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Private Participation
in Infrastructure (PPI)
HALF YEAR UPDATE



WORLD BANK GROUP
Public-Private Partnerships

Acknowledgement & Disclaimer

This report was prepared by a team led by Deblina Saha and overseen by Cledan Mandri-Perrott, Head of Infrastructure Finance and PPPs. The core team includes Seong Ho Hong, Schuyler House and Chin-Han Chiang, with editorial inputs from David Lawrence and design by Victoria Adams-Kotsch. The team is very grateful for guidance and comments received from Laurence Carter, Jordan Schwartz, Clive Harris, Darwin Marcelo and Fernanda Ruiz-Nuñez.

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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H1 2017 Highlights

- Investment commitments involving private participation in low and middle-income countries for energy, transport and water infrastructure totaled US\$36.7 billion across 132 projects in H1 2017.
- Although H1 2017 investment could be showing signs of recovery with a 24 percent increase over H1 2016 level, it is still the second-lowest level of half-year investment in the past 10 years, and 15 percent lower than the half-year averages of the past five years.
- Indonesia was the destination for highest investment by value (US\$7.8 billion), while Pakistan and Jordan were new entrants to the top five. One-third of the H1 2017 global investment was accounted for by only five projects in these three countries.
- Sixty-eight out of 82 electricity generation projects were in renewables, accounting for 50 percent of total electricity generation investment and 47 percent of total capacity (5.6 gigawatts/11.9 gigawatts).
- Of the total investment¹, 75 percent was debt-financed, with 38 percent of debt raised from commercial debt providers. 79 percent of the debt raised was from international sources.
- Private sources financed 48 percent of investments . Public sources financed 23 percent, and DFI² sources 29 percent.

1 Investment amount of US\$26.4 billion across the 65 projects for which financing information was available.

2 Development Finance Institution (DFI) Sources refer to both multilateral and bilateral sources.

Executive Summary

Private Participation in Infrastructure (PPI) investment³ in H1 2017 increased by 24 percent, from US\$29.5 billion in H1 2016, to US\$36.7 billion. H1 2017 PPI investment levels are still lower than historical levels- 15 percent lower than half-year averages over the last five years and the second lowest level of investment in the past 10 years. The average project size increased marginally by three percent from US\$269 million in full-year 2016 to US\$278 million in H1 2017, while the number of projects dropped slightly from 138 to 132. H1 2017 saw seven projects with investment commitments higher than US\$1 billion. Interestingly, if we exclude such megaprojects we see a marked increase in the average project size from US\$156 million in full-year 2016 to US\$171 million in H1 2017.

East Asia and Pacific (EAP) received the highest level of PPI investment, overtaking Latin America and Caribbean (LAC) for the first time and accounting for over one-third of total global investment. Following EAP, LAC and South Asia (SAR) accounted for 27 percent and 17 percent of global investment, respectively. While all other regions saw an increase in investment as compared to H1 2016, investment in LAC declined slightly.

Indonesia was the destination for the highest amount of PPI investment, while Pakistan and Jordan were new entrants to the top five countries, joining Indonesia, Brazil, and China. Indonesia, Pakistan, and Jordan are amongst the top five highest PPI-investment countries because of a few multibillion-dollar power projects. Indonesia saw investments in US\$ 4.2 billion and US\$2.2 billion coal fired power plants, Jordan had a US\$2.1 billion investment in an oil shale-fired power plant, and Pakistan had investments in two hydropower plants worth US\$1.9 billion and US\$1.7 billion.

Thirty-three countries received PPI investments in H1 2017, of which 17 countries closed only one project each, and seven countries closed only two each. China (36 projects), India (22 projects), and Brazil (21 projects) were the only countries to receive investment in a larger number of projects. Indonesia, which saw the next-highest number of projects, closed only six projects, and the other countries saw fewer than five projects each.

The share of investment in IDA countries⁴ has risen from four percent of global investment in 2016, to six percent in H1 2017, with US\$2.1 billion worth of investments across 15 projects in 10 countries. This compares to 14 projects in six IDA countries in full-year 2016. Nine of these 15 IDA projects received multilateral support.

Energy continues to dominate sectoral investments. The energy sector received the largest amount of global investments, accounting for almost three-quarters of global H1 2017 investment, while transport accounted for 24 percent. Water and sewerage accounted for only three percent. While the

³ "Investment" refers to private investment commitments at the time of financial closure in energy, transport, and water projects serving the public in low- and middle-income countries, including natural gas transmission and distribution, but excluding oil and gas extraction.

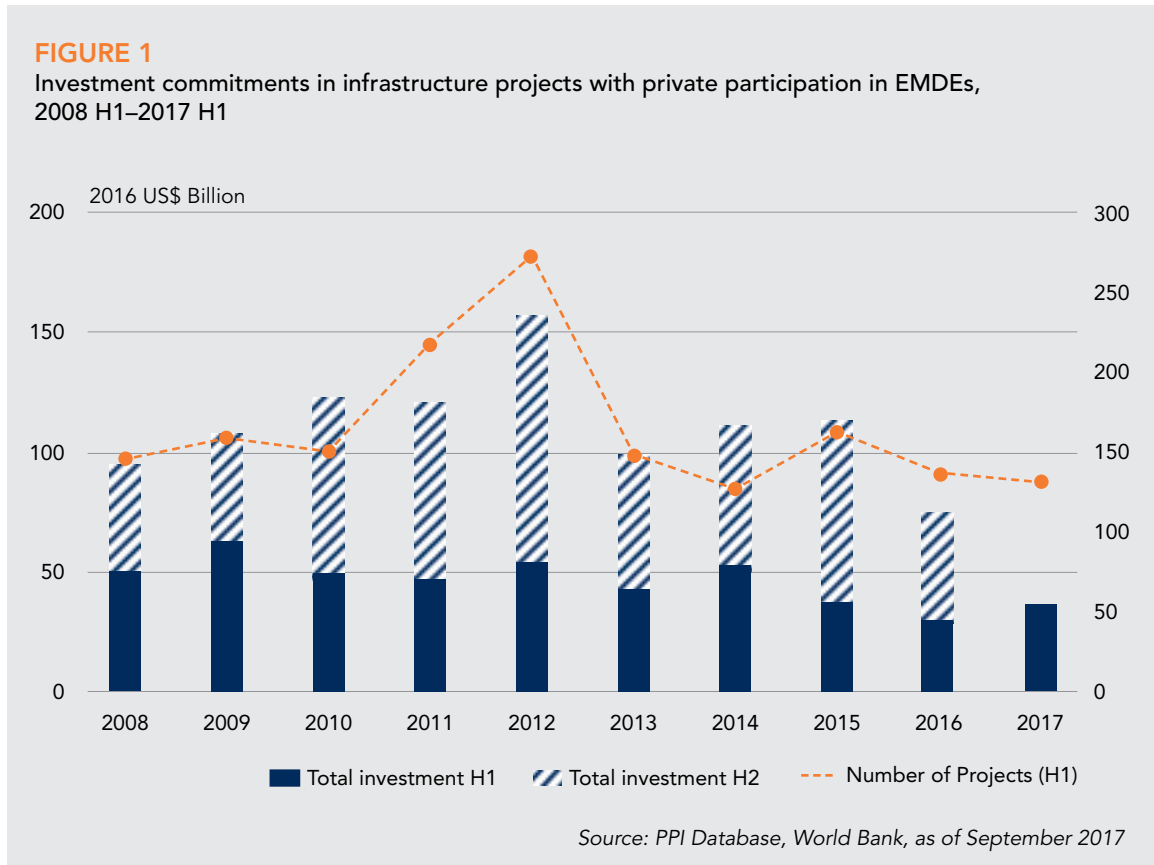
⁴ "IDA countries" refers to countries which are eligible for support from the International Development Association, the part of the World Bank that helps to world's poorest countries. More information on IDA can be found here: <http://ida.worldbank.org/>.

share of investment in water and sewerage has stayed consistent (albeit at around a low three percent) over the last five years, the share of energy investment has been increasing as the share of transport investment has been declining (except in 2015, due to the US\$35.6 billion Turkey airport project).

The strong focus on renewable energy projects continues. Eighty-three percent of the electricity generation projects were in renewables (68 out of 82 projects). By investment value, however, renewable energy projects captured only 50 percent of total electricity generation investment (compared to 60 percent in 2016, and 65 percent in 2015), with US\$11.9 billion. This reduced share is due to two coal megaprojects in Indonesia and an oil shale power project in Jordan, which together accounted for 36 percent of the total electricity generation investment. There was a megaproject in renewables as well, but excluding that, the average project size for renewable energy projects is US\$149 million.

1. Global PPI Investment Trends

PPI investment in H1 2017 totaled US\$36.7 billion across 132 projects, an increase of 24 percent over investments in H1 2016, but still significantly lower than historical levels for H1 (first half-year). The total investment recorded for H1 2017 is 15 percent lower than the past five years' H1 average investment level of US\$43.2 billion.



PPI investment in 2017 seems to be showing signs of recovery, as the investment level during the first half of the year is already slightly more than half of the full-year 2016 level, and historically, higher investment levels are typically recorded in the latter half of each year. This suggests that full-year 2017 investment levels could possibly be higher than those of 2016.

The number of projects dropped slightly from 138 in H1 2016 to 132 in H1 2017. The average project size increased marginally by three percent from US\$269 million in full-year 2016 to US\$278 million in H1 2017. This figure also marks a slight drop in project size below the average project size of US\$280 million for projects recorded over the past five years. Interestingly the median project size increased from US\$80 million to US\$99 million denoting that small- and medium-sized projects received higher investment commitments than in the previous year.

**TABLE 1: FREQUENCY DISTRIBUTION OF PROJECT SIZES
OVER THE LAST FIVE-YEAR PERIOD AND H1 2017**

Year	No. of Projects	Mean	Median	Maximum
2012	620	253	68	15,471
2013	409	241	90	3,720
2014	339	328	81	10,653
2015	334	339	81	36,035
2016	277	269	80	6,756
H1 2017	132	278	99	4,194

Source: PPI Database, World Bank, as of September 2017

In H1 2017, greenfield projects accounted for more than two-thirds of the total investment commitment, or US\$24.9 billion, while brownfield projects accounted for the remaining 32 percent, with US\$11.8 billion. There was only one management contract of US\$7 million for a water project in China; no divestiture transactions were recorded. The number of divestitures have been declining over time with only three recorded in full-year 2015, but in full-year 2016 there was a slight revival recorded with seven divestitures. Among greenfield projects in H1 2017, projects adopting a build, operate, and transfer (BOT) model account for US\$14.2 billion of investments, followed by build, own and operate (BOO) model projects, with investments of US\$8.9 billion.

2. Regional PPI Investment Trends

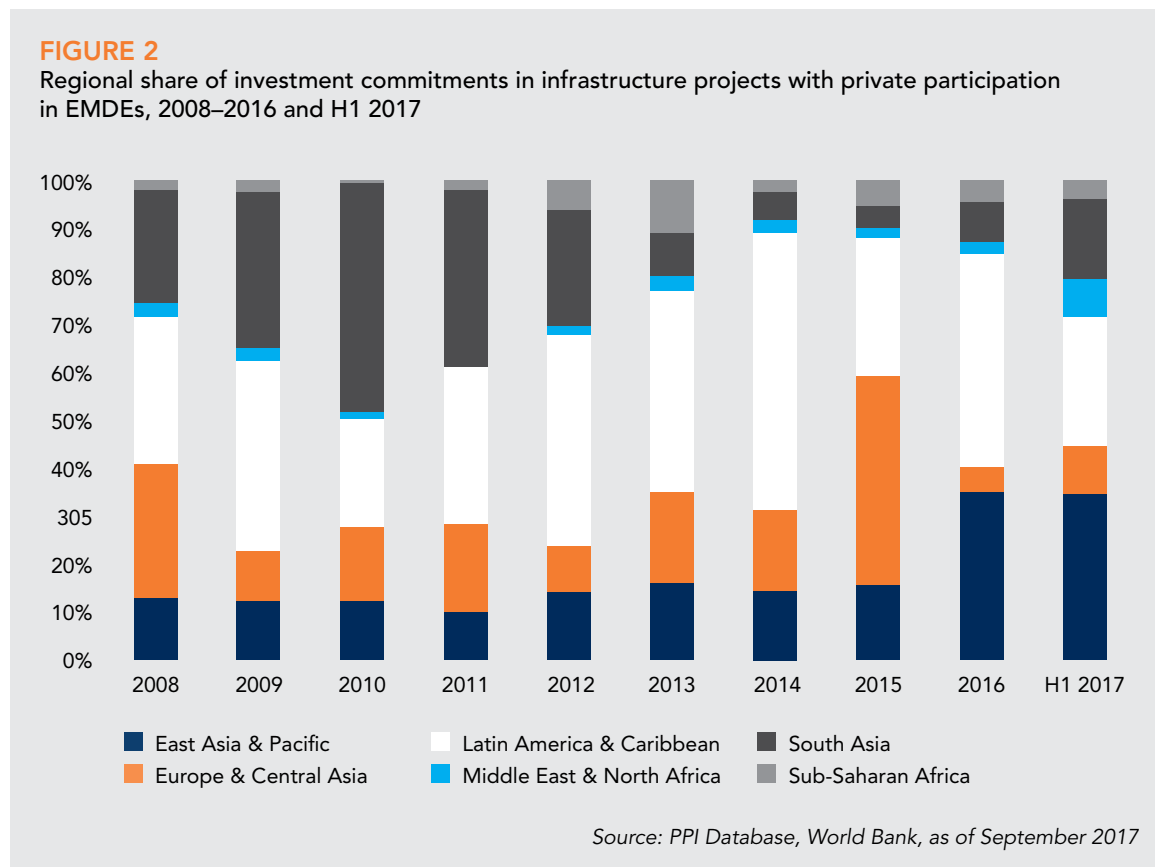
LAC's share of global investments has been on the decline since 2014 (mainly because of Brazil), whereas EAP and SAR account for greater shares.⁵ In H1 2017, LAC was also the only region where investment declined slightly compared to H1 2016 levels, while all other regions saw increases in investment levels.

Regionally, EAP received the highest level of PPI investment in H1 2017 (US\$12.7 billion), led by China and Indonesia. The region's 48 new PPI projects account for more than one third (35 percent) of total global investment during the first half-year of 2017. China and Indonesia together account for 91 percent of EAP PPI investments in H1 2017. In China, 36 projects received investments amounting to US\$3.7 billion, which accounted for 29 percent of EAP investment, while Indonesia captured 62 percent of total EAP regional investment (US\$7.8 billion) with only six projects. Several large projects in Indonesia, including two multibillion-dollar coal fired power projects (worth US\$4.2 billion and US\$2.2 billion) also made it the country with the highest PPI investment level globally. While PPI investment for China relative to its global counterparts appears large, it is a small proportion of the GDP or the total infrastructure spend in the country.

While LAC enjoyed the second highest level of investment (US\$9.8 billion), accounting for 27 percent of global investment, this marked a decrease from H1 2016 levels. This decrease was driven largely by

⁵ The distribution is skewed in 2015 due to a US\$35.6 billion airport project in Turkey, which accounts for ECA's expanded share. If this project is removed from consideration, the pattern of declining shares for LAC between 2014 and 2016 is apparent.

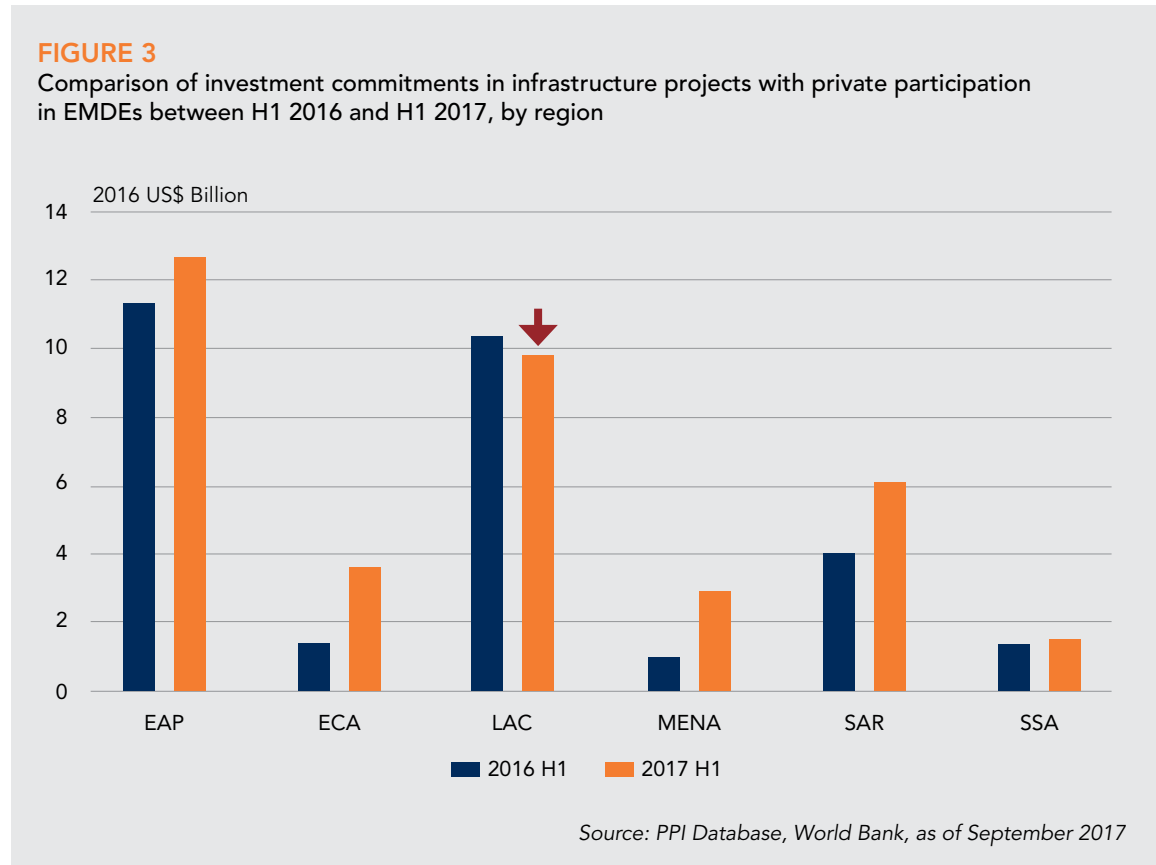
fewer projects as opposed to decreased project size (only 30 projects in H1 2017 as compared to 48 in H1 2016) and in part, by a lack of PPI activity in Panama, which had significant investments in five PPI projects in H1 2016. In line with previous years, Brazil accounted for majority share (65 percent) of LAC investments at US\$ 6.4 billion, though PPI investment in Brazil in H1 2017 decreased by US\$1.3 billion compared to H1 2016. The largest project by investment value in LAC is the US\$ 1.7 billion electricity transmission project Belo Monte Transmissora de Energia, sponsored by the State Grid Corporation of China.



SAR's 17 percent share of H1 2017 global PPI investment may mark the reversal of a regional trend of declining shares of global investment, which reached a low of four percent in 2015. H1 2017 investment in SAR has already reached the full-year 2016 level, driven by the financial closure of two power megaprojects in Pakistan – the Suki Kinari Hydropower Plant worth US\$1.9 billion and the Karot Hydropower Plant worth US\$1.7 billion.

H1 2017 PPI investment in Middle East and North Africa (MENA) tripled compared to the level in H1 2016 and has already surpassed the region's full-year 2016 investment level. This increase is driven primarily by investment in Jordan, where a US\$2.1 billion oil shale-fired power plant reached financial closure in H1 2017. Three additional projects in the region include a port project in Egypt and solar power projects in Morocco and Jordan.

PPI investment in Europe and Central Asia (ECA) has already reached 89 percent of the 2016 full-year investment value because of two sizeable road projects in Russia and Turkey.



In Sub-Saharan Africa (SSA), eight countries received PPI investment. Along with ECA, SSA is the only other region where PPI investment in the transport sector exceeds that of energy. Of note is the US\$550 million liquefied natural gas (LNG) import terminal in Ghana, which accounts for more than a third of SSA's PPI investments in H1 2017.

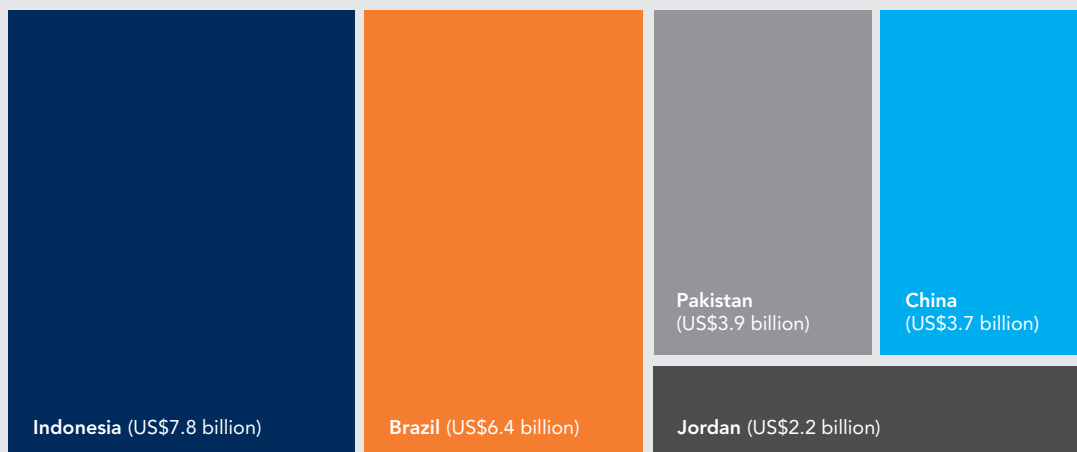
3. Country Level Trends

3.1 TOP COUNTRIES BY INVESTMENT

The top five countries with the highest amount of investments in H1 2017, in order of investment level, were Indonesia with six projects, Brazil with 21 projects, Pakistan with three projects, China with 36 projects, and Jordan with two. These five countries together accounted for two-thirds of global investments and approximately half of the projects that received investments in H1 2017.

FIGURE 4

Top Five Countries by investment commitments in infrastructure projects with private participation in EMDEs in H1 2017



Source: PPI Database, World Bank, as of September 2017

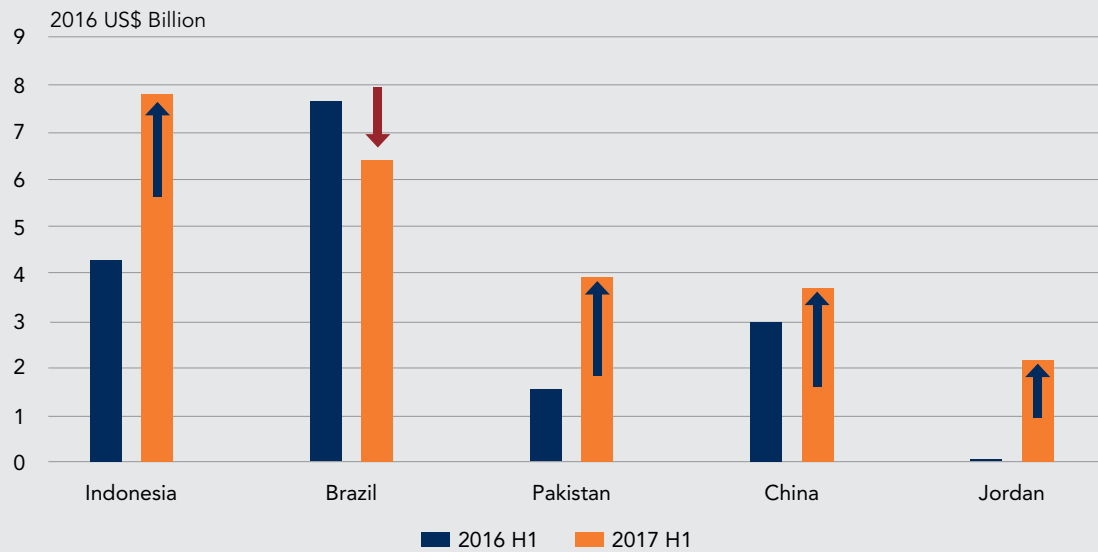
Indonesia received the highest amount of PPI investment in H1 2017, with investments of US\$7.8 billion across six projects, accounting for 21 percent of global investment commitments. Five of the projects were in the energy sector, including three large coal fired power plant projects. These three coal power projects, with total generation capacity of 3.2 gigawatts, alone total US\$6.9 billion. Interestingly, all five energy projects in Indonesia were financed by international banks, including multilaterals rather than domestic banks.

Pakistan and Jordan were new entrants to the top-five investment list, with just three and two projects, respectively. The PPI projects in these countries included several megaprojects, including a US\$2.1 billion oil shale-fired power plant in Jordan, and two hydropower plants in Pakistan, worth US\$1.9 billion and US\$1.7 billion, respectively.

It is interesting to note that due to a few multibillion-dollar power projects, all top-five countries apart from Brazil and China made the cut. Moreover, China (with 36 projects), India (with 22 projects), and Brazil (with 21 projects) were the only countries that received investment in a significant number of projects. Also, Brazil was the only country in the top-five list which saw a decreased level of investment.

FIGURE 5

Comparison of H1 2016 and H1 2017 investment commitments in infrastructure projects with private participation in top-five countries



Source: PPI Database, World Bank, as of September 2017

3.2 INVESTMENT IN IDA COUNTRIES

PPI investment in IDA countries in H1 2017 has already reached 70 percent of the entire full-year 2016 investment volume. The share of global PPI investment accounted for by IDA countries has risen from four percent in 2016, to six percent in H1 2017, with investments of US\$2.1 billion committed to 15 projects in 10 countries. This compares to 14 projects in six countries in full-year 2016. Pakistan was the only blended country to receive PPI investment in H1 2017.

Of the 15 new IDA PPI projects in H1 2017, nine received multilateral support. Detailed financing information was available for 13 of the 15 IDA PPI projects. Multilateral debt played a major role in financing infrastructure projects in IDA countries, accounting for 60 percent of the total debt flowing to IDA projects and covering 47 percent of the investment commitments. Commercial lenders were the next most active financiers, contributing 15 percent of committed investments, whereas bilateral⁶ debt is contributing 13 percent.

Madagascar and Mali recorded PPI projects after over ten years of inactivity (Mali's last PPI commitment was recorded in 2003 and Madagascar's was in 2007). Notably, Madagascar's sole new PPI project, the Ivato and Fascene Airports project, was the only one to receive joint support from MIGA and IFC.

⁶ "Bilaterals" denote agencies of one specific government, which are usually development agencies or export-credit agencies, which have a mandate to support domestic businesses in pursuing investments abroad.

TABLE 2: INVESTMENT COMMITMENTS AND NUMBER OF INFRASTRUCTURE PROJECTS WITH PRIVATE PARTICIPATION IN IDA COUNTRIES IN H1 2017

Country	Total Investment (US\$ millions)	Number of Projects
Cambodia	\$13	1
Ghana	\$550	1
Madagascar	\$245	1
Mali	\$136	1
Mozambique	\$84	1
Myanmar	\$315	1
Nepal	\$257	4
Rwanda	\$362	2
Senegal	\$88	2
Uganda	\$19	1
IDA Total	\$2,070	15

Source: PPI Database, World Bank, as of September 2017

4. Sector Trends

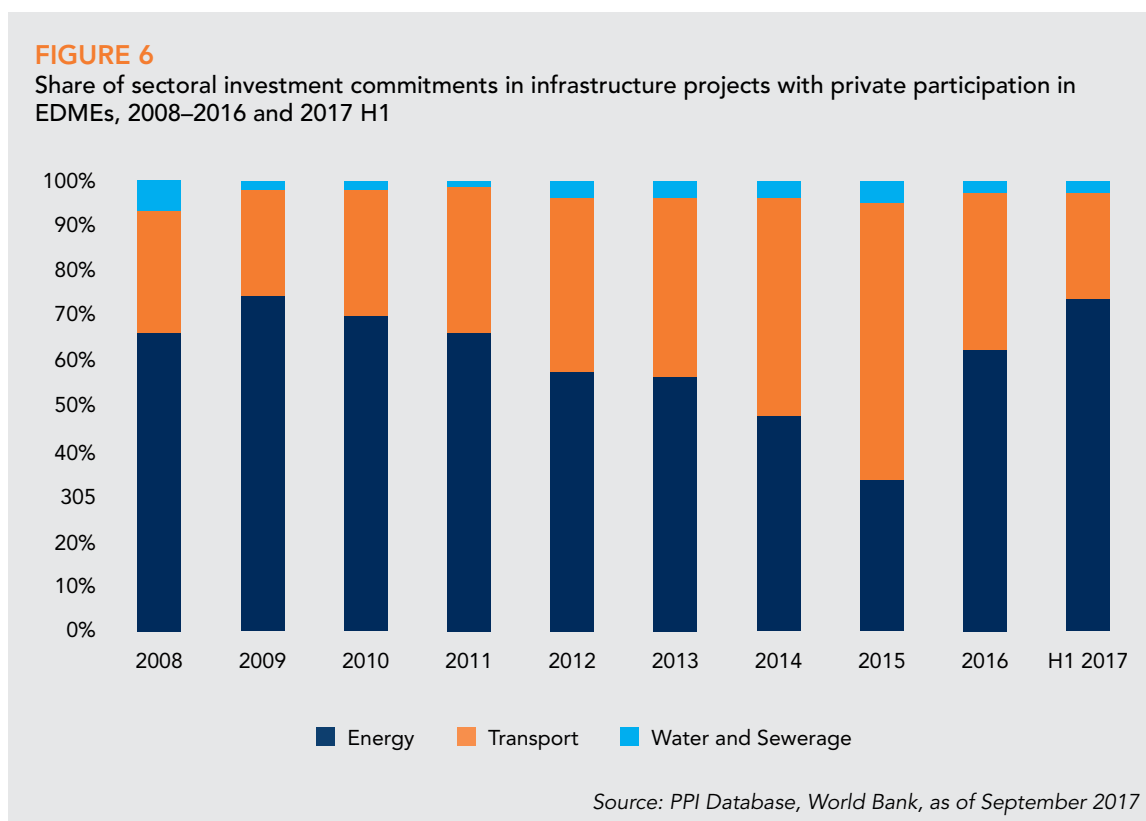
Energy was the most dominant sector for H1 2017 investment, accounting for three-quarters of global investments. The sector has also been experiencing a gradually-increasing share of overall investment since 2015. Within the energy sector, Indonesia received the largest volume of PPI investment, followed by Brazil, Pakistan, and Jordan.

Transport accounted for 24 percent of investment in H1 2017; water and sewerage accounted for only three percent. The low share of PPI investment in water and sewerage has been consistently recorded at around three percent over the last five years, whereas the share of investment in the transport sector has been generally declining since 2015.

Within the energy sector, a strong focus on renewables continues: 83 percent of new electricity generation projects in H1 2017 use renewable energy (68 out of 82 projects). By investment value, however, renewable energy projects captured only 50 percent of electricity generation investment, with US\$11.9 billion worth of investment. As a share of total capacity, renewable energy projects accounted for 47 percent with a capacity of 5.6 gigawatts of energy out of total capacity of 11.9 gigawatts. The relatively lesser investment and capacity share is due to high investments in traditional energy sources, specifically two coal megaprojects in Indonesia and the oil shale power project in Jordan, which in combination account for 36 percent of total electricity generation investment.

Solar power, including PV, CPV, and CSP technologies, attracted the most renewable energy investment in H1 2017. Of 29 solar PPI projects recorded in H1 2017, 13 are in China and seven in India. Wind was the next prominent renewable technology, with 16 projects recorded over this period. Brazil had seven wind projects, while India had four. Going by capacity, hydro projects led the way with cumulative capacity of 1.9 gigawatts, followed by wind and solar both with cumulative capacity of 1.7

gigawatts. This compares to cumulative capacity of 3.2 gigawatts for three coal projects and 2.6 gigawatts for seven projects using natural gas. Further, five new projects, all located in China, utilize waste to generate power.



Transport sector PPI investment commitments totaled US\$8.7 billion in H1 2017, an amount equivalent to 34 percent of 2016’s full-year PPI commitments in the sector. Of the 31 transport projects that reached financial closure in H1 2017, 19 were road projects, and eight were ports. Russia led transport PPI investments with US\$2.0 billion in two transport projects.

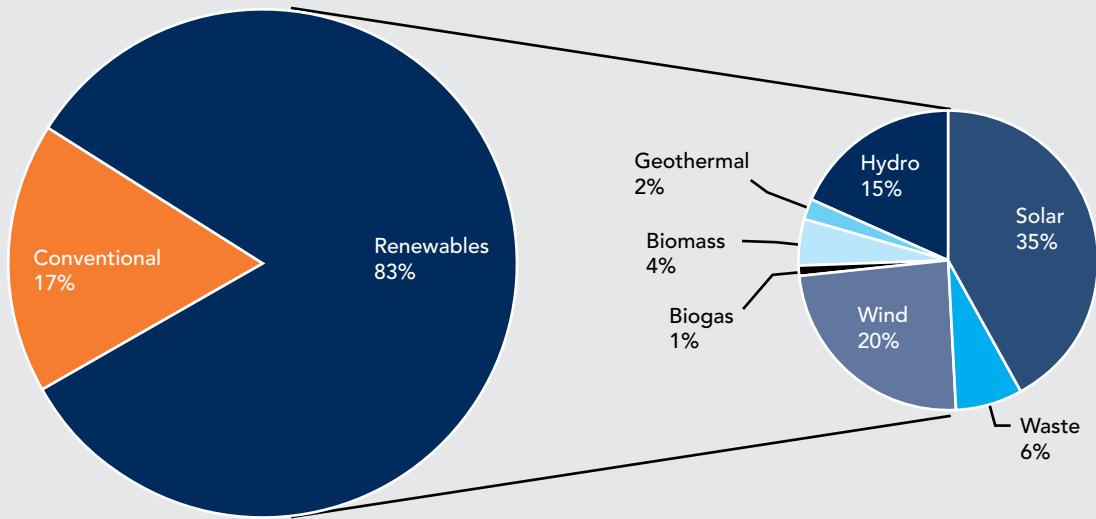
Road transport projects attracted the most investment in transport in H1 2017, with US\$5.8 billion in 19 projects. This nearly doubled the US\$3 billion committed to roads in H1 2016, during which period road investments declined and railways received the largest volume of transport investments. The increase is likely a return to typical levels of road PPI investment.

Ports captured the second-highest PPI investment totals, with US\$2.4 billion committed to eight projects. The largest deal was the Port Vera Coal Terminal project in Russia, whose total investment commitment is US\$664 million.

Fifteen water projects received investment in H1 2017, of which 12 are in China. Other recipients of PPI investment in the water sector include Brazil and Indonesia. By subsector, 13 of the 15 deals were in water treatment plants, and two were in water utilities projects.

FIGURE 7

Investment commitments in infrastructure projects with private participation in the energy sector in EMDEs in 2017 H1, by technology (N=82)



Distribution is provided across 82 recorded projects in the energy sector in H1 2017.

Source: PPI Database, World Bank, as of September 2017

5. Financing Trends

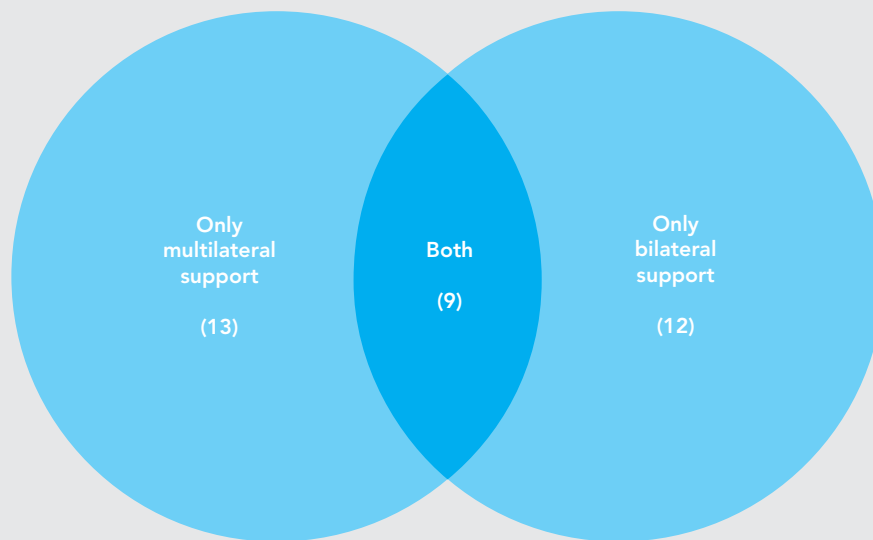
5.1 DEVELOPMENT FINANCE INSTITUTION (DFI) SUPPORT

In H1 2017, a quarter of all new projects (34 projects) received some form of development finance institution (DFI) support. Of these, nine projects received both multilateral and bilateral support, while 13 projects received only multilateral support, and 12 projects received only bilateral support (See Figure 8).

The DFIs provided direct debt support of US\$5.8 billion, of which almost three quarters was provided by bilateral institutions amounting to US\$4.3 billion. The multilateral institutions provided US\$1.5 billion worth of direct loans to 22 projects, accounting for four percent of total investment and syndication support of US\$201 million to five projects. IFC supported 13 projects, contributing US\$0.6 billion in debt (A-Loan) and facilitating syndication for three projects for US\$129 million (B-Loan). MIGA extended a US\$0.9 billion guarantee to a power project in Mexico and a US\$85 million guarantee to an airport project in Madagascar.

The loan activity of Asia Infrastructure Investment Bank (AIIB) was recorded in the PPI database for the first time. IFC, Asian Development Bank (ADB), and AIIB co-financed a US\$315 million Myingyan Gas-Fired Power Plant (225 megawatts) in Myanmar along with four other international commercial banks.

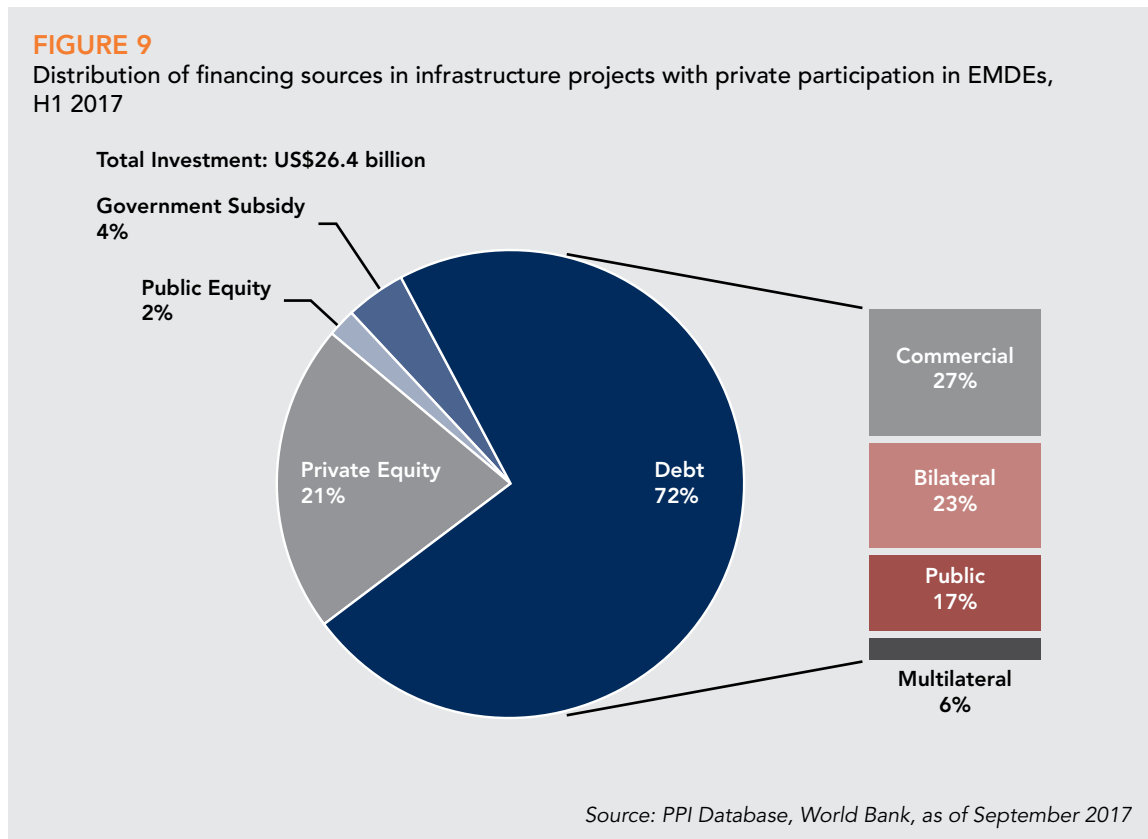
FIGURE 8
Number of infrastructure projects with private participation getting multilateral, bilateral and joint support from DFIs in H1 2017



Source: PPI Database, World Bank, as of September 2017

5.2 SOURCES OF FINANCING

Detailed financing information was available for approximately 70 percent of the projects (65 out of 96 projects, excluding China's 36 projects, for which no financing information was available). The combined investment commitment of US\$26.4 billion for these 65 projects was dedicated completely to building physical assets, with no investments earmarked for government fees. Figure 9 provides a detailed breakdown of the sources of financing for these projects.



With respect to the distribution of finance amongst public, private and DFI sources, out of the total capital investment of US\$26.4 billion, 48 percent of the investments were financed by private sources (US\$12.7 billion); 23 percent by public sources (US\$6.1 billion); and 29 percent by DFI sources (US\$7.7 billion).

The total equity of US\$6.3 billion for the 65 projects was majority financed by private sponsors accounting for 91 percent of total equity or US\$5.7 billion. The remaining nine percent, or US\$550 million, was financed by the SOEs partners in the joint venture projects. Seven projects recorded government financing of US\$1.0 billion (four percent of total investment for which financing information was available) via upfront capital grants.

Almost three quarters (73 percent) of the total investment was debt financed, and 38 percent of the debt raised was from commercial debt providers. One geothermal energy project in Indonesia (US\$587 million) which raised debt from commercial sources had also received a payment guarantee from the government. Only one energy project in Argentina (US\$175 million) received financing from an institutional investor alongside two other commercial lenders.

Bilateral institutions accounted for 31 percent of the total debt raised; public financing institutions accounted for 23 percent; and multilaterals accounted for only eight percent of the total debt. Seventy-nine percent of the total debt raised was from international sources, while 21 percent was from domestic debt providers. Table 3 below summarizes the sources of debt by region.

In H1 2017, the region with the highest reliance on commercial debt was ECA, where 89 percent of total debt raised was from commercial sources. EAP and LAC also had heavy reliance on commercial debt (48 percent of total debt raised in both regions). SSA was the only region where multilateral debt was more than a half the total debt raised (at 66 percent). In the other five regions, the share of multilateral debt was less than 15 percent.

	Total Debt Funding (US\$ billion)	Commercial Debt (% of total debt)	Multilateral Debt (% of total debt)	Bilateral Debt (% of total debt)	Public Debt (% of total debt)	Projects analyzed/total projects
EAP	\$6.5	48%	3%	48%	1%	10/12*
ECA	\$0.8	89%	9%	2%	0%	5/10
LAC	\$4.9	48%	0%	4%	47%	17/30
MENA	\$2.2	10%	13%	23%	54%	4/4
SAR	\$4.0	17%	10%	51%	22%	21/29
SSA	\$0.7	1%	66%	25%	8%	8/11
Global	\$19.2	38%	8%	31%	23%	65/96

*excluding China

Source: PPI Database, World Bank, as of September 2017

In H1 2017, bilateral debt played an important role in PPI project financing, accounting for nearly a quarter of total investment. The bilateral share of total debt raised was highest in SAR at 51 percent, while it was 48 percent in EAP. Moreover, in SSA and MENA, the share of bilateral debt was 25 and 23 percent respectively.

Public sources were the major contributor of debt in MENA, accounting for 54 percent of the total debt. LAC also had heavy reliance of public debt, in line with historical levels.

About the Private Participation in Infrastructure Projects Database

The Private Participation in Infrastructure Database is a product of the World Bank Group's Infrastructure, PPPs and Guarantees team. 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 destination of investment flows, and information on the main investors. The site currently provides information on more than 8,000 infrastructure projects dating from 1984 to 2017 H1. It contains over 50 fields per project record, including country, financial closure year, infrastructure services provided, type of private participation, technology, capacity, project location, contract duration, private sponsors, debt providers, and development bank support.

For more information, please visit: ppi.worldbank.org

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