Long-term investing of large pension funds and public pension reserve funds 2022

OECD

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This is the ninth edition of an annual OECD survey of large pension funds and public pension reserve funds that collects long-term investment data since it was first established in 2011. The scope of this report covers 88 public and private pension funds from 39 countries. This survey is based on a qualitative questionnaire sent directly to large pension funds and public pension reserve funds. It covers the infrastructure investment made by large pension funds and public pension reserve funds, but also their approach to environmental, social, and governance (ESG) factors. It helps provide detailed investment information and insights which complement the aggregated data on portfolio investments gathered by the OECD at a national level through the Global Pension Statistics and Global Insurance Statistics projects.

Foreword

Institutional investors are viewed as sources of long-term capital with investment portfolios built around two main asset classes (bonds and equities) and an investment horizon tied to the often long-term nature of their liabilities. Institutional investors have progressively diversified portfolios by adding allocations to alternative investments such as private equity, real estate, infrastructure and hedge funds.[1] However, despite the increasing interest in alternative investments, official data on pension fund investment in alternatives – and in particular, infrastructure – is scarce. National statistical agencies do not currently collect separate data on these investments and the different forms available to investors to gain exposure to these asset classes means that information is often buried under different headings, such as private equity or alternative investments.[2] There is also the challenge of different reporting regimes which can make the classification of assets inconsistent between different jurisdictions.

This survey collects data from individual pension funds that are amongst the largest in their respective economies, and comparatively, amongst the largest in the world.[3] The data complement insights and detailed administrative data gathered at the national level.[4] The scope of this report covers funds from OECD member countries, G20 member countries and APEC economies, based on data collected for the year ending 2021.

The results highlight the depth and breadth of institutional investors, the importance of long-term capital and the role that pension savings can play in an economy. While the data covers the general state of long-term investment, which will be of prime value to the ultimate investors, it can also be used to inform regulators and other policy makers to help them better understand the operation of institutional investors in different countries. By analysing pools of long-term savings in domestic markets, and also in foreign markets where funds may invest a large portion of assets outside of their home country, policy makers can gain insights into the drivers behind asset allocation decisions and the conditions needed to attract long-term savings.

The survey reviews the trends in assets and asset allocation of 88 large pension funds (LPFs) and public pension reserve funds (PPRFs),[5] which in total managed USD 10.8 trillion in assets in 2021. In total, 75 LPFs and 13 PPRFs or Sovereign Wealth Funds (SWFs) with a pension focus completed the survey. The LPFs covered in the survey together encompassed asset under management (AuM) of USD 4 trillion and PPRFs 6.8 trillion. Altogether, data was compiled from funds representing 39 countries around the world, including non-OECD countries, such as Brazil, India, Nigeria and South Africa.

The OECD Pension Statistics, which show administrative pension fund data gathered on a national level, showed an amount of USD 38.5 trillion pension fund assets in 68 reporting jurisdictions at the end of 2021, with the preliminary results.[6] This survey covers USD 10.8 trillion of pension fund assets, which represents 28.1% of the global amount.

This report includes a summary of key trends observed in the investment portfolios of LPFs and PPRFs, an analysis of infrastructure investment by LPFs and PPRFs, an analysis of ESG investment by LPFs and PPRFs and an analysis of sustainable and ESG considerations in infrastructure investment by LPFs and PPRFs.

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Executive summary

The OECD has been conducting an annual survey of Large Pension Funds (LPFs) and Public Pension Reserve Funds (PPRFs) since 2011. This exercise is done in the framework of the OECD Task Force on Long-term Investment Financing for the purpose of tracking trends in investment amongst the largest pension funds globally.

This year's annual survey gathers data for the year 2021. 75 LPFs responded which covers USD 4 trillion assets under management (AuM). Thirteen PPRFs responded which covers USD 6.8 trillion in AuM.

The OECD Pension Statistics, which collects administrative pension fund data gathered on a national level, has global data covering USD 38.5 trillion pension fund assets in 68 reporting jurisdictions were available globally at the end of 2021 for preliminary 2021 results. This report covers USD 10.8 trillion of pension fund assets, which represents 28.1% of the global amount presented in the OECD Pension Statistics.

Data was collected from funds based in 39 countries, including non-OECD countries. 46 funds are based in Europe, 12 in Asia Pacific, which includes Australia, India, Japan and New Zealand, 12 countries in Africa, including Nigeria and South Africa, and 11 funds in Latin America. Five funds are based in North America and two in the Middle East.

Average pension fund assets of surveyed LPFs increased from USD 36.5 billion to USD 52 billion from 2015 to 2021, and average size of assets managed by PPRFs increased from USD 191.3 billion in 2015 to USD 521.7 billion in 2021. There has been marked by a nearly three-fold increase of average PPRFs assets, relative to the 1.5 times growth of average LPFs. The overall market growth of this period is partly a reflection of valuation gains in real assets. From 2016 to 2020, the global AuM is expected to have grown 4% from USD 73.9 trillion to USD 103.1 trillion,[7] so the growth of pension fund assets is above the global market.

In terms of **asset allocations**, the asset class that saw the largest increase was private equity, which grew on an average 41.4% from 2020 for LPFs and 48.1% for PPRFs. Unlisted infrastructure investment increased by 25.2% on average for LPFs and 5.1% for PPRFs. However, the average asset allocation of LPFs and PPRFs was 39.2% of total assets invested in fixed income and 32.4% in listed equity, which reflects the global trend of pension fund allocation of investing 75% of their assets primarily in bonds and equities.[8]

Funds based in OECD countries invested, on average, 62.4% of their total investments abroad. On average, of all funds' **foreign investments**, the most was invested in North America (47.3%) and Europe (40% on average). On average, all funds invested 4.9% of foreign investments in emerging Asia, 1.8% in emerging Europe and 1.4% in emerging Latin America, 1.2% in Africa and 0.3% in the emerging Middle East. This indicates that foreign investment by LPFs and PPFRs outside of the advanced markets of Europe and North America have been very limited.

Overall **investment in infrastructure** in 2021 was limited relative to the total assets under management of funds (i.e. 87 funds with USD 10.6 trillion). Infrastructure investment in the form of unlisted equity, listed equity and debt was USD 211.8 billion, representing 2% of the total assets under management of the entire survey population.

44 funds indicated to have invested in unlisted infrastructure equity, with an average of 2.2% of their total investment. 21 funds reported to have invested in listed infrastructure equity, with an average of 3.9% of their total investment. 31 funds reported having infrastructure debt, an average of 3.8% of total investment.

Most investments in **unlisted infrastructure equity in terms of sector** were made in energy, followed by transport, IT and communication, and renewable energy. Energy was the largest component with an average of 16.1%, followed by IT and communications at 12.8%, energy transmission at 11.5%, and transport at 11.2%.

When LPFs and PPRFs ranked their **ESG considerations**, governance appears to be the strongest element that is considered. Among environmental considerations, climate change is the aspect most taken into account in investments with 23 funds reporting strong commitments, followed by carbon emissions, pollution and waste, and biodiversity being the least considered environmental component.

With regard to the social component of ESG, human rights was the aspect for which most funds reported strong commitment, followed by human capital, community involvement and the supply chain.

1 Large pension fund and public pension reserve funds' investment portfolios

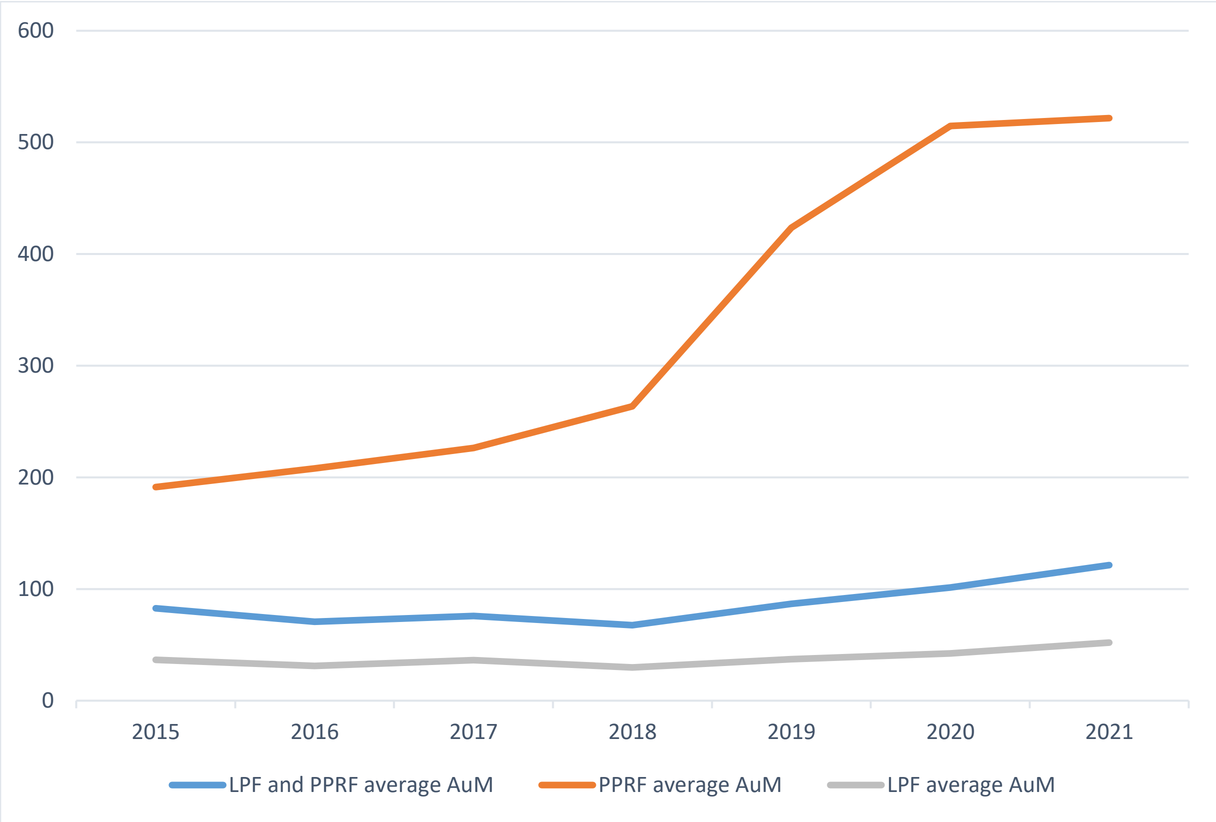
The total amount of assets under management (AuM) for the large pension funds (LPFs) and Public Pension Reserve Funds (PPRFs) covered by the survey was approximately USD 10.8 trillion at the end of 2021 (Table 1). Within the countries for which the OECD received data, the Netherlands has two of the largest funds: ABP at USD 676.6 billion and PFZW at USD 314.2 billion. CalSTRS based in the United States marked USD 440.1 billion. Australia's AustralianSuper at USD 191.3 billion, Sweden's Alecta at USD 136.2 billion and South Africa's GEPF at USD 131.6 billion also ranked high in the list. As for PPRFs, the largest reserve was held by the US Social Security Trust Fund at USD 2.9 trillion, followed by Japan's Government Pension Investment Fund at USD 1.7 trillion. Norway and Canada also accumulated large reserves, at USD 1.5 and 0.4 trillion respectively.

Total AuM, measured in local currency, increased by 18.2% on average between 2020 and 2021. Funds in many countries posted exceptionally strong increases, particularly in Canada, Australia, and Nigeria. Funds in Australia grew strongly in 2021: Hostplus grew by 48.6%, AustralianSuper by 27.9%, UniSuper by 20.1% and CBUS by 16.6%. Some Funds in Europe also increased by sizeable amounts. Iceland's LSR increased 32.4% and Pension Fund of Commerce 18.5%, and Sweden's Alecta 18.4%. Only two funds showed a decrease in assets in 2021. The Swedish AP6 increased by 58% from 2020. Four other funds showed high growth rates: the Australian Future Fund, the New Zealand Superannuation Fund, the Canadian CPP Investments and the Swedish AP2 at 19.1%, 16.6%, 15.7% and 15.2%.

Figure 1 shows the average AuM of pension funds included in the survey from 2015 to 2021, which shows an increase in the average AuM from USD 82.7 billion in 2015 to USD 121.4 billion in 2021.The asset class that saw the largest increase in allocation by LPF and PPRFs was private equity, which grew on an average 41.4% from 2020 for LPFs and 48.1% for PPRFs (Figure 2). The Japanese PPRF increased its private equity investment from USD 589 million in 2020 to USD 2.7 billion in 2021. Unlisted infrastructure investment increased by 25.2% on average for LPFs and 5.1% for PPRFs. The Swedish LPF Alecta had the largest increase in unlisted infrastructure investment from USD 153.2 million in 2020 to USD 1.2 billion in 2021. PPRFs also increased investments in land and buildings by 18% on average compared to the previous year of 2020. The average change in asset allocation to cash and deposits for PPRFs decreased by 25.2% (Figure 2).

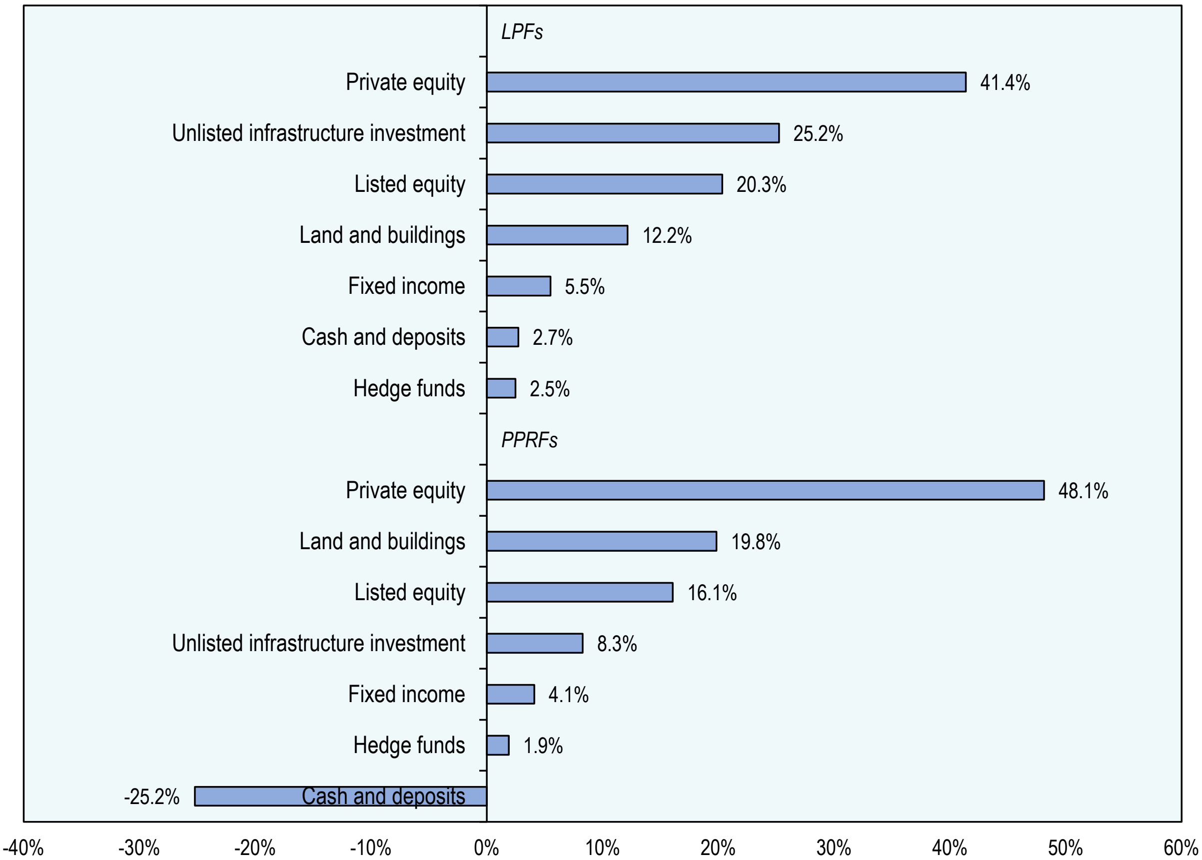
Figure 1. Average pension assets of LPFs and PPRFs, 2015-21

USD billion



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 2. Average percentage change of asset allocation, 2020-21



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Table 1. Pension fund assets under management, 2021

Country head office	Name of the fund or institution	Total investments or assets (1)	
		USD bn.	% change in AUM (compared to the previous year)
LPFs			
Netherlands	Stichting Pensioenfonds ABP	676.6	4.4
United States	CalSTRS	440.1	15.6
Netherlands	PFZW	314.2	9.3
Australia	AustralianSuper	191.4	27.9
Hong Kong	MPF	151.6	3.7
Sweden	Alecta	136.2	18.4
Mauritius	Rogers Pension Fund	136.0	24.4
South Africa	GEPF	131.6	27.5
Netherlands	PMT	111.1	13.5
United Kingdom	USS	110.4	21.6
Canada	AIMCo	107.4	16.4
Canada	OMERS	106.7	12.7
Denmark	PFA	97.2	7.2
Denmark	Danica Pension	77.8	4.0
Finland	KEVA	75.7	15.2
Australia	UniSuper	73.8	20.1
Netherlands	PME	71.1	10.2
Finland	Varma	66.8	17.7
Israel	Menora-Mivtachim	59.2	19.8
Australia	Hostplus	56.6	48.6
Croatia	AZ Mandatory Pension Fund B	52.1	9.1
Australia	CBUS	50.0	16.6
Canada	LAPP	48.6	19.5
Switzerland	Publica	47.8	3.6
Denmark	Pension Denmark	46.9	14.2
Croatia	Raiffeisen Mandatory Pension Funds	45.2	10.3
Brazil	Previ	42.6	1.3
Mexico	Afore Profuturo	41.3	16.4
Israel	Harel	39.2	22.7
United Kingdom	Greater Manchester Pension Fund	37.8	12.3
India	SBI Pension Fund	36.3	27.4
Israel	Makefet	32.2	18.0
India	LIC Pension Fund	26.8	27.1
India	UTI Retirement Solutions	26.0	21.8
Croatia	PBZ CO	24.6	11.5
Croatia	Erste Plavi	23.2	16.3

Country head office	Name of the fund or institution	Total investments or assets (1)	
		USD bn.	% change in AUM (compared to the previous year)
Switzerland	Pensionskasse Post	19.5	3.5
Brazil	Petros	17.7	1.6
Italy	Cometa	15.4	6.6
Peru	AFP Integra	12.2	-19.6
Iceland	Lifeyrissjodur Starfsmanna Rikisins	10.3	32.4
Nigeria	Stanbic Retiree RSA Fund	9.5	13.7
Nigeria	Stanbic IBTC Pension Managers	9.5	13.7
Italy	Fonchim	9.4	10.6
Iceland	Pension Fund of Commerce	9.2	18.5
Austria	VBV Pensionskasse	9.1	6.1
Ireland	Bank of Ireland	8.2	6.7
Turkey	OYAK	6.1	9.0
Italy	Fonte	5.7	8.1
Brazil	Banesprev	5.0	1.9
Brazil	Valia	4.9	7.9
Romania	Azt Viitorul Tau	4.4	42.5
Iceland	Birta	4.2	16.5
South Africa	Transnet Retirement Fund	4.1	3.7
Portugal	CGD Pensoes	4.0	5.4
Brazil	Sistel	3.8	7.0
Spain	Fonditel	3.5	4.4
Brazil	Forluz	3.3	4.4
Brazil	Real Grandeza	3.2	-3.9
South Africa	Sentinel Retirement Fund	2.8	9.7
Spain	Ibercaja	2.4	11.2
Belgium	EUROCONTROL	2.4	9.6
Portugal	Banco BPI	2.1	9.2
Nigeria	SNCPFA	1.9	-5.5
Nigeria	Premium Pension Limited	1.9	13.3
United Kingdom	Rolls-Royce and Bentley PF	1.9	16.3
Costa Rica	Vida Plena	1.7	12.8
Costa Rica	Operadora de Pensiones Complementarias	0.4	24.9
Mauritius	Sicom Pooled Private Pension Fund	0.2	9.8
Turkiye	Isbank	0.2	3.8
Mauritius	MCB	0.2	21.0
Mozambique	Insurance Supervisory Institute	0.2	18.9
Mauritius	Swan	0.2	22.3
Mauritius	IBL Pension Fund	0.1	27.7

Country head office	Name of the fund or institution	Total investments or assets (1)	
		USD bn.	% change in AUM (compared to the previous year)
Romania	Raiffeisen Acumulare	0.0	13.8
Total LPFs		**4 013.2**	**7.2**
PPRFs			
United States	Social Security Trust Fund	2 852	-1.9
Japan	Government Pension Investment Fund	1 708	5.5
Norway	Government Pension Fund – Global (GPFG)	1 472	14.5
Canada	CPP Investments	428	15.7
Australia	Future Fund	148	19.1
Sweden	AP2	49	15.2
New Zealand	New Zealand Superannuation Fund	42	16.6
Norway	Government Pension Fund – Norway (GPFN)	39	12.2
Portugal	Social Security Financial Stabilisation Fund	26	6.5
Sweden	AP6	8	58.3
Chile	Pension Reserve Fund	7	-12.0
Spain	Social Security Reserve Fund	2	0.0
Bulgaria	State Fund for Guaranteeing the Stability of the State Pension System	2	7.9
Total PPRFs		**6 782.7**	**0.2**
Total LPFs and PPRFs		**10 795.9**	

(1) Data correspond to all forms of investment with a value associated with a pension fund/plan.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs and publicly available reports.

LPF and PPRF asset allocation

Figure 3 and Figure 4 show LPF asset allocation grouped by OECD and non-OECD countries. The average portfolio for the LPFs and PPRFs based in the OECD shows that 39.2% of total assets were invested in fixed income, 32.4% in listed equity, 7% in cash and deposits, 6.3% in private equity, 2.4% in unlisted infrastructure investment and 1.9% in hedge funds in 2021.

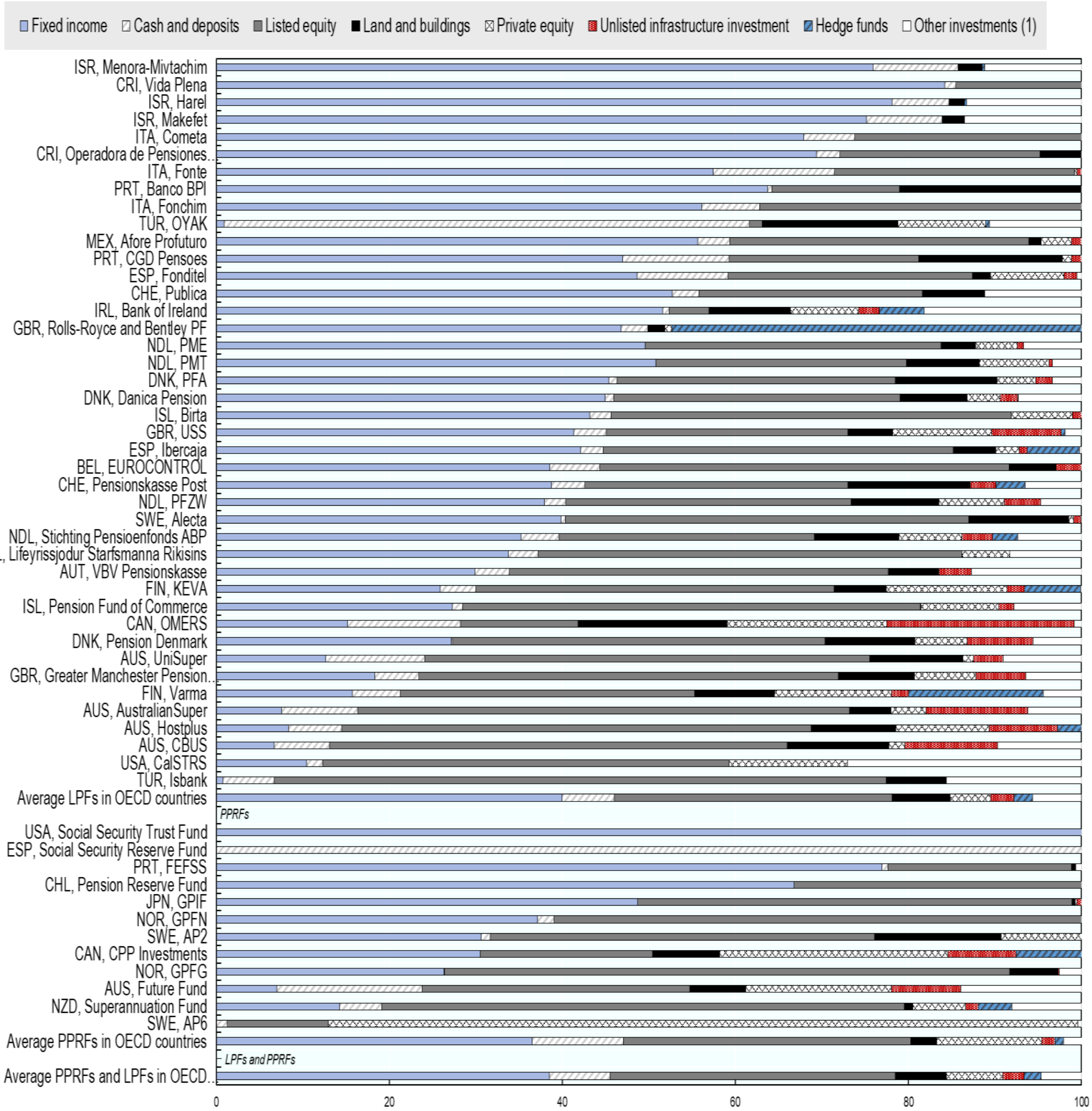
For LPFs and PPRFs in non-OECD countries, the average portfolio held 57.6% in fixed income, 9.3% in cash and deposits, 26.6% in listed equities, 2.1% in land and buildings, 1.6% in private equity, and 0.7% and 0.4% in hedge funds and unlisted infrastructure investments. In non-OECD countries, portfolios were tilted toward safer assets. Two funds based in Brazil, Banesprev and Sistel, invested nearly all assets in fixed income and cash, along with the PPRF State Fund for Guaranteeing the Stability of the State Pension System (SFGSSPS). Funds in Nigeria and India also had high allocations to fixed income and cash.

The difference in average investment in fixed income between OECD and non-OECD countries is large. Non-OECD countries invested on average around 18% more in fixed income, while non-OECD countries invested around 5% less in listed equity. Preliminary findings of the OECD Global Pension Statistics show an average of 6% for cash and deposits, 31.2% for equities and 42.7% for bills and bonds in OECD countries. For non-OECD countries this average is 12.9%, 21.2% and 54.7%

respectively, also indicating a larger tendency of non-OECD countries to invest more in cash and less in equity than OECD countries.[9]

Figure 3. Asset allocation of selected LPFs and PPRFs based in OECD countries, 2021

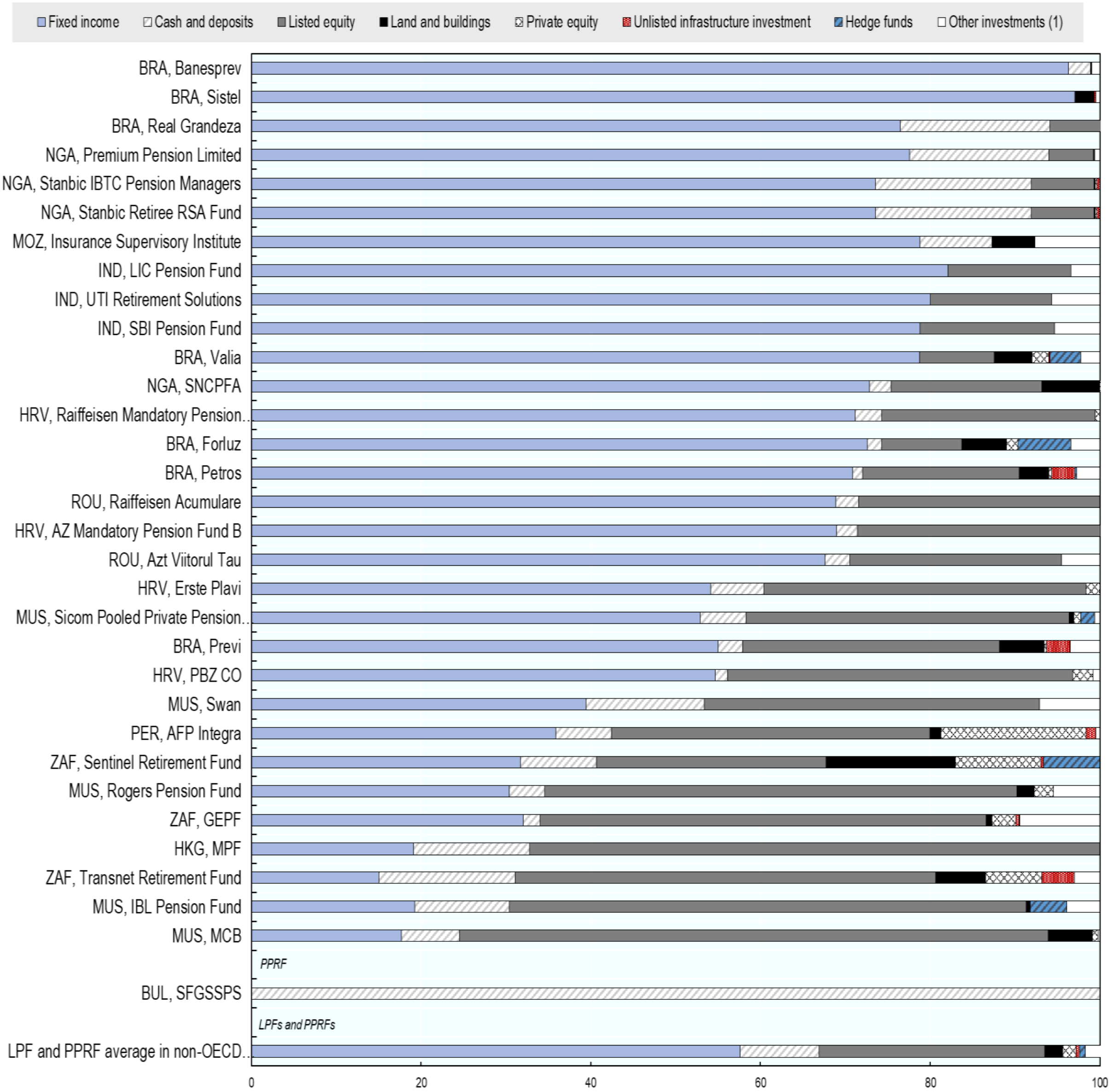
As a percentage of total investment



(1) The “other” category includes loans, commodities, and other investments.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 4. Asset allocation of selected LPFs and PPRFs based in non-OECD countries, 2021

As a percentage of total investment



Note: (1) The "other" category includes loans, commodities, and other investments.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Foreign investment of LPFs and PPRFs

All large pension funds based in the OECD invested at least part of their portfolios in foreign markets, although absolute levels of foreign investment varied largely, between 100% to 0.2% at the lowest (Figure 5). Chile's Pension Reserve Fund (PPRF), Norway's Government Pension Fund – Global (PPRF) and Turkey's OYAK invested their entire portfolio abroad, including in developed and emerging markets.

Funds based in OECD countries invested, on average, 62.4% of their total investments abroad. Of these investments, an average of 46.9% was allocated to listed equity, 29.1% to fixed income, 7.9% to private equity, 6.1% other investments, 3.4% hedge funds, 3.1% land and buildings, 2% to unlisted infrastructure and 1.5% to cash and deposits.

Some funds based in non-OECD countries invested assets abroad, although on average much less (the average fund invested 15.9% in foreign markets) compared to funds in OECD countries. On average, non-OECD countries allocate more of their foreign investments to listed equity and hedge funds and less into unlisted infrastructure than OECD countries. On average foreign investment by non-OECD countries is allocated 60.5% to listed equity, 16% to fixed income, 9.2% hedge funds, 6.7% other investments, 5% private equity, 1.3% to land and buildings, 1.2% cash and deposits and 0.3% to unlisted infrastructure. The Nigerian SNCPFA invested the highest share abroad of non-OECD countries, with 51.7% of its total investments, of which 10% went to North America, 34.1% to Europe and 7.6% to Asia and Asia-Pacific. The Peruvian AFP Integra invested 42% abroad, the Mauritanian Rogers Pension Fund 41.6% and the South African Sentinel Retirement Fund 39%.

The most common asset classes invested abroad were listed equity and fixed income. With regard to OECD countries, the Islandic pension funds Lifeyrissjodur Starfsmanna Rikisins and Pension Fund of Commerce, and the Australian UniSuper invested a substantial amount into listed equities in foreign markets, between 80% and 85% of their foreign investments at the end of 2021. In non-OECD countries, the Mauritian IBL Pension Fund, Sicom and Swan, and the Croatian Erste Plavi invested the highest share of listed equity of total foreign investments, between 85% and 95%.

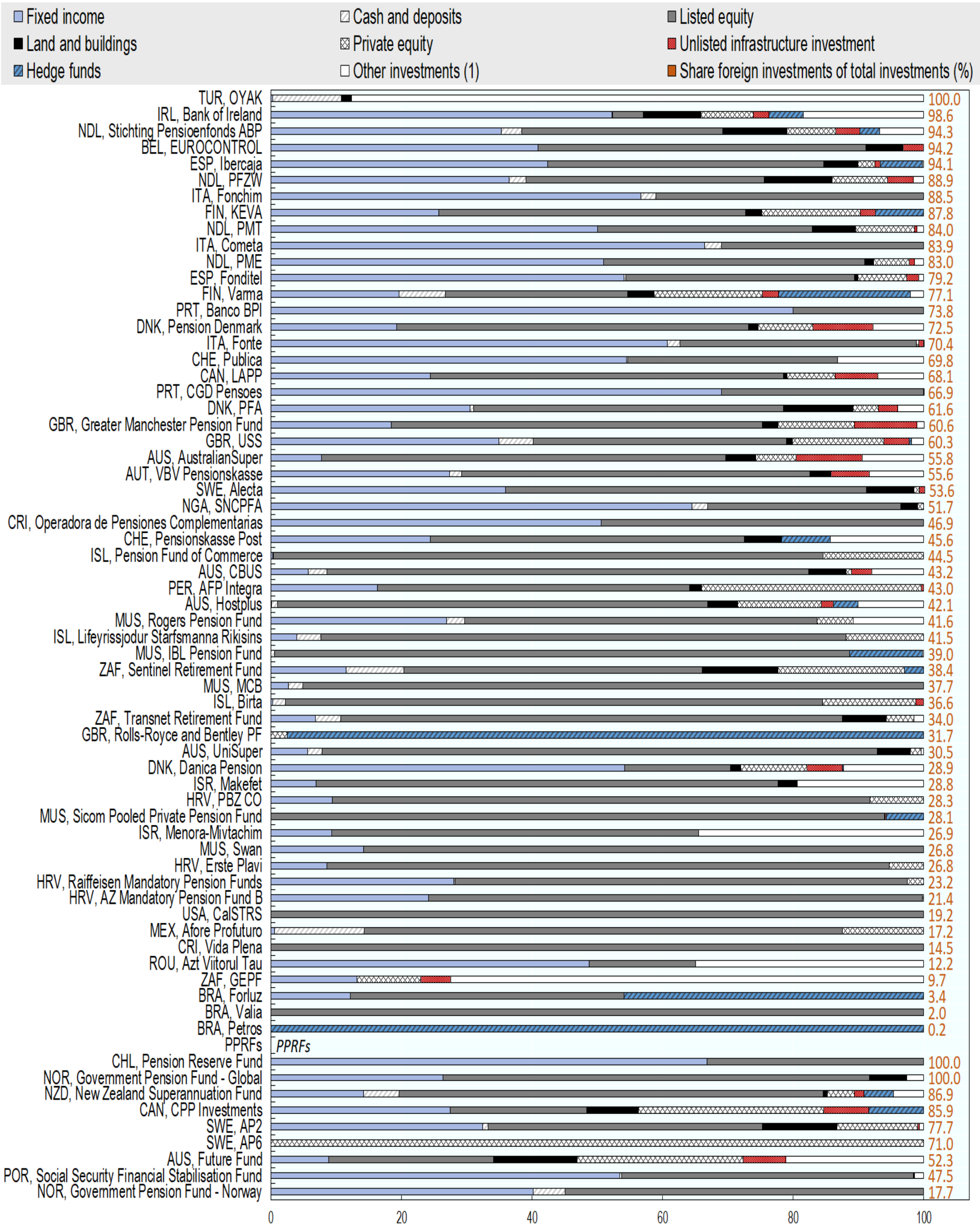
Funds invested large portions of foreign investments in alternative investments, including land and buildings, unlisted infrastructure investment, private equity and hedge funds. CPP Investments (PPRF) invested 51.6% of foreign investments in foreign alternative investments, and had a high allocation to private equity (28.5%) and allocations to hedge funds (8.4%), land and buildings (7.9%) and unlisted infrastructure (6.8%). The Swedish AP6 (PPRF) invested all its foreign investments in private equity. Brazil's Petros (100%) UK's Rolls-Royce and Bentley (97.5) and (45.9%) invested large shares of foreign investments in hedge funds. AustralianSuper, Greater Manchester Pension Fund (United Kingdom) and PensionDanmark (Denmark) invested the highest share in unlisted infrastructure, 10.1%, 9.6% and 9.2% respectively.

On average, of all funds' foreign investments, 47.3% to was allocated to North America, 40% to Europe, 9.6% to Asia and Asia-Pacific, 1.8% to Latin America, 0.9% to Africa and 0.4% to the Middle East (Figure 6). Funds with a diverse portfolio in terms of geography are for instance the Austrian VBV Pensionskasse and the Belgian EUROCONTROL. VBV Pensionskasse invested most in North America and Europe (43.9% and 26.2%), also 21% in Asia, and 4.1% in Latin America and Africa, and 0.7% in the Middle East. The Spanish Ibercaja invested 9.2% in the Middle East, which is the highest share of foreign allocations to this region.

Allocations to emerging countries[10] are crucial for the development of these economies (Figure 7). Emerging market investments are part of the foreign allocations of both LPFs and PPRFs, with emerging markets equities the most common. On average, all funds invested 4.9% of foreign investments in emerging Asia, 1.8% in emerging Europe and 1.4 in emerging Latin America, 1.2% in Africa and 0.3% in the emerging Middle East (Figure 8). The Swedish PPRF AP2 invested the largest share, at 49.2% in emerging markets, of which 33.3% went to emerging Europe, 14.1% to emerging Asia and 1.7% to Africa. The South African Sentinel, the Austrian VBV Pensionskasse and the Australian Hostplus invested 25.4%, 22.3% and 20.4% in emerging economies at the end of 2021.

Figure 5. Foreign investment by asset class, 2021

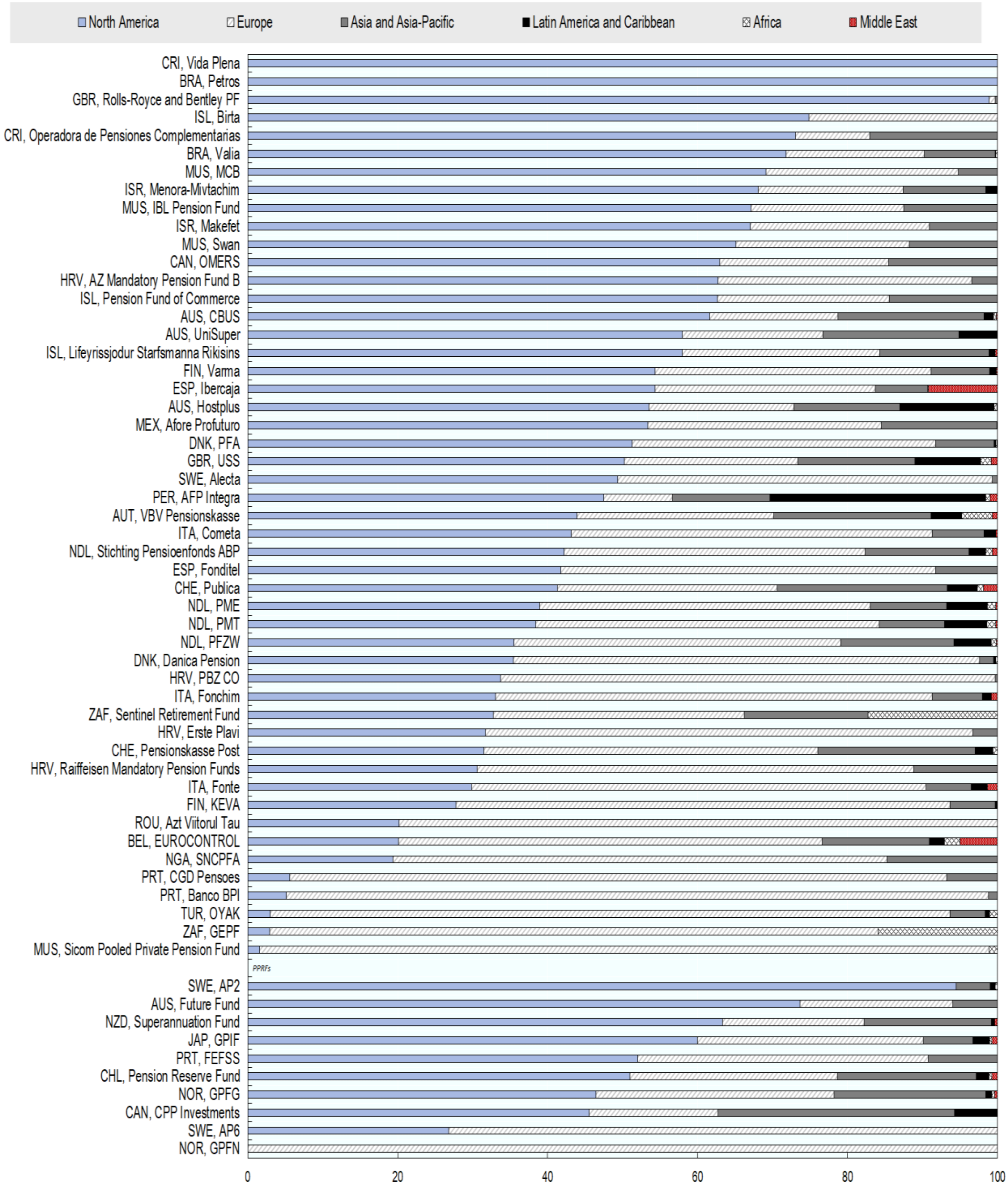
As a percentage of total foreign investment



Note: (1) The “other” category includes loans, commodities, and other investments.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 6. Foreign investment by region, 2021

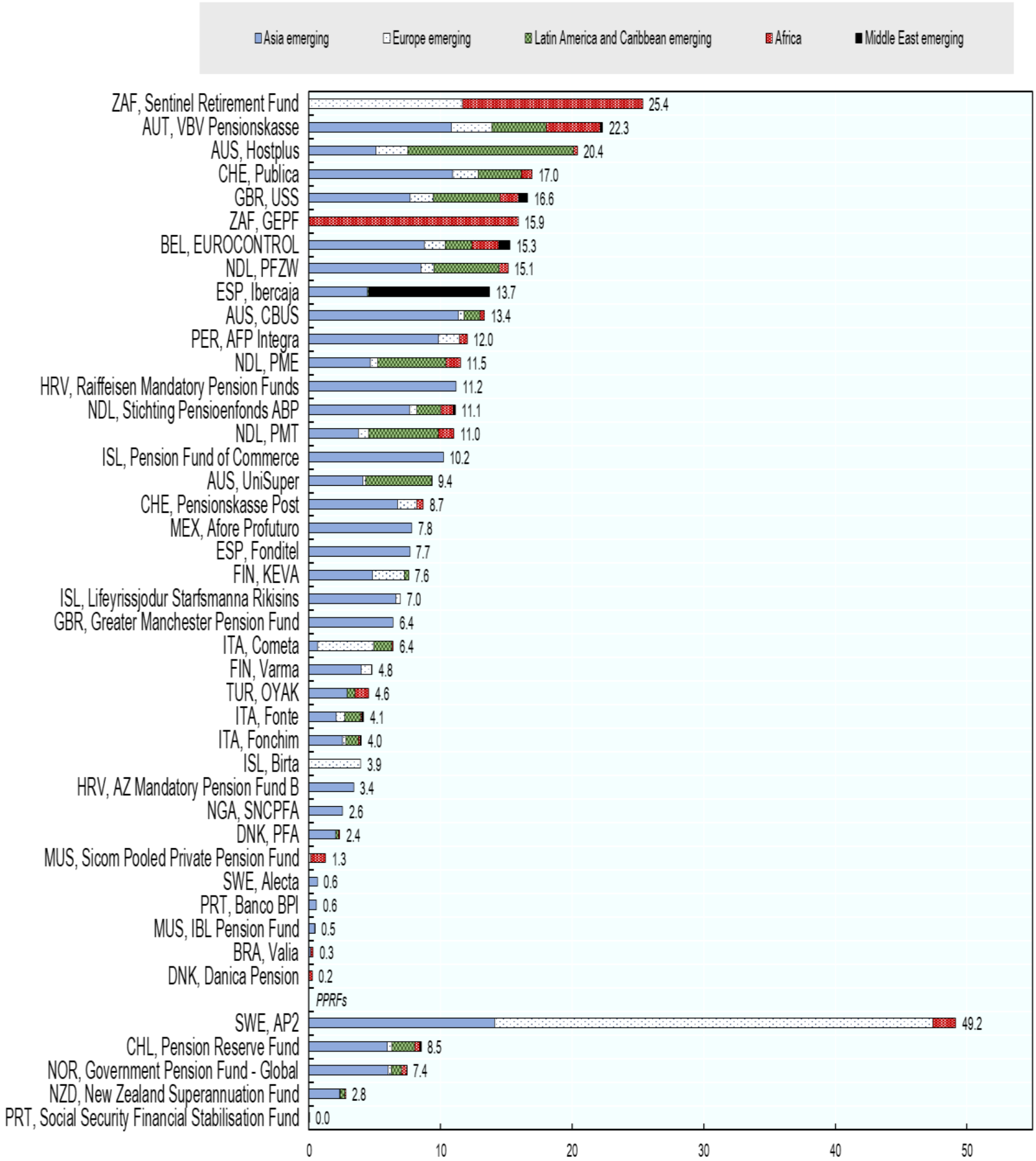
As a percentage of total foreign investment



Note: (1) The “other” category includes loans, commodities, and other investments.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 7. Foreign investment by emerging regions, 2021

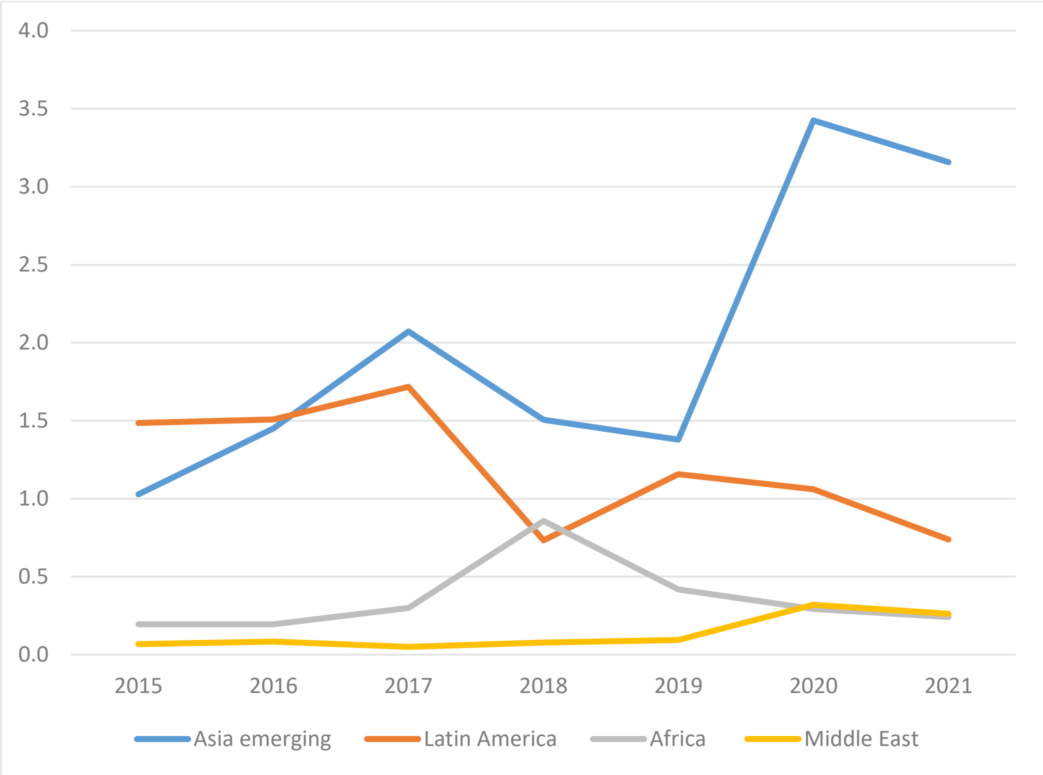
As a percentage of total foreign investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 8. LPFs and PPRFs foreign investments in emerging markets, 2015-21

Average percentage of total investments



Note: Latin America includes all Latin American countries and might also include non-emerging Latin American markets (e.g. Chile). Asia includes all Asia, except for Japan and Korea until 2020. For 2020 and 2021 it only includes Asian emerging markets. Middle East encompasses all Middle Eastern countries and might also include non-emerging Middle Eastern countries.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

2 Infrastructure investment

Overall investment in infrastructure in 2021 was limited relative to the total assets under management of funds from which data was received (i.e. 87 funds for USD 10.6 trillion). Infrastructure investment in the form of unlisted equity, listed equity and debt was USD 211.8 billion, representing 2% of the total assets under management of the entire survey population.

CPP Investments had the largest portfolio of infrastructure unlisted infrastructure equity, listed equity and debt, at USD 38 billion, followed by AustralianSuper at USD 25.2 billion, and OMERS at USD 23.9 billion (Figure 9).

In total, 48 pension funds of the 87 represented in the survey indicated to have a separate allocation for infrastructure investments and for most cases this allocation is indicated as “infrastructure” asset class. Others report infrastructure investments under “alternative investments” (PRT, CGD PENSÕES), “Inflation Sensitive” (USA, CalSTRS), “Equity” (BEL, EUROCONTROL) “private equity” (ISL, LSR; BRA, Petros; BRA, Valia) or “Unlisted investments” (ZAF, GEPF).

Thirteen funds that do not currently invest in infrastructure indicated that they planned to open allocations in the future, including funds based in Croatia, Mauritius, South Africa, Mexico, Brazil and India. A few other funds indicated regulatory or market constraints on investments as barriers. For example, OPCCCSS based in Costa Rica reported that there was limited investable assets in local funds due to regulation. Vida Plena based in Costa Rica and MCB based in Mauritius mentioned few infrastructure investment options as a barrier as these assets are complex to assess.

Of the 53 funds that indicated investment in infrastructure assets, 41 reported exposure to unlisted infrastructure assets. On average, their infrastructure allocation was invested 60.5% in unlisted infrastructure equity, 25.9% in listed infrastructure equity and 13.7% in infrastructure debt (Figure 9). The Canadian fund OMERS and the four superannuation funds based in Australia, AustralianSuper, CBUS, Future Fund and Hostplus all reported high allocations to unlisted infrastructure equity: 21.6%, 11.7%, 10.7%, 8%, 7.9% out of total investments, respectively. USS in the United Kingdom also reported a large allocation to infrastructure at 8.1% of the total portfolio, and PensionDanmark reported 7.6%. Figure 10 shows unlisted infrastructure investments of the 15 largest LPFs and PPRFs from 2016 to 2021, from the top 15 funds in terms of AuM that invested in unlisted infrastructure. Investments of these funds increased from USD 74.4 billion to USD 183.4 billion.

Box 1. Inflation impact on institutional investors and on infrastructure investments

The impact of inflation on the value of the assets held by investors depends on the composition of their portfolios. In general, if investments are not inflation-adjusted by their contractual agreement, high inflation periods will erode the value of yields, decreasing nominal value.

As shown in the Pension Markets in Focus Preliminary Survey 2021 (OECD), inflation hit a 30-year high by December 2021, reaching 6.6% in the OECD area. Therefore, such high inflation rates had a severe impact on pension funds returns in real terms over the period in review. Nonetheless, the investment gains of pension funds in 29 out of 53 countries included in the Pension Markets in Focus were sufficiently high as to offset rising inflation, even though the experienced level of inflation greatly varies across jurisdictions.

Considering longer span inflation dynamics and different national inflation levels in the year 2021, it is notable that the compound effect of inflation over multiple years, as applicable to the case of retirement savings, can lead to considerable losses in returns even for those countries with moderate inflation[1].

In general, a high interest rates environment resulting from an increase of price indices leads to increasing demand towards investment opportunities that are, by their nature, protected against inflation, therefore offering some risk hedging. This is the case of many infrastructures investment projects, whose contractual framework provides a degree of flexibility that permits rate changes where required to hedge investors against interest rate rises and inflation.

According to Blackrock's Inflation & Real Assets Report 2021, real assets outperform traditional asset classes during high inflation environments with many infrastructure assets having an explicit link to inflation through regulations, concession agreements or contracts.

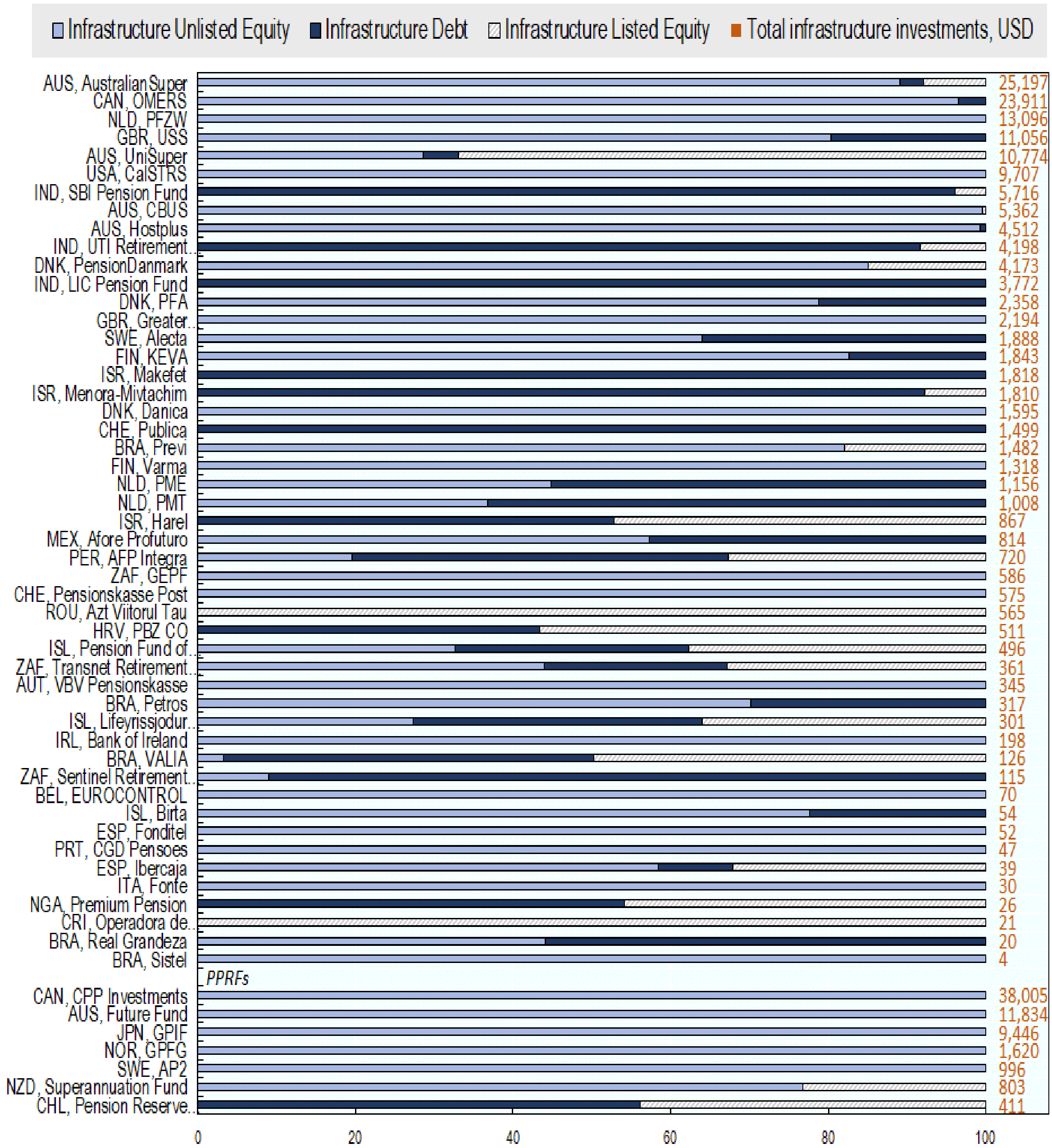
In general, in regulated infrastructure sectors, such as transportation, energy and utilities, there is a high probability that inflation can be passed on to customers through increased tariffs. This is because regulated assets have revenues that are normally determined by a return on an underlying asset base, which is in turn determined by the level of investment. As cost of capital may change in the future, for example because of inflation and rising rates, investors revenues are contractually adjusted to facilitate funding.

Consistently, there seems to be little or no correlation between various European and US infrastructure assets share price to inflation core and headline inflation in the past 30 years[2].

Notes: [1] BETTERFINANCE, 'Long-Term and Pension Savings. The Real Return' (2021).
[2] ClearBridge Investments, Inflation, 'Rising Rates and Their Impact on Infrastructure' (2021).

Figure 9. Infrastructure investment of LPFs and PPRFs, 2021

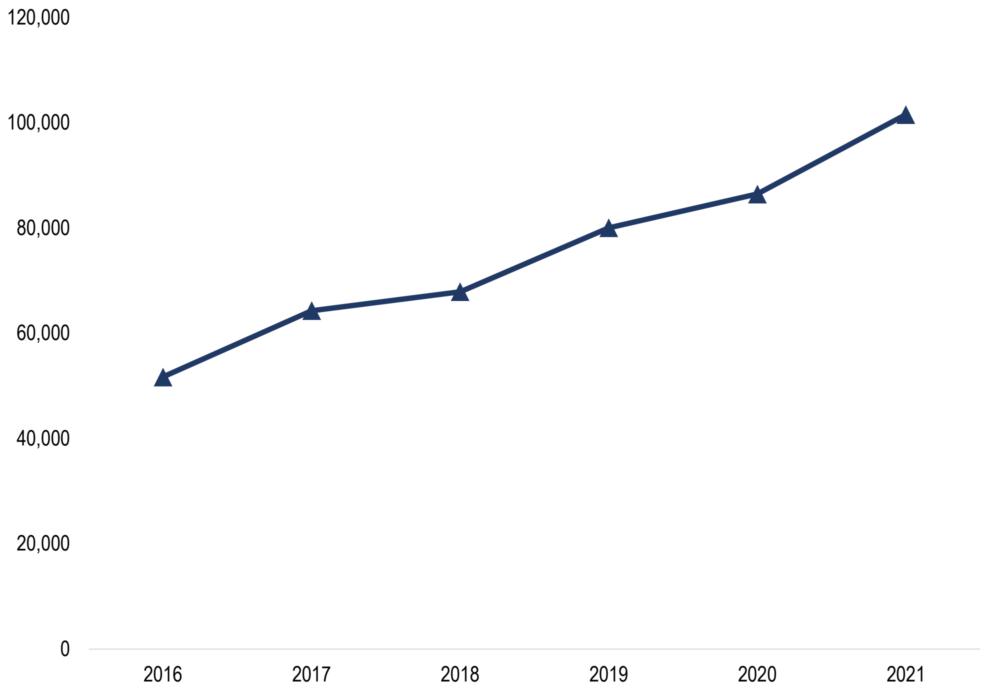
As a percentage of total infrastructure investments



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 10. Unlisted infrastructure investments of top 15 LPFs, 2016-21

Average percentage of total investments of each LPFs



Note: Top 15 largest LPFs and PPRFs with investments in unlisted infrastructure.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Table 2. Infrastructure investment of LPFs and PPRFs in 2021

	Total assets, in USD millions	As a percentage of total infrastructure assets[1]	As a percentage of total assets for all funds[2]
Unlisted Equity	137 531	77.5	3.7
Listed Equity	12 858	7.2	0.3
Debt	27 146	15.3	0.7

Notes: [1] Infrastructure investment is calculated as a percentage of total assets of funds investing in infrastructure.
[2] Infrastructure investment is calculated as a percentage of total assets of all funds in the survey.
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Analysis of infrastructure portfolios

Amongst funds that reported the sector allocations of their unlisted infrastructure equity portfolios, energy was as the largest component, with the average investments being 24.5%, followed by transportation with an average of 22.6%, IT and communication 13%, and renewable energy at 10.2% (Figure 11). Thirteen funds reported information on listed infrastructure equity investments, which is a relatively low number of funds compared to those with unlisted infrastructure equity (Figure 12). Also here energy was the largest component with an average of 16.1%, followed by IT and communications at 12.8%, energy transmission at 11.5 and transport at 11.2%. Some funds indicated to have invested in renewable energy, on average at 7.3%, and the Peruvian AFP Integra indicated to have invested all of its listed infrastructure equity in flood protection and water management. Survey results show widely varying investment levels by pension funds in the various sectors, for unlisted and listed equity.

Results also reveal that pension funds are significant investors in renewable energy. Two funds based in Iceland (Birta and Pension Fund of Commerce), Brazil (Petros and FORLUZ), and in Denmark (PFA and Danica) had investments in renewable energy that occupied 100% of their reported infrastructure allocation. Funds in the Netherlands (ABP), in Canada (AIMCo and LAPP) and Denmark (PensionDanmark) reported sizeable allocations to renewables (USD 3.1 billion; USD 2.1 billion, USD 1.6 billion and USD 1.1 billion (Figure 13).

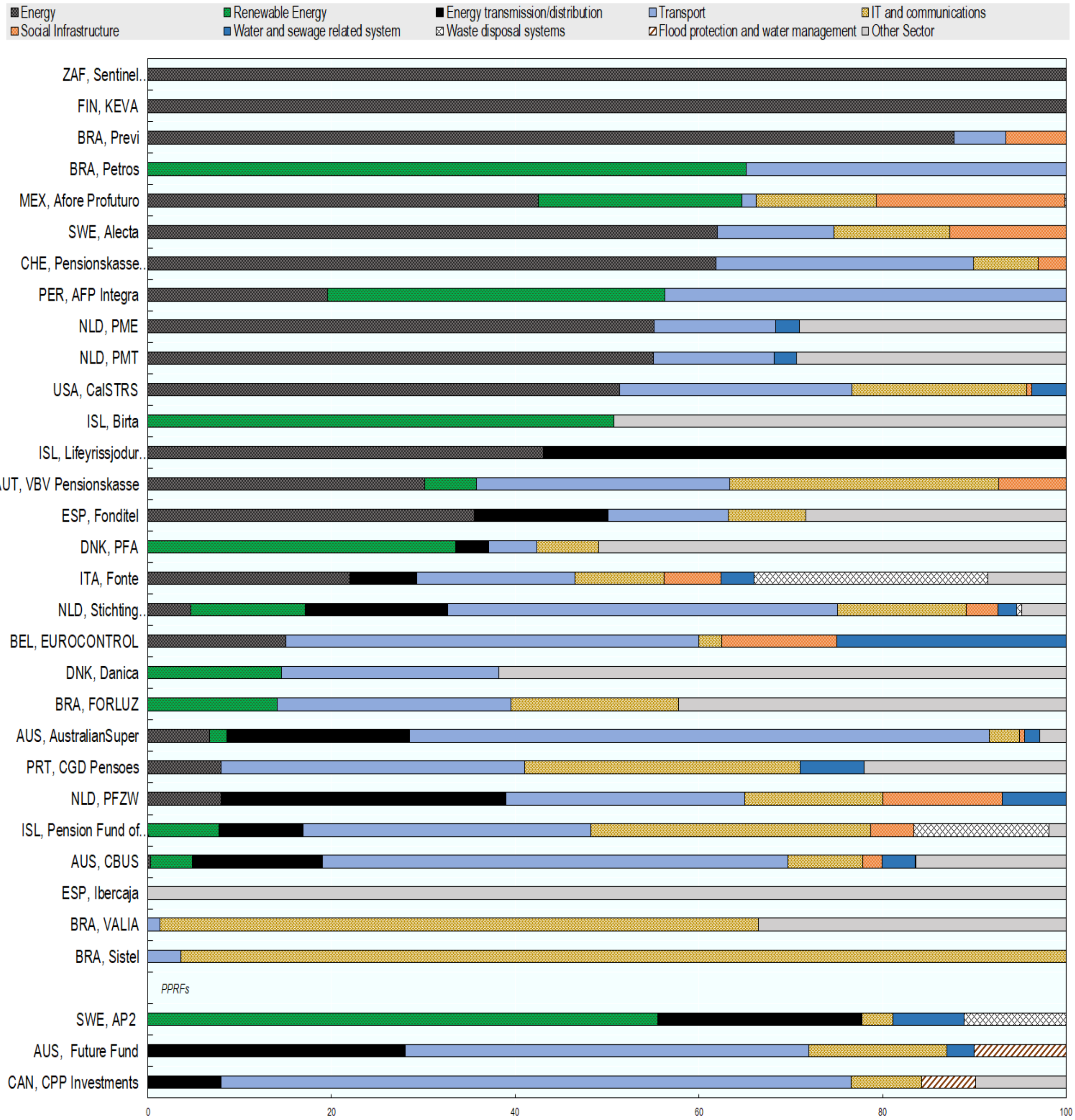
Even though 23 out of 87 pension funds indicated they invest in greenfield projects, only a few funds reported actual existing investment in these assets. Pensionskasse Post, based in Switzerland and Pension Fund of Commerce based in Iceland reported that 9% and 7.8% of their unlisted equity was invested in greenfield assets. It appears from responses that greenfield projects are an area of high interest for pension funds (Figure 14).

Further, with regard to various infrastructure investment vehicles, the majority of funds indicated that they invest in unlisted equity through funds (Table 3). Of the funds that broke out their allocations, unlisted infrastructure funds accounted for 56.2% of the total, direct and co-direct investments 27.5%, and other unlisted investments were 5.3% of the total, on average.

Some funds reported the geographical distribution of their unlisted infrastructure equity portfolio (Figure 15). The sample reveals low levels of investment in emerging markets. The South African GEPF being the only fund reporting exposure in Africa, and only two fund reported exposure to the Middle East, though at de minim levels. CPP Investments, the New Zealand Superannuation Fund, the Canadian LAPP and three funds based in the Netherlands, ABP, PMT and PFZW, reported a relatively large share of infrastructure investment in Asia and Asia-Pacific compared to other funds. CPP Investments and LAPP, based in Canada, reported relatively larger allocations in Latin America compared to other funds. Many pension funds also had a strong home-market bias. Some funds based in Nigeria, South Africa and Australia invested only or had comparatively larger investments domestically than abroad. North America and the European Union were the two regions where most investment were made by the funds.

Figure 11. Infrastructure sector allocations of LPFs and PPRFs in 2021 of unlisted equity

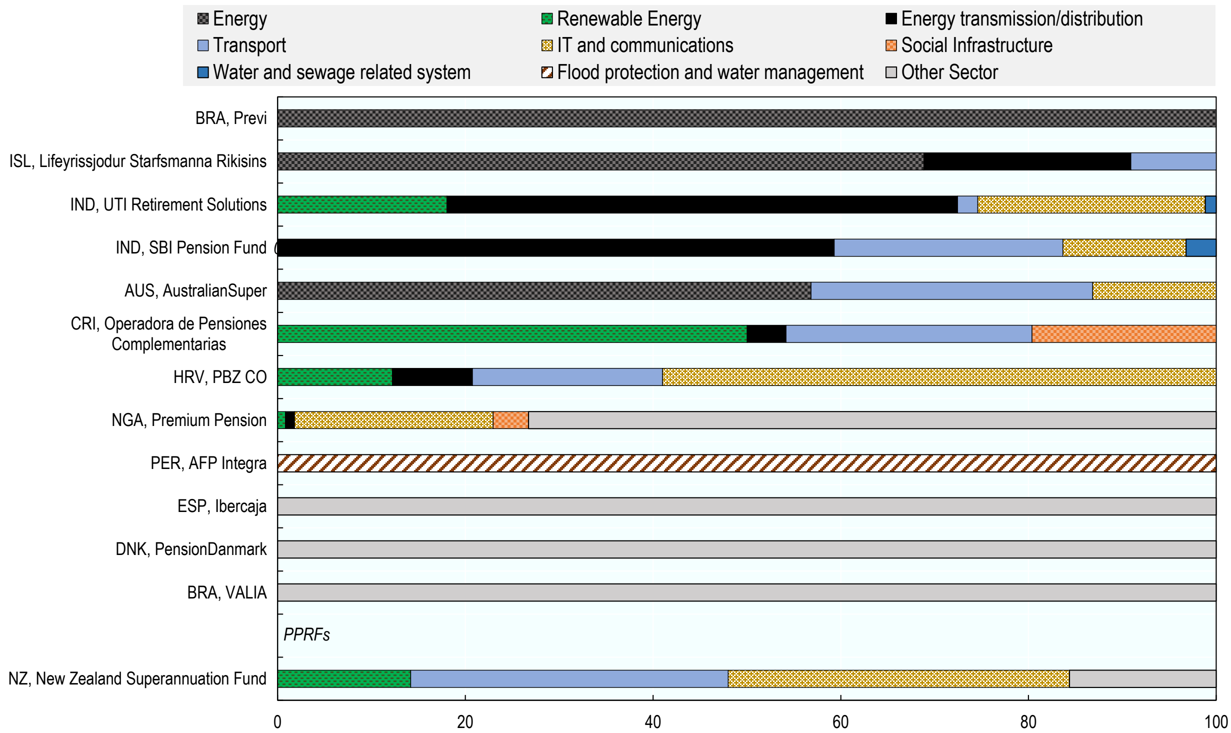
As a percentage of total unlisted infrastructure equity investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 12. Infrastructure sector allocations of LPFs and PPRFs in 2021 of listed equity

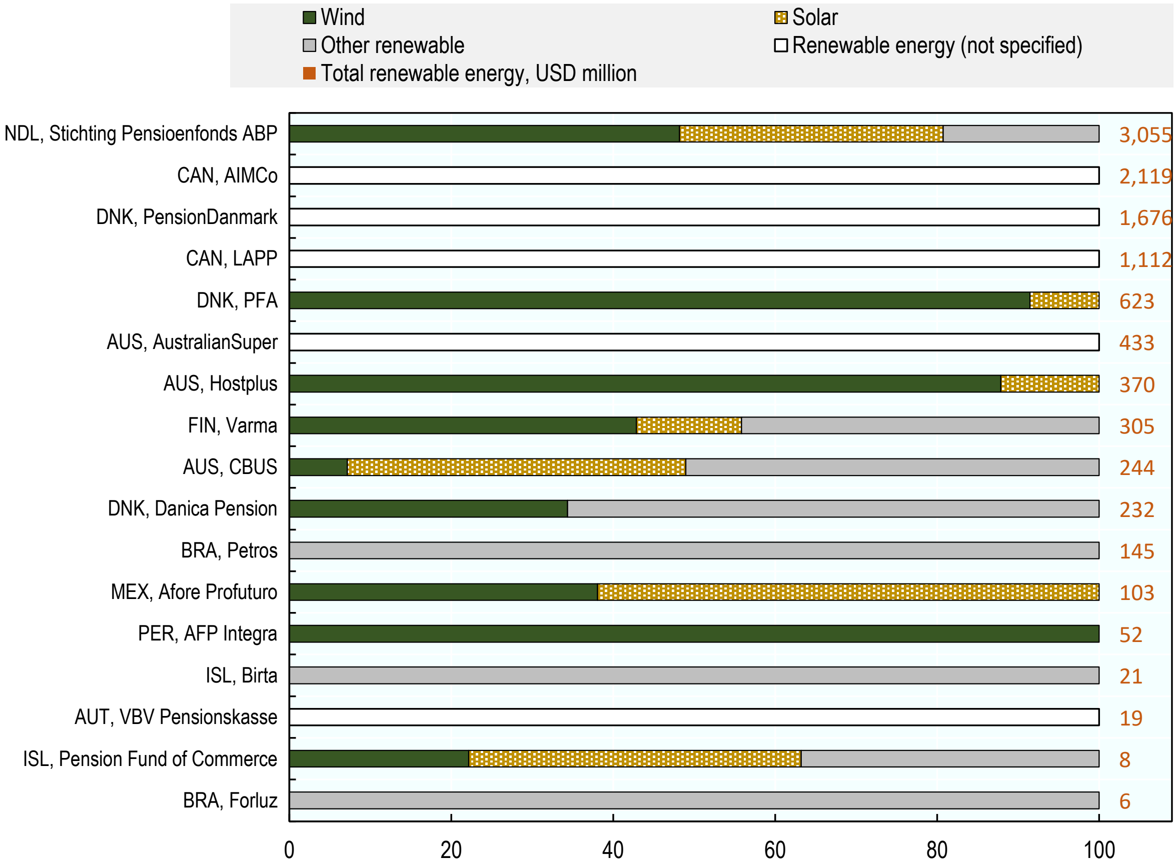
As a percentage of total listed infrastructure equity investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 13. Infrastructure renewable energy allocations of LPFs and PPRFs in 2021

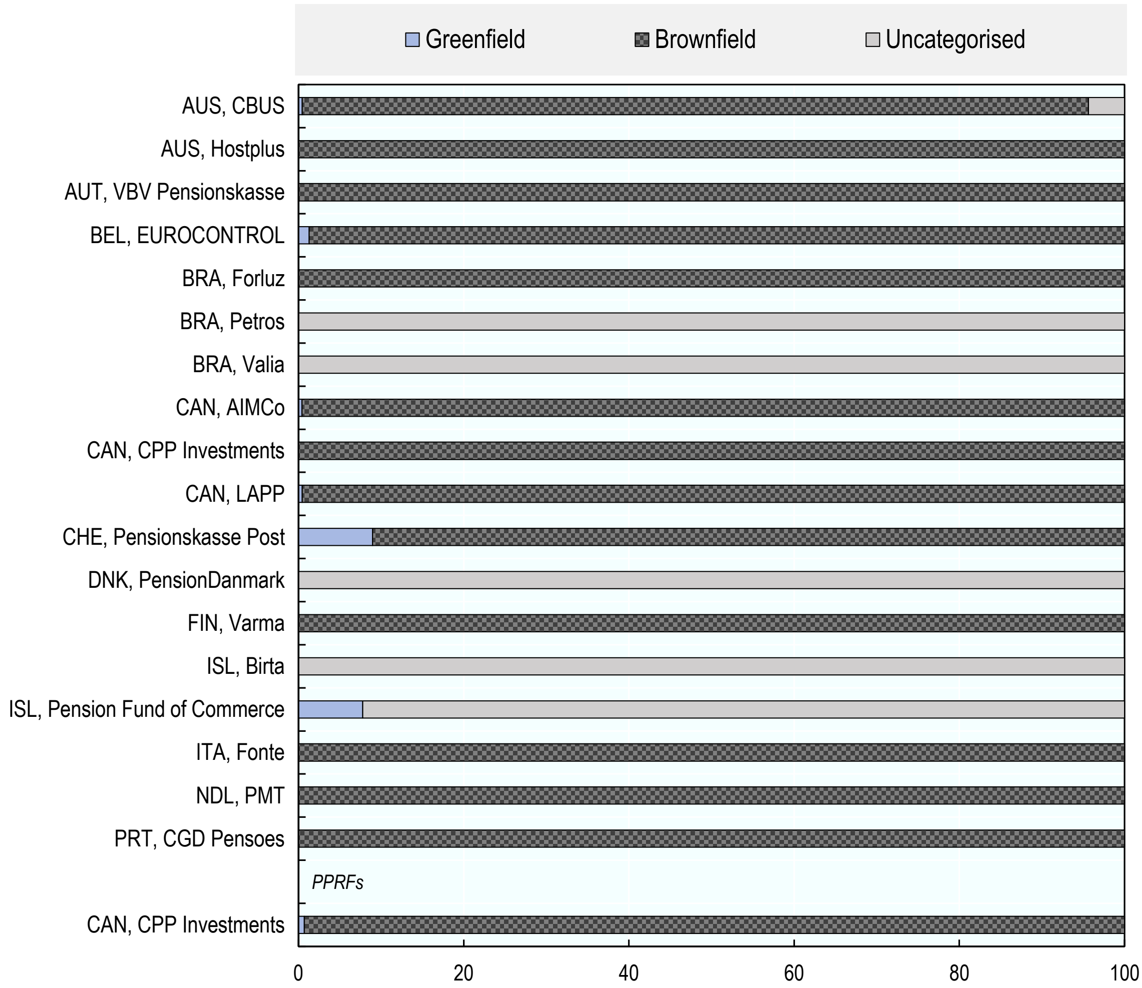
As a percentage of total renewable energy investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 14. Infrastructure allocations, by development phase, for selected LPFs and PPRFs in 2021

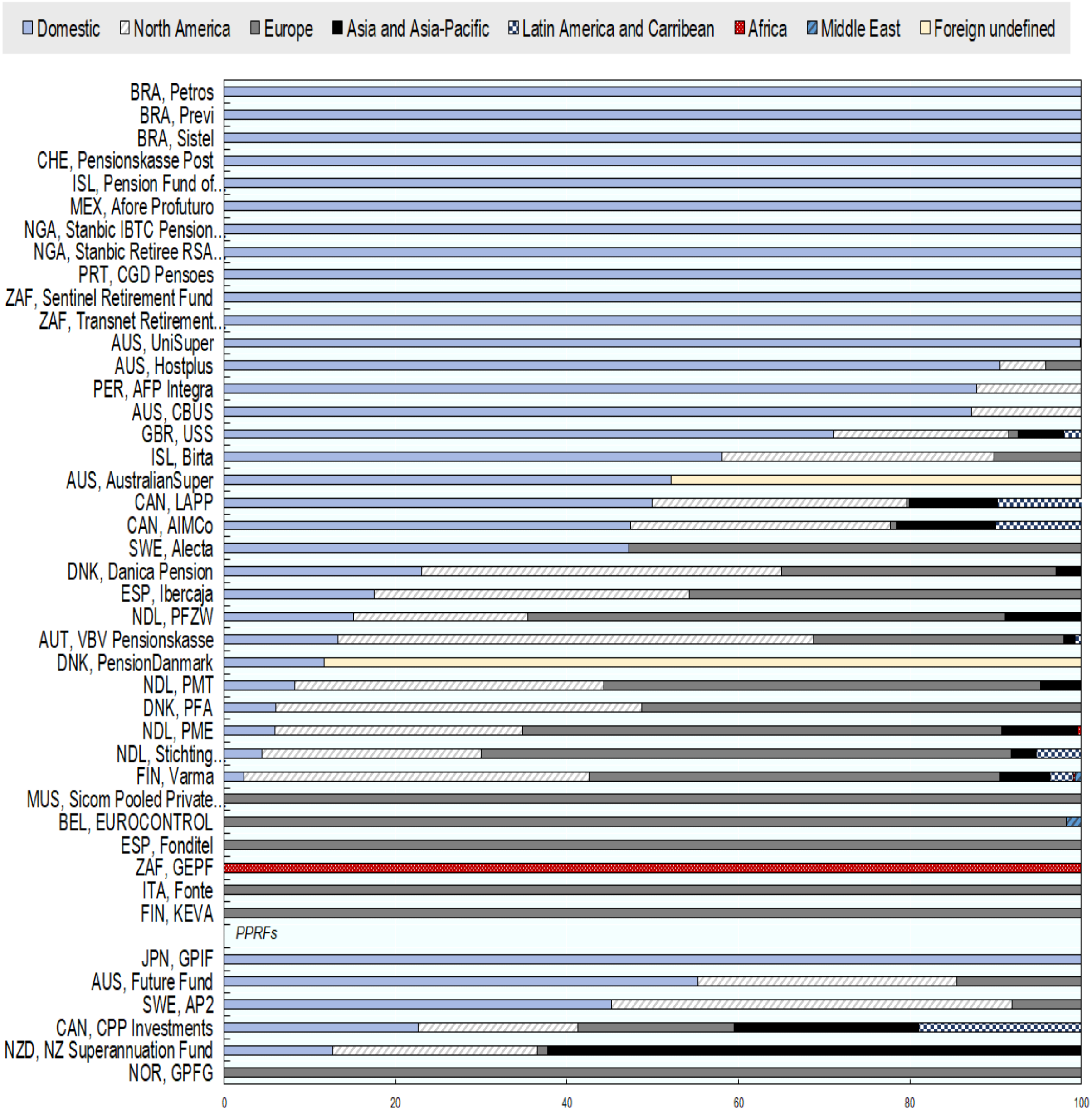
As a percentage of total unlisted infrastructure equity investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Figure 15. Infrastructure allocations, by geographic region, for selected LPFs and PPRFs in 2021

As a percentage of total unlisted infrastructure equity investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Table 3. Detailed infrastructure investment vehicles of LPFs and PPRFs, 2021

As a percentage of total unlisted infrastructure equity investment

Country head office	Name of the fund or institution	Total unlisted infrastructure equity in 2021 (in USD m.)	Unlisted infrastructure investment breakdown (as a percentage of total unlisted infrastructure equity investments) (1)		
			Unlisted infrstructure funds	Direct and co-investment infrastructure equity	Other unlisted infrastructure equity
LPFs					
Australia	AustralianSuper	22 460	48	51	0
Australia	UniSuper	3 084	0	100	0
Australia	CBUS	5 337	76	24	0
Australia	Hostplus	4 476	97	3	0
Austria	VBV Pensionskasse	345	100	0	0
Belgium	EUROCONTROL	70	100	0	0
Brazil	Previ	1 216	0	100	0
Brazil	Petros	223	0	100	0
Brazil	Real Grandeza	9	100	0	0
Brazil	Sistel	4	100	0	0
Brazil	Valia	4	0	0	100
Canada	AIMCo	8 223	10	90	0
Canada	OMERS	23 079	100	0	0
Canada	LAPP	4 317	10	90	0
Denmark	PFA	1 859	52	49	-1
Denmark	Pension Denmark	3 549	100	0	0
Denmark	Danica Pension	1 595	75	23	2
Finland	KEVA	1 523	74	26	0
Finland	Varma	1 318	47	53	0
Iceland	Birta	42	49	51	0
Iceland	Pension Fund of Commerce	162	65	35	0
Iceland	Lifeyrissjodur Starfsmanna Rikisins	82	57	43	0
Ireland	Bank of Ireland	198	100	0	0
Italy	Fonte	30	100	0	0
Mexico	Afore Profuturo	466	0	0	100
Netherlands	PME	518	100	0	0
Netherlands	PFZW	13 096	8	92	0
Netherlands	PMT	370	100	0	0
Netherlands	Stichting Pensioenfonds ABP	24 512	27	73	0
Peru	AFP Integra	141	89	0	11
Portugal	CGD Pensoes	47	100	0	0
South	GEPF	586	100	0	0

Country head office	Name of the fund or institution	Total unlisted infrastructure equity in 2021 (in USD m.)	Unlisted infrastructure investment breakdown (as a percentage of total unlisted infrastructure equity investments) (1)		
			Unlisted infrstructure funds	Direct and co-investment infrastructure equity	Other unlisted infrastructure equity
South	Sentinel Retirement Fund	10	100	0	0
Spain	Fonditel	52	100	0	0
Spain	Ibercaja	23	100	0	0
Sweden	Alecta	1 210	39	61	0
Switzerland	Pensionskasse Post	575	100	0	0
United Kingdom	USS	8 881	6	69	24
United Kingdom	Greater Manchester Pension Fund	2 194	59	41	0
United States	CalSTRS	9 707	37	63	0
PPRFs					
Sweden	AP2	996	50	50	0
Canada	CPP Investments	38 005	0	100	0
Japan	GPIF	9 446	0	0	100
New Zealand	New Zealand Superannuation Fund	616	24	76	0
Norway	Government Pension Fund – Global	1 620	0	100	0

Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

3 ESG and infrastructure

Green investment

A number of funds reported allocations to green investments (Figure 16). Funds based in Sweden, the Netherlands, Austria and Portugal reported sizeable allocations to green equities. Thirty funds reported investments in green bonds. Alecta (Sweden) reported the highest allocation to green bonds, with 4.8% of total investments. Similarly, EUROCONTROL (Belgium) reported 4.1%, and Sentinel (South Africa) and AP2 reported 3.8% and 3.4%, respectively. PFZW (the Netherlands) reported 10% allocated to alternative green asset classes.

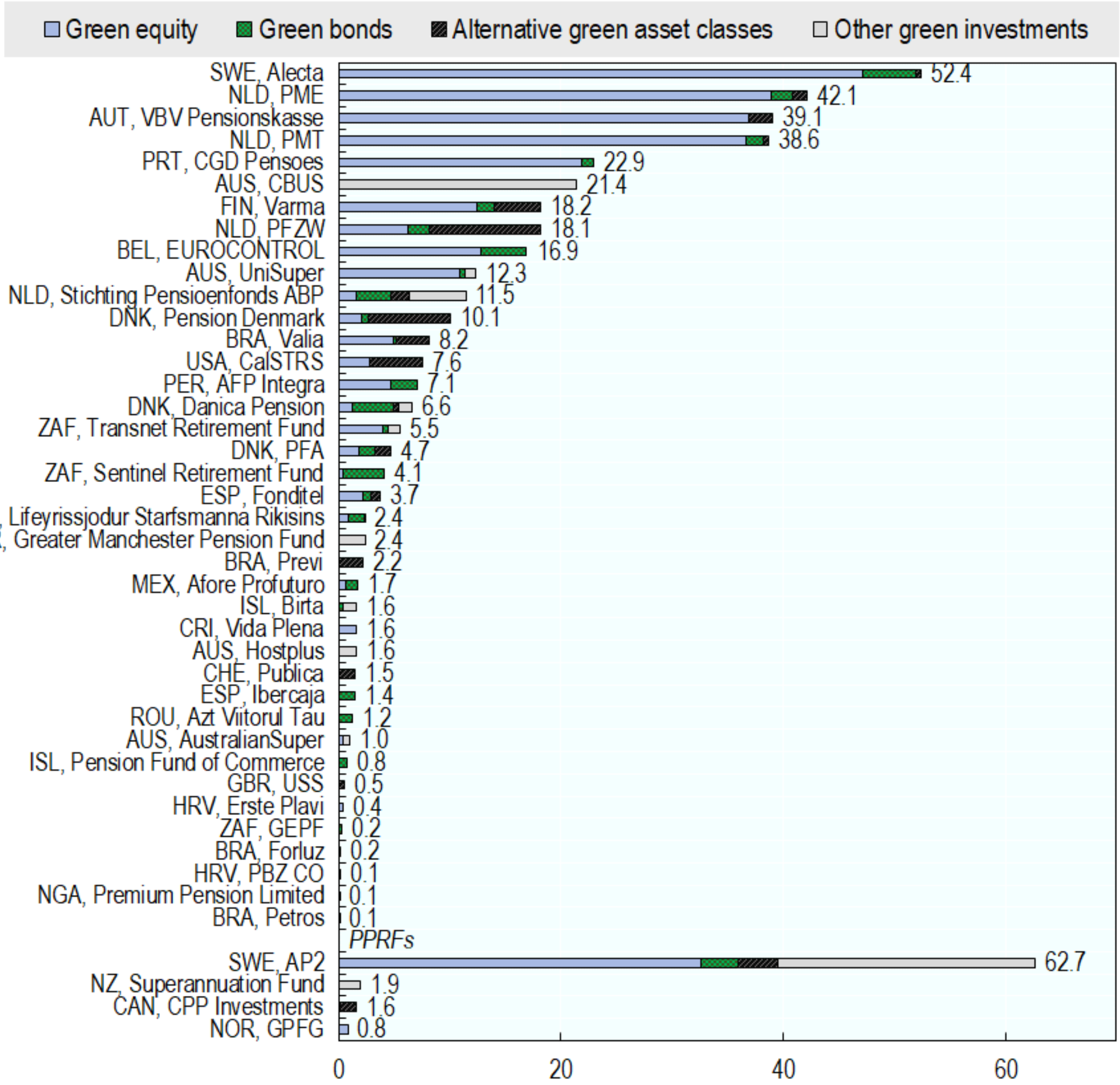
Most funds indicated to not have a specific definition for green investments, but indicate a general description of low carbon and climate resilient investments with a favourable impact on the environment or that generally promote the transition to a sustainable and climate resilient economy. Most of the funds do consider green investments to be part of sustainable, impact or ESG investments and tend to not use a refined definition of green investments.

Other funds have a more detailed description or mention sustainability indices. Most of these funds indicate that their definition aligns with the EU taxonomy, others also mention the Dow Jones Sustainability World Index or ICMA Green Bond Principle. The Canadian AIMCo and LAPP mention that green investments include equity investments in pure play green companies, labelled green bonds and Canadian and US assets with green building certifications. Varma (Finland) mentioned to use an internal taxonomy to classify investments as climate friendly and these assets are part of their cross asset climate allocation. CPP Investments mentioned that its green holdings are public equities using the GICS classification.

Almost no fund indicates to have a specific target allocation for green investments, and these types of investments generally appear under ESG or impact investments. Some indicated that even though they actively invest in green, they not filter these type of investments out of other assets and cannot report a specific number.

Figure 16. Green investments of selected LPFs and PPRFs in 2021

As a percentage of total investments



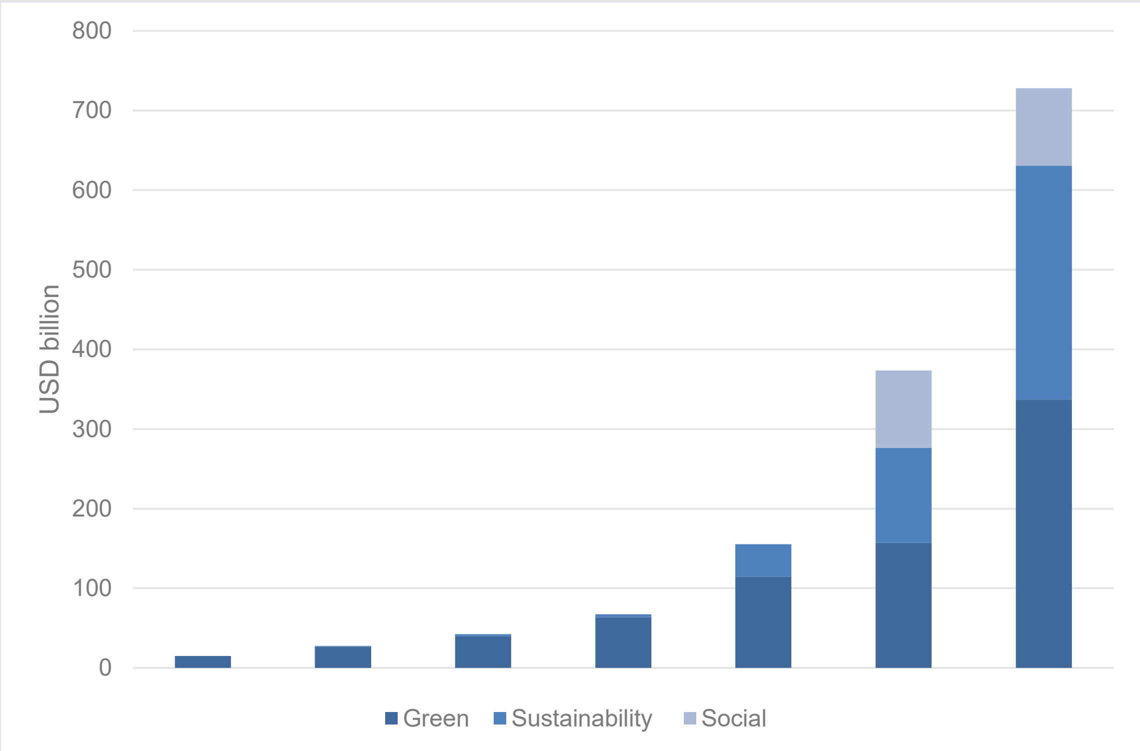
Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Box 2. Global trends in green, social and sustainability bond issuance

The use of green bonds is becoming an important vehicles for investors to contribute to the green transition as well as meeting certain sustainability objectives. As a result, the global volume of green bonds reached USD 336.9 billion in 2021, an increase 63.3% from 2020.

In line with this trend, the issuance of social and sustainability bonds has also started to boom with the sustainability bond issuance reaching USD 293.7 billion and social bond issuance reaching USD 97.1 billion in 2021.

Figure 17. Green, sustainability and social bond issuance



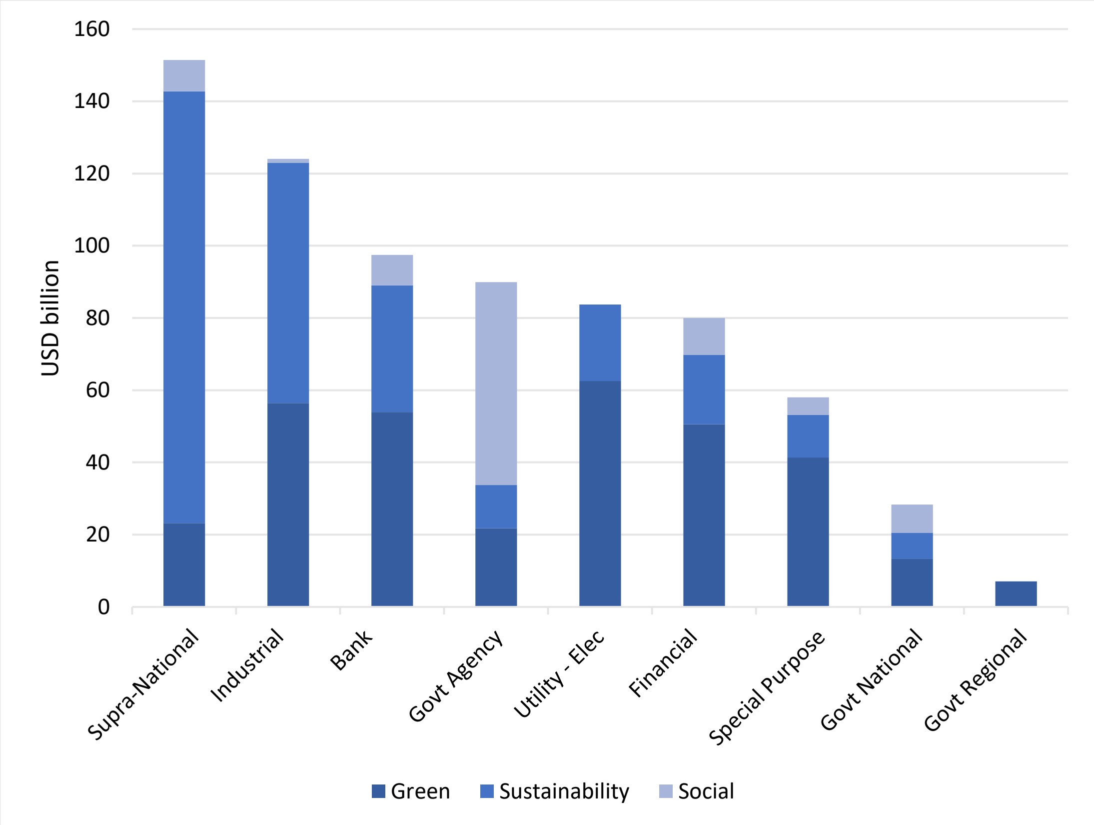
Source: Bloomberg.

Much of the issuance of green bonds is by utility (electric) (USD 62.5 billion), industrial sector (USD 56.4 billion), and banks (USD 53.9 billion). Financials also issue USD 50.5 billion of green bonds, and the popularity of green bonds by sector that represent the infrastructure sector is evident.

However, supra-nationals have the absolute highest issuance in total (USD 151.4 billion), and the highest level of sustainability bond issuance by far (USD 119.5 billion). The industrial sector follows with USD 66.5 billion in sustainability bond issuance.

Interestingly, the highest proportion of social bonds are issued by government agencies at USD 56.1 billion, with the other sectors issuing far less volumes of social bonds. This may reflect the public nature of social bonds.

Figure 18. Issuance by industry of green, sustainability and social bonds



Source: Bloomberg.

Social investment

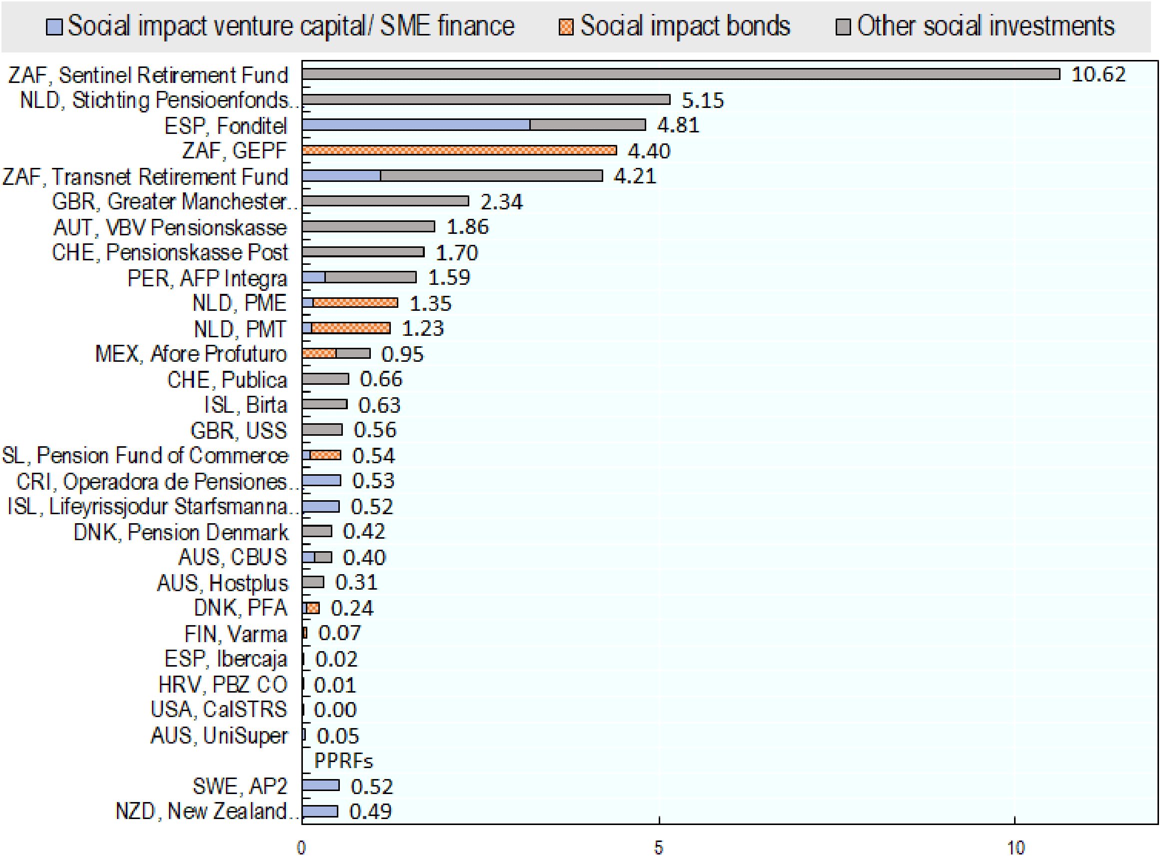
Social impact investments by LPFs and PPRFs are provided in Figure 19, which shows that some funds have committed capital to finance organisations or projects with the explicit expectation of a measurable social, as well as financial return.

Social investments were generally grouped into two primary categories: social impact investments, for instance social impact bonds; and venture capital/SME finance that is specifically targeted to have a demonstrable social benefit, such as local market development. Other social investments funds reported for instance investments are in Australian university campus (Hostplus, Australia), schools and hospitals and medical facilities (Canada, AIMCo), and social housing (VBV Pensionskasse, Austria). GEPF, based in South Africa, has a developmental investment portfolio allocation, which comprises 5% of the overall portfolio and consists of investments in economic and social infrastructure, renewable energy, and agriculture.

To the question of how funds define social investments, most answered to not have a specific definition in place, nor a specific target allocation and that it is allocated along with ESG and sustainability investments. Funds that did provide a definition, outlined along the lines of type of investments that aim to generate beneficial social effects in addition to financial gain.

Figure 19. Social investments of selected LPFs and PPRFs in 2021

As a percentage of total investment



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

ESG investment

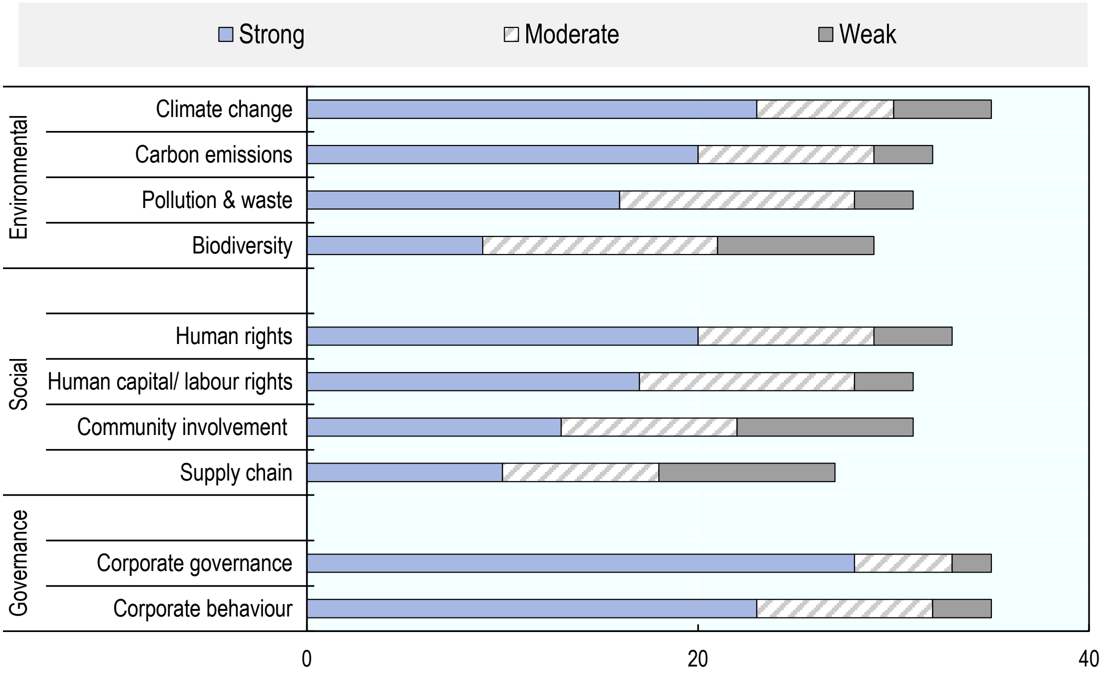
The survey also collected information on ESG investments of pension funds and how various ESG components are considered. Funds ranked their commitment based on a list of ESG aspects from strong to moderate and weak. Results are shown in Figure 20 indicating that most funds reported to consider governance as strong for ESG in infrastructure investments.

Among environmental considerations, impact of climate change is the aspect most taken into account in investments with 23 funds that reported strong commitments, followed by carbon emissions, pollution and waste, and biodiversity being the least considered environmental component.

With regard to the social component of ESG, human rights was the aspect for which most funds reported strong commitment, followed by human capital, community involvement and the supply chain.

Figure 20. ESG aspects considered in investments by LPFs and PPRFs in 2021

Number of total respondents to the survey question



Source: OECD calculations based on responses to the OECD Survey of LPFs and PPRFs.

Box 3. Sustainable infrastructure and sustainable finance: how to reconcile?

It is clear that the application of ESG considerations to infrastructure investments remain fragmented.

To have a better understanding of how G20 Quality Infrastructure Investment Principles are being implemented, 21 sustainable finance and infrastructure initiatives, which are widely recognised and applied in financial and infrastructure context, were mapped in terms of the conditions by which they made requirements.

An examination of the 21 initiatives makes clear that there is some convergence in sustainable finance and infrastructure initiatives. This is particularly the case in relation to 'E' factors, as some of the initiatives are focussed on climate change. However, the initiatives are focussed on climate mitigation and not climate adaptation and resilience which requires greater consideration given the impact that climate change is having on infrastructure assets, in particular in relation to disasters.

Many initiatives only list the areas of considerations, and do not specifically elaborate on how this could be specifically assessed. This means that while the various initiatives cover similar areas, initiatives that provide a more risk-based approach and enabling a more granular understanding are limited in number.

This is also reflected when the assessment of an area is based on a yes/no response which leads to a binary or tick box approach of assessment. While this is helpful in terms of ensuring that the issue is considered, and in some instances having a broader binary response could be preferable to a limited detailed assessment, it may not encourage projects to improve their performance on ESG over time. To bring greater contextualisation, the areas of convergence are listed below avoiding, where possible, binary response assessments.

Table 4. Main areas of assessment of sustainable finance and infrastructure initiatives

	Environmental	Social	Governance
ADB: Investment Principles and Eligibility Criteria (ASEAN Infrastructure Fund)	Greenhous emissions reduction Pollution control Biodiversity and ecosystem conservation	N/A	N/A
Aligned Set of Sustainability Indicators for Infrastructure (ASSI)	Greenhouse emissions reduction Pollution control Biodiversity and ecosystem conservation Waste reduction	Stakeholder engagement Human & labour rights compliance Gender	Anti-corruption Corporate governance and sustainability disclosure
BRE (CEEQUAL)	Greenhouse emissions reduction Pollution control	N/A	N/A
Equator Principles	Greenhouse emissions reduction Pollution control Biodiversity and ecosystem conservation Waste reduction Energy consumption/ efficiency	Stakeholder engagement Human & labour rights compliance Gender	N/A
CBI – Climate Bond Standards	Greenhouse emissions reduction Energy efficiency	N/A	N/A
Climate Policy Initiative (CPI) Global Landscape of Climate Finance	Greenhouse emissions reduction	N/A	N/A
EU Green Taxonomy	Greenhouse emissions reduction Energy and water efficiency	N/A	N/A
GIB (SuRe)	Pollution control Biodiversity and ecosystem conservation Energy and water efficiency	Stakeholder engagement Human & labour rights compliance	Anti-corruption Corporate governance and sustainability disclosure

Green Bond Principles	Greenhouse emissions reduction Pollution control Biodiversity and ecosystem conservation Energy and water efficiency Waste reduction	N/A	N/A
Green Loan Principles	N/A	N/A	N/A
GRESB	Greenhouse emissions reduction Pollution control Waste reduction	Stakeholder engagement Human & labour rights compliance Gender	Anti-corruption Corporate governance and sustainability disclosure
Harmonised MDB Frameworks on Climate Finance Tracking	Energy and water efficiency	N/A	N/A
IDB: Sustainable Infrastructure Framework	Greenhouse emissions reduction Pollution control	Stakeholder engagement Gender	Anti-corruption Corporate governance and sustainability disclosure
IFC Definitions and Metrics for Climate-Related Activities	N/A	N/A	N/A
IFC Environment & Social Performance Standards	Greenhouse emissions reduction Energy and water efficiency	Stakeholder engagement Workforce sustainability	N/A
Infrastructure Sustainability Council of Australia (ISCA)	N/A	N/A	N/A
ISI (Envision)	Greenhouse emissions reduction	N/A	N/A
Social Bond Principles (Relevant Infra Categories)	N/A	N/A	N/A
Sustainability Linked Loan Principles	N/A	N/A	N/A
UN Social and Environmental Standards	Pollution control Biodiversity and ecosystem conservation	Stakeholder engagement Gender	N/A
UNDP SDG Impact Standards for SDG Bonds	N/A	N/A	N/A

Source: ACGF (2020), IDB (2020), BRE (2022), Equator Principles (2020), Climate Bonds Initiative (2020), CLCF (2019), EU Commission (2020), GIB (2022), ICMA (2018), LSTA (2018), GRESB (2022), IDB (2018), IDB (2018), IFC (2017), IFC (2017), Infrastructure Sustainability Council (2022), Institute for Sustainable Infrastructure (2022), ICMA (2021), LSTA (2022), UNDP (2021), UNDP (2022)

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Notes

[1] As noted in the IOPS 'Good Practices in the Risk Management of Alternative Investments by Pension Funds', there is no precise definition of alternative investments. The nature of alternative investments is dynamic and ever-evolving, and closely linked to the development of financial markets. While there is no official definition of alternative assets, the term is usually applied to instruments other than listed equities, bonds, and cash. For the purposes of this survey, "alternative" investments comprise the following types of investments: hedge funds, private equity, real estate, infrastructure, commodities and "other" (other includes: timber and currency/interest rate overlays).

[2] For example, infrastructure investment may not occupy a separate allocation, appearing instead as part of private equity or real estate allocations. Pension fund investment in listed infrastructure vehicles is reported by national statistics agencies as national or foreign equities and infrastructure lending is reported as fixed income, while direct investment or participation in private equity vehicles is sometimes reported within the category "other".

[3] The survey does not utilise a strict definition of a large pension fund, but seeks to capture trends by looking at the largest investors in the world, compared on an absolute basis, followed by the largest investors within specific countries.

[4] See OECD Global Pension Statistics, www.oecd.org/ pensions/globalpensionstatistics.htm.

[5] PPRFs are reserves/buffers to support otherwise PAYG financed public pension systems as opposed to pension funds which support funded pension plans in both public and private sectors. See Annex for definitions of the types of sovereign and public pension reserve funds. The survey included some SWFs such as Norway's Government Pension Fund – Global that have at least a partial pension objective.

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[10] The term "emerging" refers to developing countries as defined by the Development Assistance Committee's (DAC) list of Official Development Assistance (ODA) recipients. It includes all low- and middle-income countries (as defined by the World Bank, based on gross national income [GNI] per capita), except for those that are members of the G8 or the European Union (including countries with a firm accession date for EU membership), see http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/daclist.htm.

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