$9.9 billion across 44 projects, a 146 percent increase compared to 2020. This was a marked increase from pre-pandemic

levels as well. Water utility projects accounted for 61 percent of total WSS investments, whereas water treatment accounted for 39 percent. Investment commitments in WSS were made in China, Brazil, Botswana, Egypt, Ghana, India, the Philippines, and Sri Lanka.

Typically characterized by smaller projects by investment value, the year 2021 saw the financial closures of three mega WSS projects in Brazil. These were the privatizations of Rio de Janeiro Blocs 1 (US\$2 billion), 2 and 4 (US\$1.8 billion each) projects. The privatization comes after many years of deliberations and effort to provide greater quality of water. Only 65 percent of sewage in the Brazilian capital is properly treated, leaving 35 percent to be improperly discharged.

## **Municipal Solid Waste**

Investment commitments in municipal solid waste (MSW) saw a decrease of 84 percent from 2020, with investments totaling US\$161 million across 12 projects. This was substantially lower than pre-pandemic levels, with MSW investment levels in 2021 accounting for only 4 percent of MSW investment commitments in 2019.

The majority of projects were in Bulgaria, with an average investment size of US\$4.6 million. The largest MSW project to achieve financial closure, however, was the Shihezi Integrated Waste Treatment Project in China, with investment commitments of US\$73 million.

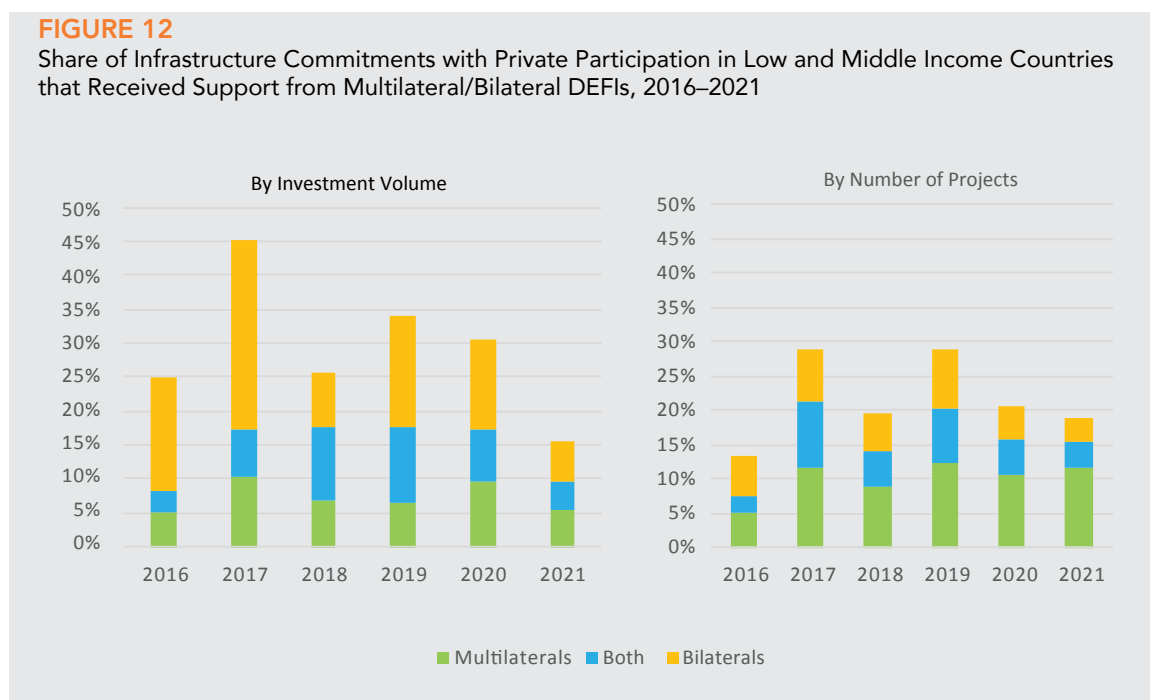
## 5. Financing Trends

### Development and Export Finance Institution (DEFI) Support<sup>9</sup>

In 2021, 45 projects totaling US\$11.8 billion of investment received one or more forms of typical DEFI support, being either direct or syndicated loans, equity, grants, guarantees or advisory services or technical assistance. The 45 projects accounted for 19 percent of all PPI projects by number, similar to the numbers seen in 2018 (Figure 12). By investment value, however, projects with DEFI support accounted for 16 percent of total investment commitments, a decline from the previous five year average of 32 percent. The average size of projects receiving investment support fell as well, from nearly US\$300 million on average in 2020, to US\$262 million in 2021.

**FIGURE 12**

Share of Infrastructure Commitments with Private Participation in Low and Middle Income Countries that Received Support from Multilateral/Bilateral DEFI, 2016–2021



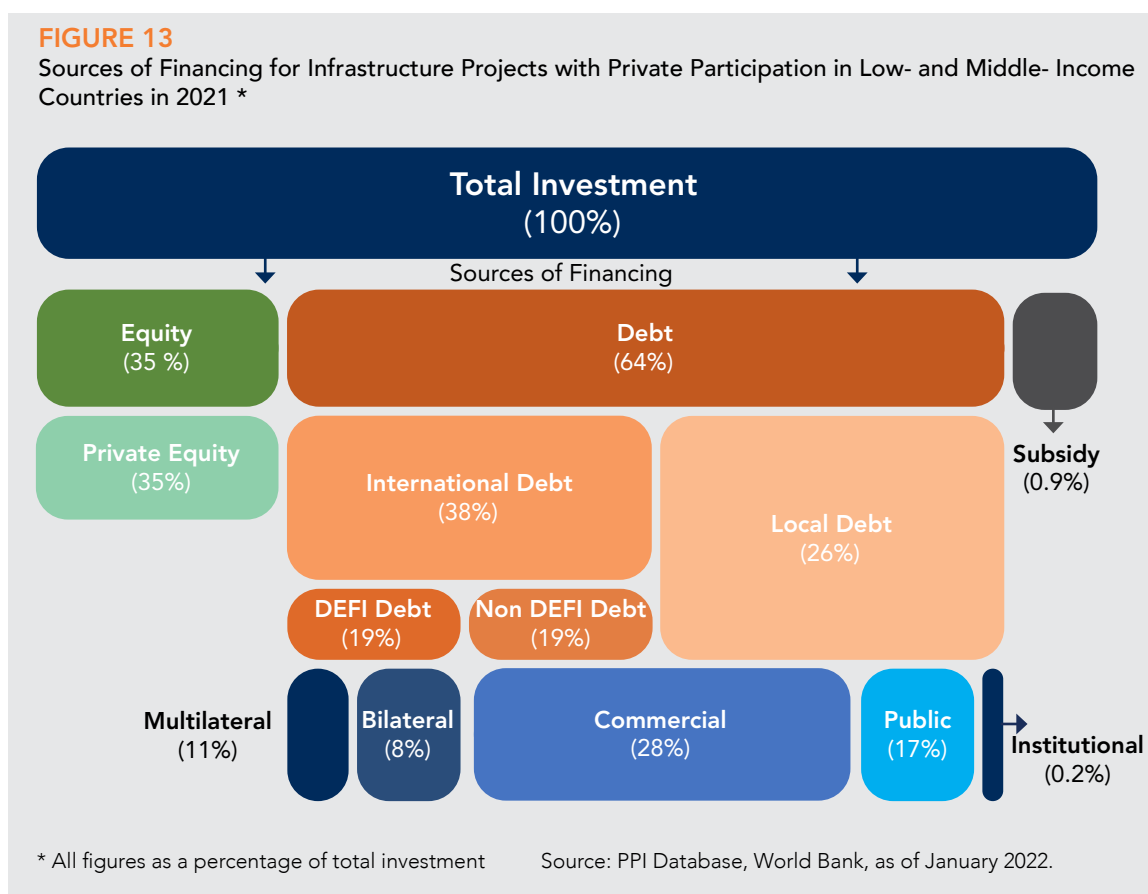
Like in previous years, DEFI support tends to be focused on the energy sector, representing 78 percent of the total number of projects receiving support. Support tends to be directed toward renewable energy projects, with 32 out of 35 energy projects in this sector, in line with the global push to reduce greenhouse gas emissions and combat climate change. Strong emphasis was again seen in the solar sector, with 22 solar projects, with the remaining projects being in wind energy (six projects), biomass (one project), geothermal (one project), hydro (one project), and waste (one project). Low-income and lower-middle-income countries continued to see higher levels of DEFI support (28 projects), compared to upper-middle-income countries (17 projects), indicating the importance of the role played by DEFIs in stimulating growth and investment in low income and lower middle-income countries.

<sup>9</sup> DEFI, for the purposes of this report, refers to multilateral institutions and bilateral agencies with a development mandate, as well as export credit agencies with a mandate to support domestic businesses in pursuing investments abroad. Henceforth in this report, the term bilaterals will include bilateral institutions as well as export credit agencies.



DEFI provided direct debt support of US\$4.3 billion in 2021; of this, 39 percent, or US\$1.7 billion in direct loans, was provided by bilateral institutions to 17 projects. Multilateral institutions provided US\$2.6 billion in direct loans to 32 projects, as well as equity, syndication, and advisory services to five projects. International Finance Corporation (IFC), the African Development Bank (AfDB), and the European Bank for Reconstruction and Development (EBRD) provided a bit more than half of the multilateral support (51 percent), with a total of US\$1.3 billion in loans. IFC alone accounted for US\$640 million in loans, sponsoring a quarter of the multilateral loans. There were three guarantees<sup>10</sup> given to projects by MIGA in 2021.

## Financing Mix



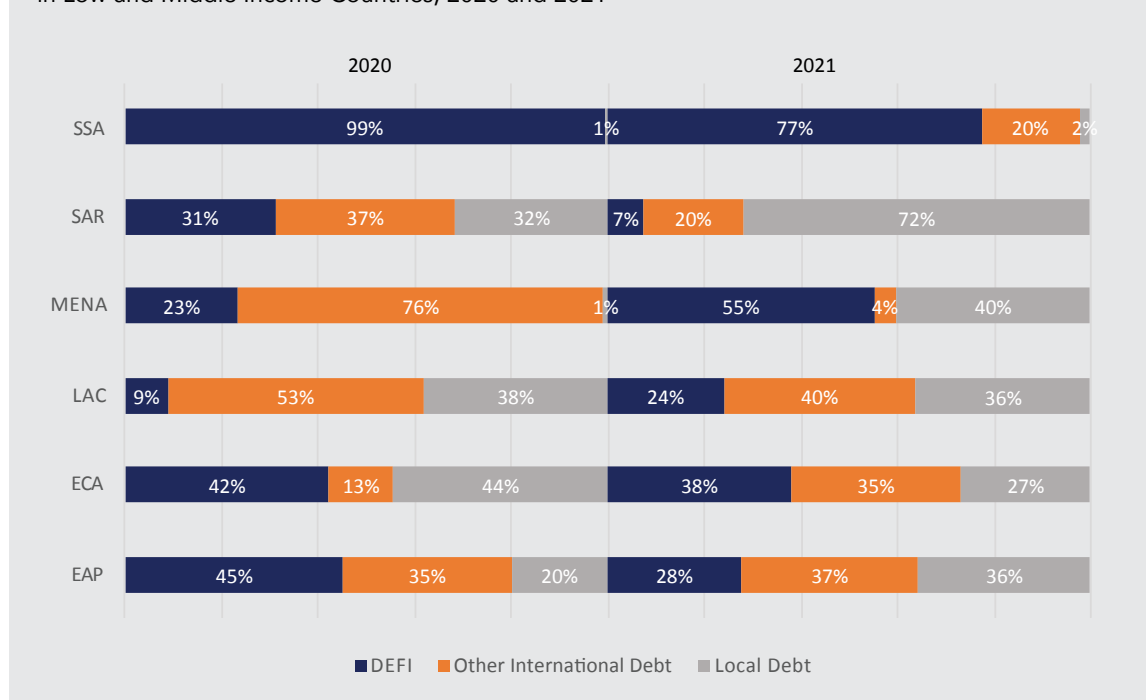
In 2021, detailed financing information was available for 47 percent of projects (85 projects), amounting to 33 percent of PPI projects by investment value (US\$21.3 billion out of US\$65.6 billion). All information in this section is based on these projects, for which investments went solely towards building physical assets. Financing information was not available for China's 60 projects.

<sup>10</sup> At this stage, the PPI Database only indicates projects received guarantees from which entities and not any details on the guarantees covered or the guarantee amounts. Hence, for the projects receiving guarantee support, the debt to such projects is categorized according to the debt provider classification.

Of the US\$21.3 billion in financing mentioned above, approximately 18 percent (US\$3.8 billion) came from public sources, 63 percent (US\$13.5 billion) came from private sources, and 19 percent (US\$4.0 billion) came from DEFI sources. Despite the impact of COVID-19, the share of financing across public, private, and DEFI sources largely remained the same as that of pre-pandemic distribution. Figure 13 provides a detailed breakdown of the investment sources.

**FIGURE 14**

Share of International and Local Debt by Region for Infrastructure Projects with Private Participation in Low and Middle Income Countries, 2020 and 2021



Equity-wise, of the US\$7.5 billion in total equity provided in 2021, all financing came from private sources. Direct government support continued to be low, at 0.9 percent of total investment, or US\$195 million, and this was mainly realized in two SAR projects, a highway project in India and a water treatment plant in Sri Lanka.

Infrastructure projects continued to be highly reliant on debt in 2021, with total debt raised of US\$13.6 billion, or 64% of projects with full financing information available. This is similar to the pre-Covid-19 levels of debt to equity ratio. International debt providers supplied nearly 60 percent of this in 2021 and 38 percent of total investment. In particular, SSA, ECA, MENA, LAC, and EAP saw high levels of international debt. As in the previous years, MENA and SSA were largely reliant on DEFI investment given the relatively underdeveloped financial sectors in these regions. SSA did see an increase in international commercial debt, with two projects in the region—a port project in Côte d'Ivoire and a solar project in Burkina Faso—receiving loans from commercial partners. MENA saw an increase in local commercial debt, case in point being a Moroccan port project which received US\$161 million from local banks. (Figure 14)

ECA saw an increase in international commercial debt as well, due to three renewable energy projects in North Macedonia, Uzbekistan, and Turkey that had investment from international commercial partners. EAP's local debt component increased because projects in South East Asia saw an increase in participation from local partners. The levels of local debt in MENA and EAP at 40 percent and 36 percent respectively rose compared to pre-pandemic levels of 37 percent in EAP and 6 percent in MENA in 2019. LAC's international debt came mostly from commercial sources as well. SAR saw a large increase in the share of local debt. This was mainly due to the Noida airport project that had all its debt (US\$2.6 billion) coming from the State Bank of India.

Interestingly, it seems that commercial, multilateral, and public debt providers were more inclined to provide loans to renewable energy generation projects in 2021. Of the commercial debt given to energy projects, 61 percent (US\$3.0 billion) was lent to renewable energy projects, with solar energy projects accounting for 87 percent of this (US\$2.6 billion). Multilateral lenders also preferred renewable energy projects with 74 percent of debt (US\$1.2 billion) in this sector, again with an emphasis on solar power, which made up 73 percent of this debt. All public lending in energy generation was focused on renewable energy, and it was split between solar and wind energy. Whereas bilateral lenders lent to more renewable energy projects than conventional energy projects (10 projects and two projects, respectively), the coal energy mega project in Vietnam saw a large bilateral debt of US\$862 million, which increased the share of conventional energy projects disproportionately.

Although there is still room for recovery to pre-pandemic levels, the share of commercial debt made a rebound in 2021 from the previous year, and accounted for 28 percent of total investment,<sup>11</sup> compared to 21 percent in 2020. EAP's and ECA's debt were mainly from commercial sources, at 65 percent and 62 percent, respectively. Overall, EAP had the highest levels of commercial debt at US\$2.4 billion, followed by ECA at US\$1.2 billion and SAR at US\$1.0 billion. Malaysia and Vietnam raised over US\$1.1 billion in commercial debt, and Colombia, Malaysia, Morocco, Russia, and Turkey raised all their debt from commercial sources. This slight increase can be attributed to increasing confidence around the long-term recovery from the pandemic and greater confidence in policy responses. Nevertheless, commercial debt shares have not returned to pre-pandemic levels during which almost half of all debt was funded through commercial lenders.

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11 Commercial debt is only the debt raised from commercial banks and not necessarily all debt raised on commercial terms. Multilateral and bilateral agencies, such as International Finance Corporation (IFC) and the Asian Development Bank, and export credit agencies or state-owned banks lending overseas, may also in some cases extend debt on commercial terms, but they are classified here as multilaterals, bilaterals, or public, reflecting their government ownership (and development mandate in the case of multilaterals and bilaterals).

## 6. Conclusion

With a 49 percent increase from the previous year, the PPI investment commitments in 2021 totaled US\$76.2 billion, displaying clear signs of recovery. As traffic started rebounding in the second half of 2021, PPI investments in transport nearly bounced back to pre-pandemic levels. Also, the energy sector was greener even though the sector's investment commitments fell.

However, it is early to determine the upward post-pandemic PPI trend because the investment commitments were still 12 percent lower than the previous five-year average. Further, recovery from the recession has been uneven, leaving some regions such as South Asia, MENA, and Sub-Saharan Africa behind. Finally, PPI investments in IDA countries were lower than their past five-year average.

There are more daunting challenges lying ahead, particularly for developing countries. An escalation in geopolitical tensions, especially, in Europe and Central Asia, and a sharp rise in policy uncertainty has dampened the infrastructure investments outlook. Worse, there will be stronger headwinds on the private sector playing a more active role in filling the infrastructure gap as economic stimulus slows and credit conditions tighten.

Two thousand twenty-two will be a crucial year since it will offer important opportunities to ensure that the real progress in the post-pandemic recovery is sustained. On this note, the PPI Database team will continue to monitor and report on the post-pandemic trend of private infrastructure investment commitments.

### Appendix A: DEFI Agencies that Supported Projects in 2021

Multilateral	Bilateral	
	Development Institution	Export Credit Agencies
Asian Development Bank (ADB)	Access to Energy Fund	Export-Import Bank of China
AfDB	Banco do Nordeste	Export Development Canada
Asian Infrastructure Investment Bank (AIIB)	Brazilian Development Bank (BNDES)	Export Finance Australia
Black Sea Trade and Development Bank	Canadian Climate Fund for the Private Sector in Asia II	Export-Import Bank of Korea
CAF–Development Bank of Latin America	CDC Group	
Emerging Africa Infrastructure Fund (EAIF)	Development Bank of Southern Africa (DBSA)	
EBRD	DEG (German Investment Corporation)	
European Investment Bank (EIB)	FMO (the Dutch Development Bank)	
Green Climate Fund	Japan International Cooperation Agency (JICA)	
IDB Invest	Kreditanstalt fuer Wiederaufbau (KfW)	
IFC	Oesterreichische Entwicklungsbank AG	
Interact Climate Change Facility	Overseas Private Investment Corporation (OPIC)	
MIGA	Proparco	
OPEC Fund for International Development (OFID)	U.S. International Development Finance Corporation	
Private Infrastructure Development Group		
Sustainable Energy Fund for Africa		



## About the Private Participation in Infrastructure Projects Database

The Private Participation in Infrastructure Database is a product of the World Bank Group's Infrastructure Finance, PPPs and Guarantees Global Practice. Its purpose is to identify and disseminate information on private participation in infrastructure projects in low- and middle-income countries. The database highlights the contractual arrangements used to attract private investment, the sources and destinations of investment flows, and information on the main investors. The site currently provides information on more than 10,000 infrastructure projects dating from 1984 to 2021. It contains over 50 fields per project.

For more information, please visit: [ppi.worldbank.org](http://ppi.worldbank.org)





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