

# De-risking Institutional Investment in Green Infrastructure: 2021 PROGRESS UPDATE

POLICY PERSPECTIVES

OECD ENVIRONMENT POLICY PAPER NO. 28



-07.55	08.945	43.25	-07.55	21.282	8.45	08.45	08.945	-07.55
-55.76	51.125	08.95	-55.76	43.125	1.25	51.25	51.125	-55.76
-22.10	37.591	20.51	-22.10	05.251	7.91	37.91	37.591	-22.10
-18.07	05.251	56.72	-18.07	51.125	5.51	05.25	05.251	-18.07
-05.11								-05.11
-82.56								-82.56
-76.16								-76.16
-02.21								-02.21
-07.86								-07.86
-99.58								-99.58
-35.21								-35.21
-19.56								-19.56
-20.25								-20.25
-07.14								-07.14
-18.10								-18.10

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Authorised for publication by Rodolfo Lacy, Director, Environment Directorate

08.945	08.945	8.45	43.25
51.125	51.125	1.25	08.95
37.591	37.591	7.91	20.51
05.251	05.251	5.51	56.72
62.112	62.112	2.12	18.09
56.782	56.782	6.82	07.14
43.125	43.125	4.25	19.56
93.175	50.366	0.66	15.51
19.256	19.256	9.56	93.74
85.778	85.778	8.78	78.06
07.141			
37.591			
43.125			
05.227			
50.366			

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# De-risking institutional investment in green infrastructure: 2021 Progress Update

Quality infrastructure is central to sustainable socio-economic development. Despite its critical importance, however, infrastructure globally suffers from an investment gap of USD 2.5-3 trillion per annum (OECD, The World Bank, UN Environment, 2018<sub>[1]</sub>). Even before the health crisis, there was broad consensus that this deficit cannot be tackled by the public sector alone. The pandemic has only made the need to mobilise private capital more urgent. This Progress Update discusses how public financial institutions are actively using de-risking and other interventions to mobilise private capital with a focus on green infrastructure.

Much attention has been paid to institutional investors as an important source of private infrastructure investment. Latest OECD analysis estimates current infrastructure holdings by pension funds and insurers (domiciled in OECD and G20 countries) at 4.1% of their investable AUM (USD 11.4 trillion)<sup>1</sup> (OECD, 2020<sub>[2]</sub>). This suggests large scope to increase institutional capital flows towards infrastructure development.

Though rising public debt and competing fiscal priorities continue to constrain public budgets, infrastructure spending will be a critical component of the post-pandemic economic recovery. In response to the COVID-19 pandemic, the OECD and initiatives like the Coalition of Finance Ministers for Climate Action (CFMCA) have marshalled global consensus around ‘building back better’, placing renewed emphasis on green infrastructure (see Box 1). Presently, however, no more than 30% of global institutional infrastructure holdings (USD 1.04 trillion) may be categorised as green (OECD, 2020<sub>[2]</sub>).

Recent surveys of institutional investors suggest rising appetite for infrastructure opportunities (KPMG, AIMA, 2020<sub>[3]</sub>). The pandemic has further galvanised support for green investing and ‘climate-proofing’ institutional portfolios through taking climate-related risks into account (OECD, 2020<sub>[4]</sub>). Governments and other public actors can leverage this trend to channel greater private investment towards critical infrastructure.

Catalysing private investment requires an enabling policy framework. The design of policies around infrastructure planning and procurement, investment, competition, and financial markets are fundamental to inspiring market confidence and attracting investment (OECD, 2020<sub>[2]</sub>, OECD, 2018<sub>[5]</sub>, OECD, 2015<sub>[6]</sub>). However, governments may in addition have to deploy supplementary risk mitigating solutions to facilitate certain transactions and foster new markets.

De-risking instruments and transaction enablers deployed by national and sub-national governments, domestic and international public finance institutions, and other public actors at the project level can facilitate institutional investment in green infrastructure. This policy paper provides an overview over the use of these instrument by public actors in G20 countries.<sup>2</sup> The paper expands the typology of de-risking instruments of Röttgers, Tandon and Kaminker (2018<sub>[7]</sub>) and updates the data collection and analysis of Röttgers, Tandon and Kaminker (2018<sub>[7]</sub>) and Kaminker (2016<sub>[8]</sub>) as well. This update extends the dataset from 152 (in 2018) to 328 projects, relying on the methodology detailed in Röttgers, Tandon and Kaminker (2018<sub>[7]</sub>). Tables 1 and 2 present a typology of de-risking instruments and transaction enablers that have already been deployed by public actors to mobilise institutional investment.

1 Maximum assets under management (AUM) that can be allocated to unlisted infrastructure under quantitative limits on investment prescribed by pension and insurance regulation in OECD and G20 countries.  
 2 Including single EU countries.

## BOX 1

**Greening the post-pandemic recovery—the role of green infrastructure**

Governments have formulated green recovery packages as responses to the economic crisis caused by COVID-19. Many measures in these green recovery packages have an infrastructure aspect or relate to environmental objectives. Notable measures affecting investment in green infrastructure often relate to energy and ground infrastructure. Projects in these sectors are often “shovel-ready” and relatively straight-forward to include in recovery packages. However, there is currently no reason to consider these measures sufficient to drive the needed transformation, or that they are particularly suited to mobilise institutional investment in infrastructure.

Source: OECD (2021, forthcoming), Green Recovery: Database of recovery measures with environmental implications.

## BOX 2

**Blended finance and de-risking instruments**

Blended finance is the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries. Blended finance typically involves the use of de-risking instruments, but is not one itself. Note that this view of blended finance and not listing use of blended finance itself under de-risking instruments is a departure from Röttgers, Tandon, Kaminker (2018<sub>[7]</sub>).

Source: OECD (2021, forthcoming), Green Recovery: Database of recovery measures with environmental implications.

## Typology of de-risking instruments

De-risking Instruments		
NAME	DESCRIPTION	FREQUENCY IN DATABASE
<b>Co-investment (Project Equity)</b>	Public actor(s) provide equity alongside private investor(s) directly at the project level. Equity stake of public actor(s) may be equal or lower than that of private investor(s).	14
<b>Co-investment (Equity Fund)</b>	Public actor(s) co-capitalise an unlisted fund alongside private investor(s) (as a limited partner). The fund provides equity to projects.	174
<b>Co-investment (Debt Fund)</b>	Public actor(s) co-capitalise an unlisted fund alongside private investor(s) (as a limited partner). The fund extends debt to projects.	3
<b>Co-financing</b>	Debt provision by a public actor(s) alongside other private financiers, directly at the project level.	12
<b>Cornerstone stake (Fund Level)</b>	Investment by a public actor in a fund, amounting to a majority equity stake so as to achieve a demonstration effect and attract other investors.	55
<b>Subordinated equity (Fund Level)</b>	Mezzanine or junior financing provided by a public actor to a fund with the purpose of minimising potential losses to private investors.	2
<b>Subordinated debt</b>	Junior debt provision by a public actor.	4
<b>Anchor investment in CDOs</b>	Investment by a public actor(s) in a collateralised debt obligation (CDO) or a collateralised loan obligation (CLO) amounting to a majority stake in a securitised loan or other debt extended to infrastructure projects.	7
<b>Loan</b>	Debt issuance by a public actor.	63
<b>Loan guarantee</b>	Guarantee by a public actor to pay any amount (either in full or part) due on a loan in the event of non-payment by the borrower.	17

*De-risking instruments involve either a direct use of public money or backing a project with public funds, both of which put public funds at risk. The distinguishing feature of de-risking instruments is an assumption of contingent liability by public funds.*

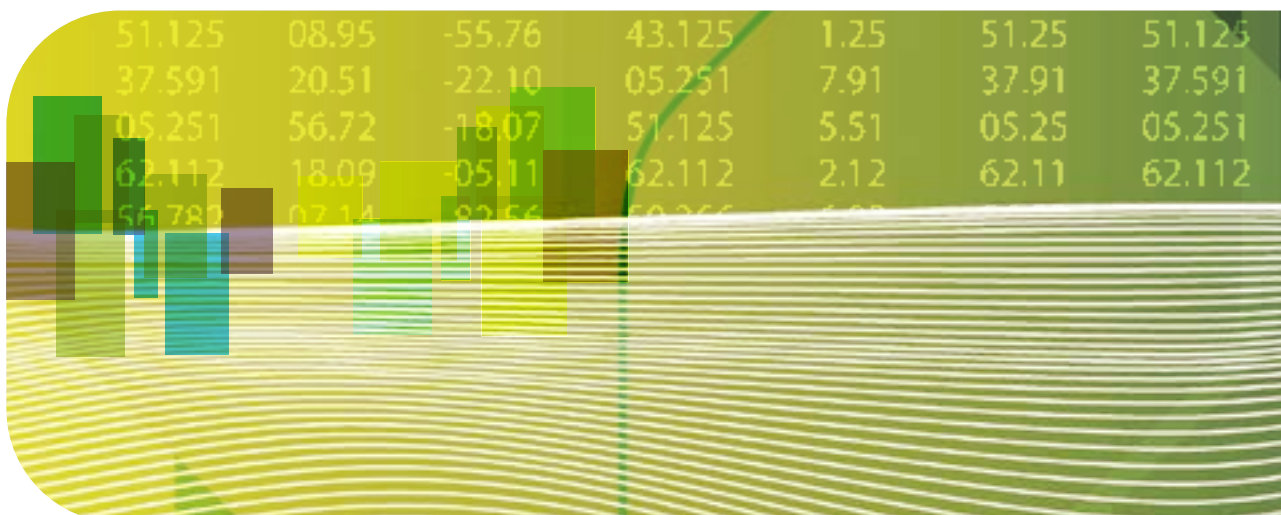
## EXAMPLE

PROJECT	PUBLIC ACTOR(S) INVOLVED	INSTITUTIONAL INVESTOR
Richmond-Airport-Vancouver Rapid Transit PPP	Government of Canada, Province of British Columbia, Greater Vancouver Transportation Authority, Vancouver Airport Authority	British Columbia Investment Management Corporation (BCIM), Caisse de dépôt et placement du Québec (CDPQ)
Saint Fraigne Wind Farm	European Investment Bank (EIB)	Institutional investors through Omnes Capital.
CRONIMET PV Plant	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), KfW Entwicklungsbank, Ministry of Foreign Affairs of Denmark, UK Department of Energy and Climate	Institutional investors through the Global Climate Partnership Fund
Rock Wind Holdings - 75MW Highland North Wind Farm (Pennsylvania)	NY Green Bank	Institutional investors through BlackRock Global Renewable Power Fund II
Kathu Concentrated Solar Power Project	Development Bank of Southern Africa (DBSA)	Government Employees Pension Fund (GPIC)
Balenahalli 38 MW wind project	European Commission, Netherlands Development Finance Company (FMO), USAID, Swedfund, Atradius Dutch State Business	Institutional investors through Climate Investor 1 Fund
Cookhouse Wind Farm	Industrial Development Corporation of South Africa	Institutional investors through the following funds: IDEAS Managed Fund, African Infrastructure Investment Fund (AIIF) II (SA); African Infrastructure Investment Fund (AIIF) II (MAU); Globeleq, AFPOC, African Infrastructure Investment Managers (AIIM)
NAB Low Carbon Shared Portfolio Project 1	Clean Energy Finance Corporation (CEFC) Australia	Insurance Australia Group Ltd., undisclosed institutional investors
Veja Matte Offshore Wind Farm	KfW, Bayerische Landesbank, Landesbank Hessen-Thüringen Girozentrale	PensionDanmark A/S and other undisclosed institutional investors through Copenhagen Infrastructure II
Walney Island Offshore Wind Farm Extension Phase II	EKF	PensionDanmark A/S, Pensionskassernes Administration A/S, Legal & General Group PLC Pension Insurance Corp, undisclosed institutional investors through asset management companies

# Table 1

De-risking Instruments		
NAME	DESCRIPTION	FREQUENCY IN DATABASE
Shareholder loan	Loan provided by a public actor while an existing shareholder.	1
Public seed capital or grants	Concessional fund allocation using public money	6
Revenue guarantee	Guarantee by a public actor to pay for the core product to ensure revenue cash flow for a project.	22
Back-stop guarantee	Guarantee by a public actor to purchase any unsubscribed portion of an issue (debt or equity)	3
Credit Facility	A rolling line of credit extended by a public actor.	6
Liquidity facility	A facility by a public actor allowing the borrower to draw thereupon in case of a cash flow shortfall.	1
Investment insurance	Guarantee by a public actor to indemnify in case of investment losses.	4
Political risk insurance	Guarantee by a public actor to indemnify in case of political risks like currency inconvertibility, expropriation etc.	3
Tax Credit	Offsets to lower taxable income provide by government as incentive to invest in infrastructure.	1

**Note:** This 2021 progress update expands the typology in Röttgers, Tandon and (Kaminker, 2018<sub>19</sub>) (table 3.1 there). Co-investment and cornerstone stake have been refined and further split by project/fund level and equity/debt. The dataset does not currently record any observations involving cornerstone stakes at the project level. Therefore this category is not reflected in the table above.

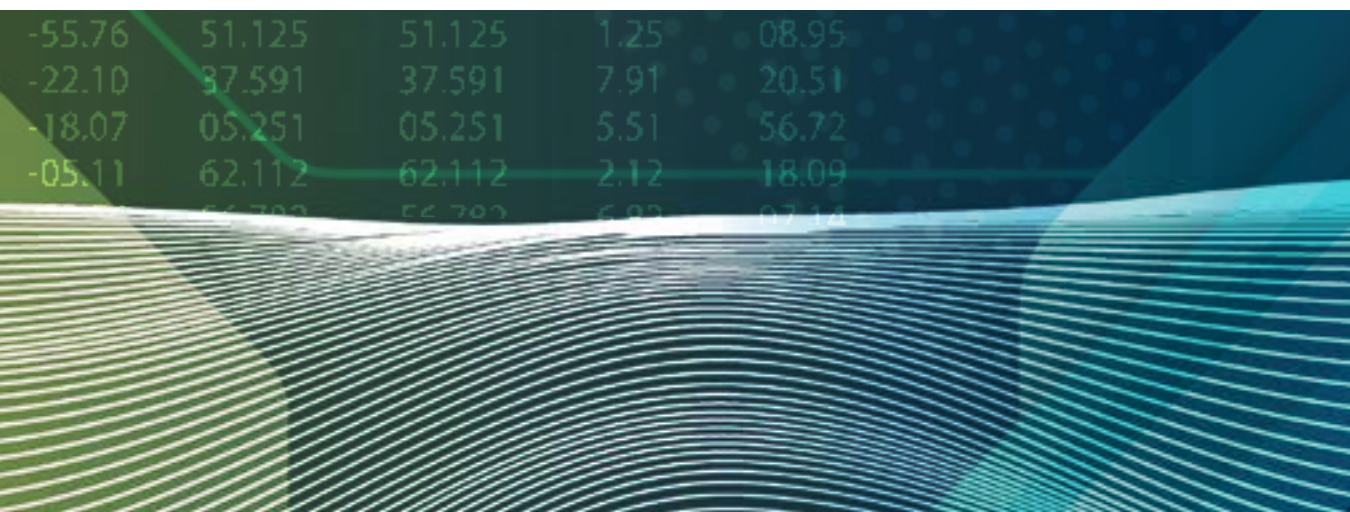




## EXAMPLE

PROJECT	PUBLIC ACTOR(S) INVOLVED	INSTITUTIONAL INVESTOR
Foresight Hoddesdon Waste-to-Energy Plant	UK Green Investment Bank	P3P Partners, NOY Infrastructure and Energy Fund
SolarReserve Crescent Dunes STEG Plant	United States Department of Energy	Canada's Public Sector Pension Investment Board, Ontario Teachers' Pension Plan
Seine Rive Gauche	French Treasury	KGAL Investment Management
Hindustan Solar	Asian Development Bank (ADB)	Undisclosed
Valcour Wind Energy- Clinton County Wind Farm I	NY Green Bank	Institutional investors through Carlyle Power Partners II
Thames Tideway Tunnel	Government of United Kingdom	Allianz, Swiss Life Asset Managers, Undisclosed institutional investors through Amber Infrastructure Group, Dalmore Capital Limited
Sirius Solar Plant	National Treasury, Development Bank of Southern Africa (DBSA), Multilateral Investment Guarantee Agency (MIGA)	Sanlam Life Insurance
Elzaig Hospital Campus Project	Multilateral Investment Guarantee Agency (MIGA)	Undisclosed
SolarVision Celina PV Plant	US Department of Treasury, Ohio Finance Fund	Institutional Investors through New Energy Capital

**Source:** Authors, based on Röttgers, Tandon and Kaminker (2018<sup>[9]</sup>) and Kaminker (2016<sup>[8]</sup>).

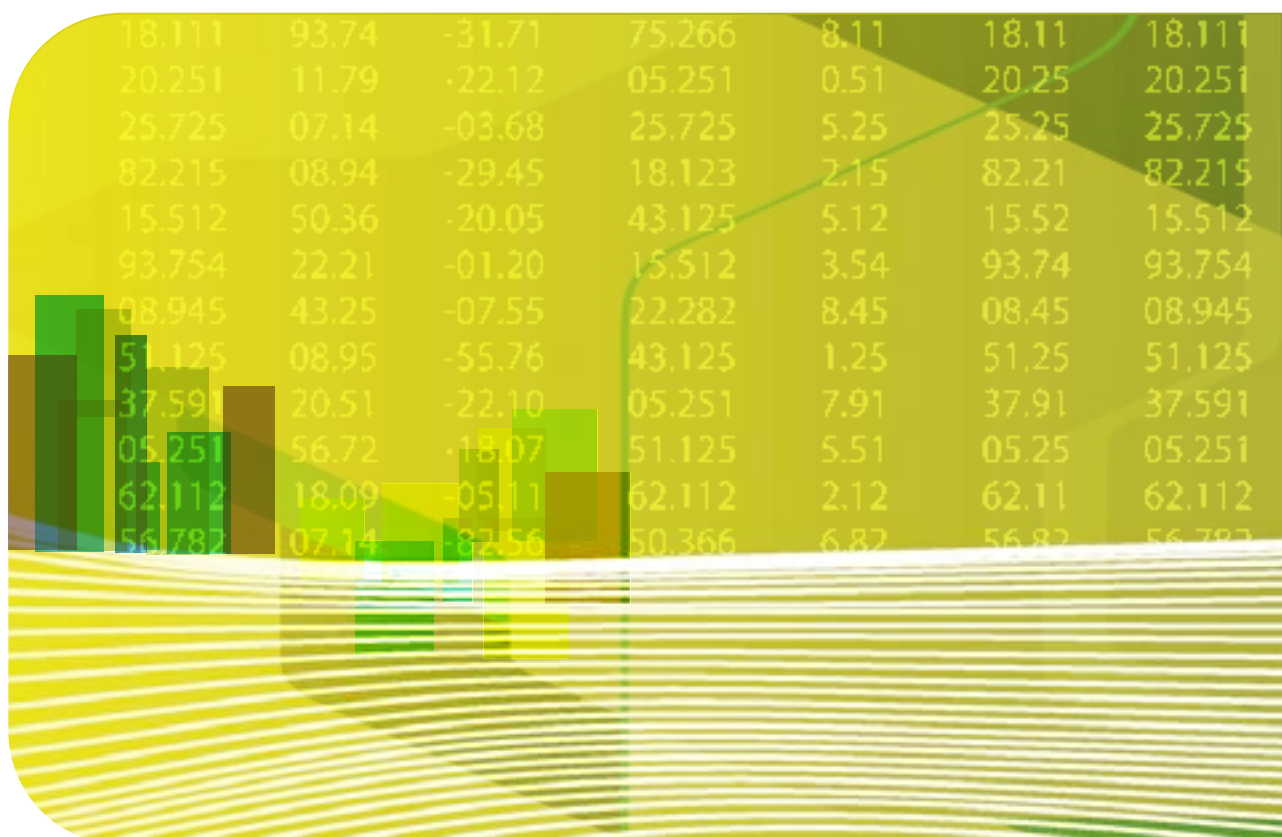


## Typology of transaction enablers

Transaction Enablers		
NAME	DESCRIPTION	FREQUENCY IN DATABASE
Warehousing and pooling	Bundling together smaller projects or demand to achieve commercial scale that is attractive and viable for institutional investors.	15
Offtake agreements	Agreements/arrangements with a public actor that has the effect of mitigating project off-take risk (not necessarily for taking off the core product; could also be a renewables quote/certificate).	5
Syndication platform	Any mechanism put in place by a public actor to syndicate investments by institutional investors	1

**Note:** Blended finance has been removed from this iteration. Please see [call-out box 2] for details.

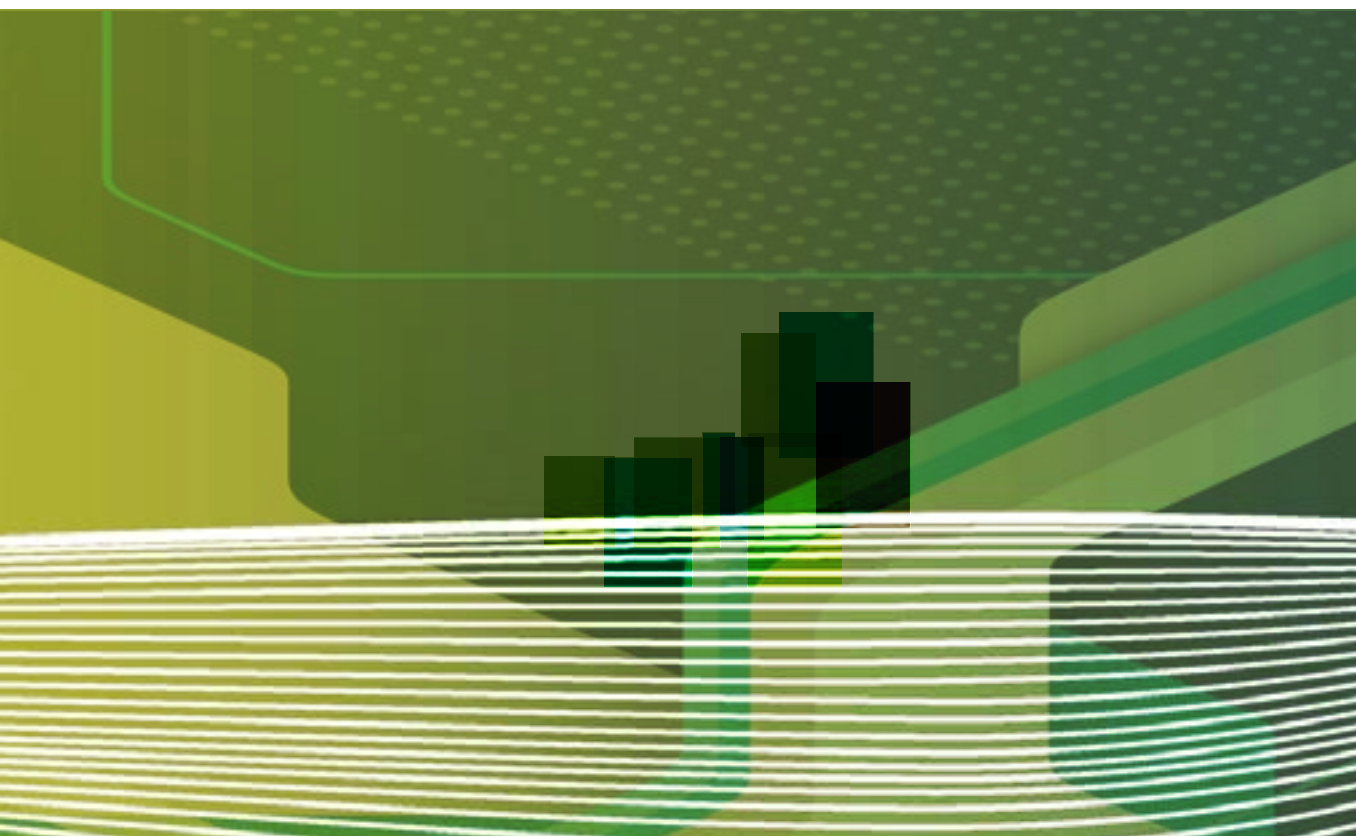
**Source:** Authors, based on Röttgers, Tandon and Kaminker (2018<sub>[9]</sub>) and Kaminker (2016<sub>[8]</sub>).

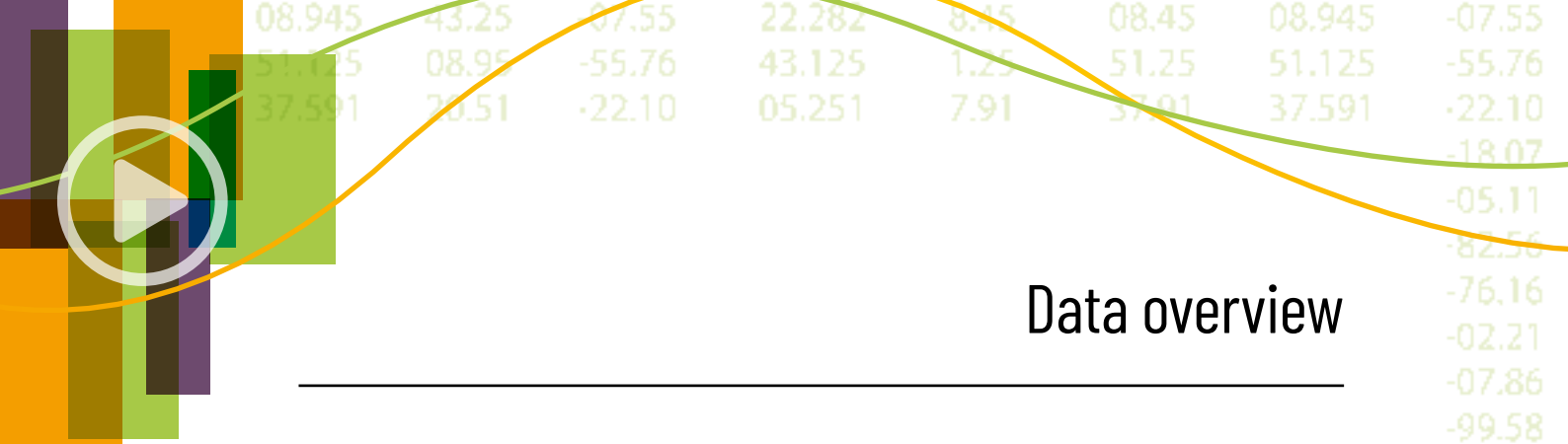


*Transaction enablers are defined as interventions, by a public entity, that do not finance a project directly or put public funds at risk, but rather facilitate investment from other actors, private or public. Transaction enablers are purely catalytic and no contingent liability is assumed by public funds.*

## EXAMPLE

PROJECT	PUBLIC ACTOR(S) INVOLVED	INSTITUTIONAL INVESTOR
Tappaghan Mountain Wind Farm	UK Green Investment Bank	Undisclosed institutional investors through the Greencoat UK Wind PLC
Kiata Wind Farm	Government of Victoria	Undisclosed institutional investors through asset management company
SolarVision Celina PV Plant	Government of the United States	Undisclosed institutional investors through New energy Capital, Clean Tech Infrastructure Fund





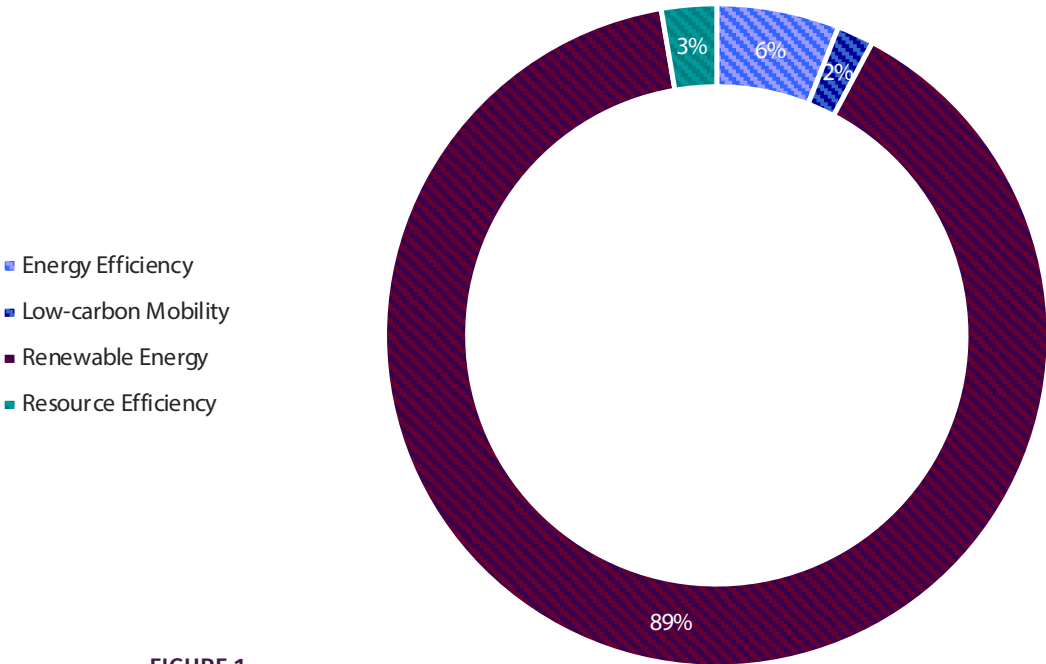
# Data overview

The dataset updated for this policy paper comprises 328 projects where institutional investment is observed alongside one or more interventions by a public actor (or multiple) at the project level. Projects in the dataset span 10 sectors and 30 G20 jurisdictions. The dataset has been constructed using data from commercial databases as well as data points gathered through desk research. Given that relevant data is not collected systematically at the level of the public actor, this database cannot claim to be exhaustive. The dataset and the policy paper are a contribution to evolving OECD efforts to provide deeper insights into public de-risking of green infrastructure.

The dataset is dominated by renewable power projects (89%), driven by wind (54%) and solar (20%). The dataset catalogues investment transactions by project stages: secondary stage (49%), greenfield (46%) and brownfield (5%). The majority of recorded observations are distributed among the United Kingdom, South Africa, Brazil, France and Australia (52% combined).

Seven types of public actors are captured in the dataset: governments and public authorities, multi-lateral development banks (MDB), bi-lateral and domestic development banks (DB), public green investment banks (GIB), state-owned entities (SOE), export credit agencies (ECA) and other international organisations (IO). The sample records a diverse suite of 19 de-risking instruments and 3 transaction enablers deployed by public actors across G20 countries.

The online data explorer accompanying this analysis allows a detailed view of the underlying dataset. The following sections outline key findings based on the dataset and highlight innovative de-risking approaches through mini case studies.

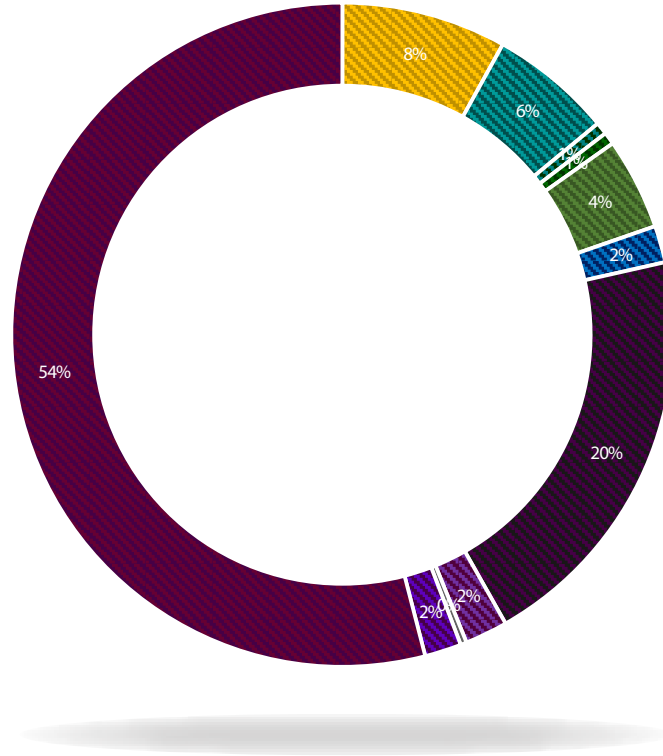


**FIGURE 1**  
**Breakdown by Category**

**Source:** Authors, based on primary data research as well as Preqin (2020<sub>[10]</sub>) and IJ Global (2019<sub>[11]</sub>).

**FIGURE 2**  
Breakdown by Sector

- Biomass & Waste
- Energy Efficiency
- Environmental Remediation (1%)
- Geothermal (1%)
- Hydro
- Public Transport
- Solar
- Solar / Wind
- Waste Treatment
- Water
- Wind



Source: Authors, based on primary data research as well as Prequin (2020<sup>[10]</sup>) and IJ Global (2019<sup>[11]</sup>).

## Public intervention to catalyse investment

Fund capitalisation is the most used route to provide public support for infrastructure projects and crowd in private investment (239 projects). Almost all instances recorded in the sample involve equity provision by a development finance institution (led by multilateral development banks (MDBs) with 172 projects and followed by development banks (DBs) with 76 projects. Fund level co-investing is largely observed in developed economies, with renewables projects being the largest recipients of funding through such structures.

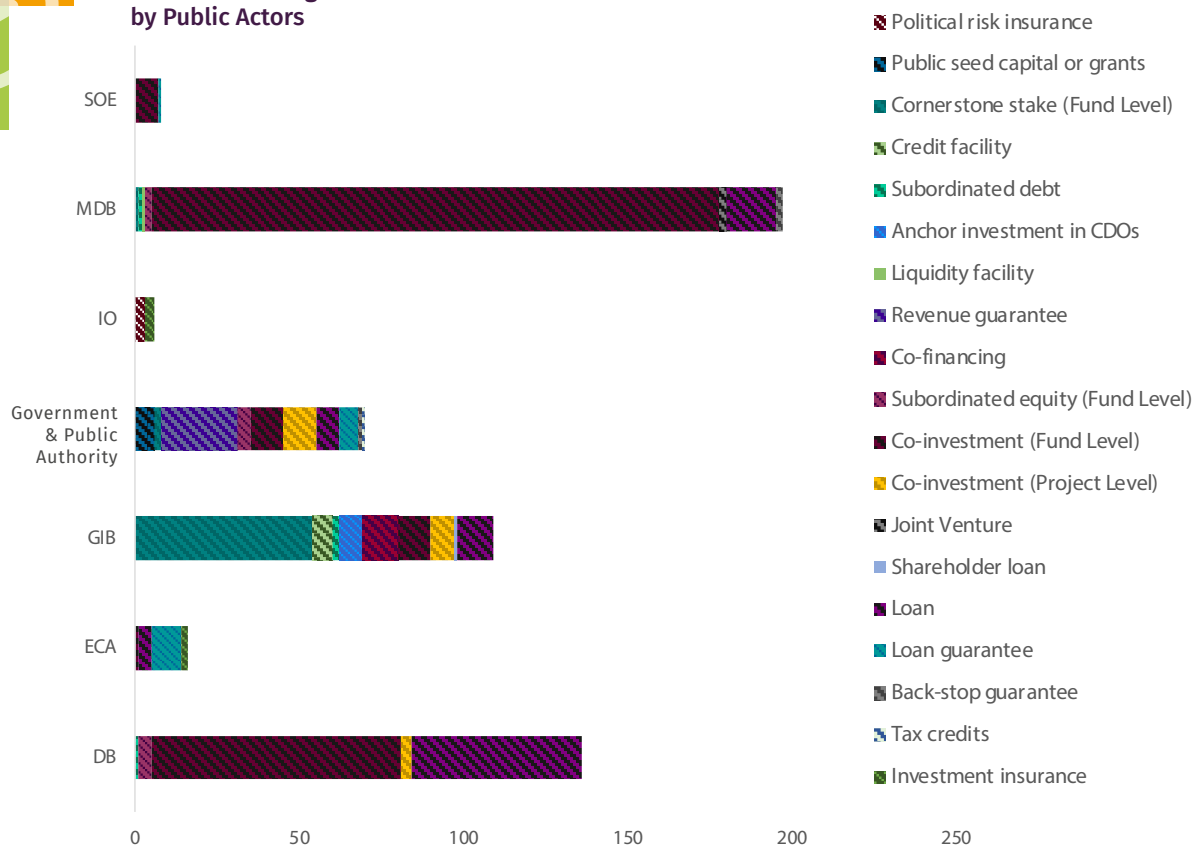
The sample contains relatively few instances of co-investment directly at the project level (15 projects). These are mostly equity provision by the UK GIB before it was privatised. In addition, direct involvement of the Canadian federal and Canadian provincial governments is observed in two projects.

Loans are most commonly provided by national development banks; they also are the most-used instrument by this type of public actor. The prime target of DB loans are renewable energy projects, in particular wind power plants.

Cornerstone stakes at the fund level are used mainly by GIBs. The UK GIB (before privatisation) accounts for the most instances of anchor investment in the dataset.

FIGURE 3

Use of De-risking Instruments by Public Actors



Source: Authors, based on primary data research as well as Preqin (2020<sub>[10]</sub>) and IJ Global (2019<sub>[11]</sub>).

The widest suite of instruments is deployed by governments and public authorities (11 different instruments) followed by MDBs (10) and GIBs (10). The dataset, however, shows that governments and public authorities deploy more vanilla instruments (primarily guarantees) with a focus majorly on demand side<sup>3</sup> interventions. The dataset records a variety of guarantees, of which revenue guarantees are most common. Compared to governments, development finance institutions focus more on direct provision of capital through loans and fund capitalisation, and GIBs focus on market creation, exercising a wider latitude in the types of financial products accessed. Specialised entities like GIBs have a dynamic mandate and enjoy the flexibility to deploy more eclectic solutions to respond to market needs (see Case Study 1).

Public actors may intervene alone or in partnership with other public actors to mitigate risks or enable transactions. In the vast majority of projects (70%), intervention from only one public actor is observed. Governments and GIBs appear most likely to intervene in combination with other public actors. In terms of stage of project, GIB interventions appear to be evenly distributed, while government interventions tend slightly to favour projects in the primary stages. The majority of MDB interventions, on the other hand, are targeted at secondary stage projects.

The data suggests that different types of public actors have different structures, risk appetites and consequently interventions that they deploy, perhaps as a function of their different mandates. For example, on the one hand national development banks take a more traditional approach based on lending, using instruments such as loans and loan guarantees. The more novel green investment banks on the other hand have a stronger focus on fund-based tools, likely stemming from their mandates and employee composition. Given these differences, consciously developing partnerships between different types of public financial institutions could seek to leverage complementary interventions and thereby deliver more holistic and effective de-risking strategies.

3 Interventions, for instance revenue guarantees, that strengthen the demand for the project thereby reducing demand risk.

37.591	50.366	0.66	22.36
78.056	32.025	2.25	78.56
11.789	11.789	1.89	82.25

## Case Study 1.

### Accelerating investments in low-carbon infrastructure - Creating secondary markets -

As we enter the ‘decade of delivery’, there is an imminent need to scale-up investment in sustainable infrastructure. Accelerating finance for infrastructure requires interventions on both the supply and the demand side. While much attention is paid to improving the supply of assets (creating pipelines of bankable projects), demand side interventions must evolve in tandem to foster an infrastructure finance ecosystem that can efficiently allocate capital at the pace and scale needed. The central idea here is matching the right kind of investor with the appropriate project risk.

Every stage of a project’s lifecycle carries different types of risks. For instance, during the construction stage, a project has an elevated risk profile that is unsuitable for institutional and retail investors. Short-term financiers like project developers and banks have a higher risk tolerance and are much better placed to fund construction. However once operational, a project’s risk profile becomes more acceptable to long-term investors like pension funds and sovereign wealth funds who need low-risk, long-term cash flows to match future liabilities. By taking operational assets off the balance sheet of banks and project developers, institutional investors can free up scarce construction stage finance for new projects. Secondary markets play a key role here. A well-functioning secondary market for infrastructure is pivotal to offload operational assets to long-term investors and recycle capital. Efficient secondary markets could address liquidity concerns, optimise risk pricing and reduce the overall cost of capital for infrastructure projects.

The public sector has a role to play in developing secondary markets for sustainable infrastructure. Australia’s Clean Energy Finance Corporation (CEFC) and New York State’s Green Bank provide two such examples.

#### Creating secondary markets for sustainable infrastructure in Australia - The role of CEFC -

In 2018, the National Australia Bank (NAB) bundled eight loans it had extended to seven renewable energy projects, into a portfolio worth AUD 200 million. The bank packaged 75% of the portfolio into a close-ended investment vehicle that issued project bonds to private investors. CEFC made an AUD 90 million cornerstone investment in the offering to catalyse institutional investors. Insurance Australia Group, the largest insurance company in Australia, invested AUD 50 million alongside CEFC. In a first for Australia, the NAB low-carbon shared portfolio provided institutional investors an opportunity to get exposure to clean energy infrastructure without investing in single projects directly. The loan repayment by underlying projects are passed through to bondholders. NAB retained 25% of the portfolio on its own balance sheet and absorbed the management costs. The transaction allowed NAB to free up capital to finance new projects by shifting assets to investors with commensurate risk appetite.

#### Creating secondary markets for sustainable infrastructure in the USA - The role of NY green bank -

Launched in 2014, the NY Green Bank has a specialised mandate to leverage private capital and expand clean energy markets. To that end, the NY Green Bank provides long-term refinancing to clean energy projects with merchant risk to facilitate their acquisition. The NY Green Bank targets operational projects that do not benefit from long-term offtake agreements and are exposed to market risk. The intervention is designed to demonstrate the viability of long-term refinancing of clean energy projects with merchant risk to commercial banks. NY Green Bank recapitalises projects along with other commercial banks. Through its interventions, the NY Green Bank hopes to (i) improve liquidity in the secondary market; and (ii) spur large-scale deployment of renewables by signalling to project developers and financiers that there is enough capital available for new projects to be refinanced and/or acquired.

**Source:** CEFC (2018), NAB Low Carbon Shared Portfolio opens up investment opportunities, <https://www.cefc.com.au/case-studies/nab-low-carbon-shared-portfolio-opens-up-investment-opportunities/>; IAG (2018), IAG Climate Action Plan 2018, [https://www.iag.com.au/sites/default/files/Documents/Climate%20action/IAG\\_Climate\\_Action\\_Plan\\_October\\_2018\\_1.pdf](https://www.iag.com.au/sites/default/files/Documents/Climate%20action/IAG_Climate_Action_Plan_October_2018_1.pdf); Climate Bonds Initiative (2018), Green Bond Fact Sheet NAB Trust Services Limited, <https://www.climatebonds.net/files/files/2018-06%20AU%20NAB%20Trust%20Services%20Limited.pdf>; NAB (2018), More Investment in Renewable Energy Projects, <https://news.nab.com.au/more-investment-in-renewable-energy-projects/>; NY Green Bank (n.d.), Portfolio, <https://greenbank.ny.gov/Investments/Portfolio>; Green Bank Network (2020), New York Green Bank, <https://greenbanknetwork.org/ny-green-bank/>.



# De-risking instruments and transaction enablers

Across the 328 projects, the dataset reports 398 uses of de-risking instruments. Public de-risking strengthens the financial viability of projects by transferring extra risk to the public sector. Depending on the specifics of the project, de-risking instruments can address a range of risks including credit, counterparty, merchant and political risks. This creates a risk profile more acceptable to private investors, including institutional investors. Almost all observed projects benefitted from at least one de-risking instrument (very few benefitted from transaction enablers only) while more than half of the projects involved the use of more than one.

Different de-risking instruments have different mobilisation potential. Figure 4 highlights the use of fund level co-investment for more established technologies (e.g. wind, solar and hydro) as opposed to cornerstone stakes to crowd in private money for technologies that are relatively less commercially established or underserved (e.g. energy efficiency). Higher risk-taking by public capital in smaller-scale projects or sectors with new business models and technology creates a demonstration effect.<sup>4</sup> To deploy limited public capital to its greatest effect, public actors therefore have to consider the instrument with the greatest possible impact. For example, if a market is established, i.e. sizeable price decreases and leaps in technology development cannot be expected and deployment is beyond a demonstration effect, public actors may consider using funds in other markets. The UK GIB, for instance, played a strategic role in jump-starting the wind market in the United Kingdom. Similarly, the NY Green Bank focuses on demonstrating the viability of secondary markets for refinancing project loans in the United States.

## Investment channels and institutional investors

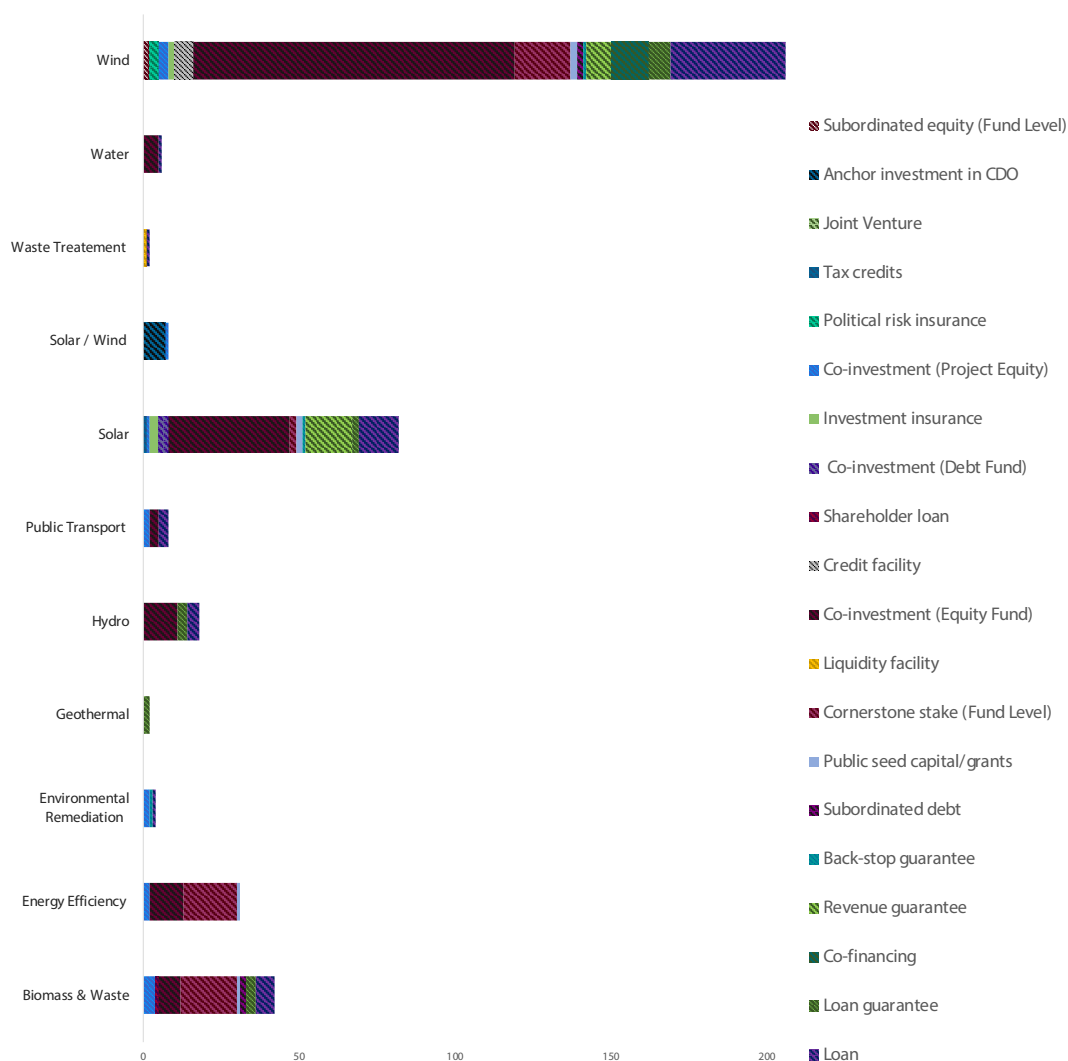
OECD (2015<sub>[12]</sub>) identifies eight channels for project-level investment, i.e. potential combinations of equity/debt, direct/intermediated and listed/unlisted investments in projects. Over 80% of institutional investment in the data presented here is channelled through funds providing project equity (intermediated unlisted project equity). Institutional investors exhibit a preference towards unlisted fund structures that allow risk sharing, scale, professional management and limited liability. After intermediated unlisted project equity, the most commonly accessed investment channels are direct unlisted project equity (6%) and direct unlisted project debt (5%). The primacy of these channels is consistent with the empirical findings in (OECD, 2020<sub>[2]</sub>). The dataset here focuses on real economy investments. Hence it is unsurprising that all recorded observations are unlisted projects.

In terms of project stage, institutional capital channelled through unlisted funds (equity and debt) appears to be equally distributed between primary and secondary stage transactions. Direct project-level equity and debt provision tilt slightly towards the primary stage. While the sample underlying this analysis does not claim to be exhaustive, these findings suggest a break from the conventional association of institutional investors and low risk appetite. Low-yielding traditional assets have prompted investors to look to alternatives including infrastructure for returns. (OECD, 2020<sub>[2]</sub>) highlights an industry shift towards riskier infrastructure strategies and rising investor interest in direct infrastructure debt provision. Both of these trends indicate potentially higher institutional capital flows towards primary stage projects in the future.

4 Proving viability of the project or technology to incentivise uptake by private investors and foster new markets.



**FIGURE 4**  
Sectoral distribution of de-risking instruments



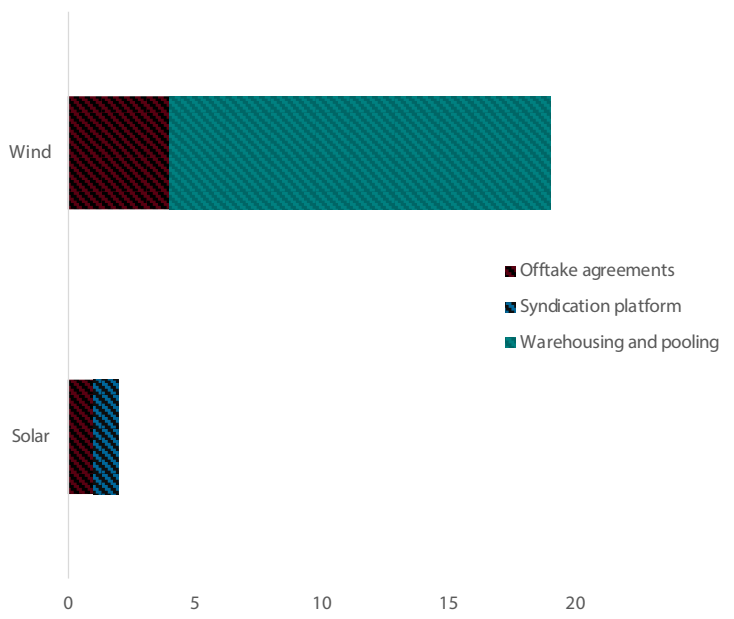
Source: Authors, based on primary data research as well as Preqin (2020<sub>[10]</sub>) and IJ Global (2019<sub>[11]</sub>).

De-risking instruments may be deployed individually or in combination. Complex projects may need a carefully designed multi-pronged risk mitigation approach to reach financial close. The Thames Tunnel Tideway project in the UK is a case in point of synergistic use of de-risking instruments (see Case Study 2).

The database captures 22 uses of transaction enablers, as shown in Figure 5. This points to a relatively limited deployment of these techniques, despite their strengths.

Instead of assuming liability on public funds, governments and other actors can attract investors by facilitating transactions e.g. through warehousing. Securitising small-scale projects to achieve institutional size and quality provides a supply side push. This can be critical in filling market gaps and directing capital to underserved sectors. Use cases include bundling capital needs of municipalities to facilitate joint issuances (e.g. Kommuninvest in Sweden) and aggregating distributed renewables to recycle capital for new asset creation (e.g. in emerging and developing economies where distributed solar is more suited than utility scale plants to increase energy access).

50.366	22.36	-05.81	58.065	0.66	50.66	50.366	-05.81
32.025	78.56	-09.55	43.125	2.25	32.25	32.025	-09.55
11.789	82.25	-15.12	18.111	1.89	11.89	11.789	-15.12
							-01.25
							-31.71
							-22.12
							-03.68
							-29.45
							-20.05



**FIGURE 5**  
Sectoral distribution of transaction enablers

**Source:** Authors, based on primary data research as well as Preqin (2020[10]) and IJ Global (2019[11]).

Encouraging securitisation can help create new markets and expand the investor base for green infrastructure (OECD, 2020<sup>[2]</sup>). Case study 3 discusses the potential of financial engineering to upscale private infrastructure investment, highlighting a Singaporean debt take-out facility that securitised infrastructure projects.

## Conclusion

Targeted de-risking by the public sector can capitalise on the current momentum towards green infrastructure and direct money towards green assets critical for sustained socio-economic growth. This action could support delivering the global commitments under the Paris Accord and the SDGs.

As the above figures show, currently much of institutional investment made in projects with public de-risking instruments are in already mature technologies. To build new markets, public actors might consider using public de-risking finance for the riskier end of the technology spectrum. To overcome issues of scale for mature technologies, public actors may consider an increased use of transaction enablers such as securitisation.

While in principal all public actors have the capacity to effectively deploy innovative and diverse de-risking instruments, green investment banks stand out in that regard. As the data shows, they use a larger number of available de-risking instruments. Future research could show if the more varied use of these instruments in comparison to e.g. MDBs and NDBs was more efficient in terms of capital use, and in the long-term led a more suitable set of instruments available for specific financing needs.

Green infrastructure is critical not just for sustained socio-economic growth but also for building back better in the aftermath of COVID-19. As we enter a decisive decade for delivery, it is critical that governments take bold and innovative action. Combined with enabling investment policies, governments can draw on the innovation in the financial sector to deepen domestic capital markets and scale up private investment towards critical policy objectives.

4 Proving viability of the project or technology to incentivise uptake by private investors and foster new markets.

37.591	50.366	0.66	22.36
78.056	32.025	2.25	78.56
11.789	11.789	1.89	82.25

## Case Study 2.

### Multipronged approach to credit enhancement-de-risking envelope for the Thames Tunnel Tideway

Governments can use a variety of tools and techniques to de-risk infrastructure projects and spur private investment. At the heart of any de-risking measure lies the ‘back-to-back’ principle of risk allocation, i.e. each risk must be ascribed to the party best suited to shoulder it. In markets with well-established project finance structures, the private sector can efficiently allocate project risks itself. However, certain infrastructure projects may carry certain idiosyncratic risks that need to be mitigated by the government to reach financial close.

Public support that is targeted and additional can achieve optimal cost of capital by shouldering/mitigating extra risk(s) and lowering the overall risk pricing. As a principle, to avoid crowding out private investment, intervention(s) by the government must offset risks that the private sector will not bear, and should not take risks that the private sector can and will bear. This may involve deploying single instruments for a specific risk or permutations of different ones to mitigate a combination of risks. The Thames Tunnel Tideway (“Project”) is a good example of targeted, multi-pronged de-risking by the British Government to mobilise private investment.

#### Innovative de-risking to leverage private capital

The Tideway project is an ambitious 25 kilometre-long sewage tunnel being constructed 65 meters under the Thames. Once completed, the tunnel will prevent sewage discharge in the river and significantly improve its water quality and ambient environment. The project is being executed by a consortium (Bazalgette Tunnel Limited) comprising Allianz Capital Partners, Amber Infrastructure, Dalmore Capital and DIF Capital Partners at a cost of GBP 4.2 billion (2011 prices), with initial debt provided by a syndicate of six banks. To incentivise private investment however, the UK Government implemented customised regulations for the construction period and provided a contingent financial support package.

Typically, infrastructure assets generate revenues only once they are operational. To increase returns, the bespoke regulatory framework allows the project to generate inflation-linked revenues right from the beginning of the construction phase. Bill payments by 15 million wastewater consumers constitute this revenue stream. By creating a stream of cash flows during the construction and testing phases, the UK Government enhanced the economic attractiveness of the project.

The Government further acknowledged that the project carried certain risks that private investors would not be comfortable with. To catalyse investor interest and optimise the risk pricing, the Government provided a contingent financial support package. The support package uses a combination of de-risking instruments to offset excess risks for Bazalgette Tunnel Limited (“infrastructure provider”). The package agreed to and provided by the Department of Environment, Food and Rural Affairs (DEFRA) includes:

- Insurance covering commercial losses in excess of the infrastructure provider’s policy cover.
- Temporary liquidity facility in case the infrastructure provider is unable to raise debt from the markets due to disruption caused by a national or international economic or political event.
- Agreement to infuse additional equity in the event of cost overruns.
- Agreement to make an offer for equity and debt issued by the infrastructure provider in case the latter becomes insolvent.
- Agreement to provide compensation to equity and debt providers in the event of project termination.

The support package lowered the downside risk for equity and debt providers through an innovative bundling of de-risking tools and techniques. The bundling approach allowed the Government to address a range of excess risks across the project without a high initial capital outlay. Though the approach employed to finance the Thames Tunnel is specific to the project, it highlights the potential of bundling de-risking instruments and transaction enablers to design a composite risk envelope that can attract private capital.

Source: <https://doi.org/10.1787/9789264269064-en>; <https://www.ashurst.com/en/news-and-insights/legal-updates/uk-infrastructure-innovations-in-government-support/>; <https://www.dif.eu/investments/thames-tideway-tunnel/>; <https://www.amberinfrastructure.com/news/press-releases/2015/bazalgette-consortium-awarded-for-thames-tideway-tunnel-project/>; <https://www.tideway.london/about-us/>, [https://www.itf-oecd.org/sites/default/files/docs/thames-tideway-tunnel\\_3.pdf](https://www.itf-oecd.org/sites/default/files/docs/thames-tideway-tunnel_3.pdf).

50.366	22.36	-05.81	58.655	0.66	50.66	50366	-05.81
32.025	78.56	-09.55	43.125	2.25	32.25	32.025	-09.55
							-15.12
							-01.25
							-31.71

## Case Study 3.

### Leveraging financial engineering for green infrastructure investment - Securitisation and structured products

The COVID crisis has put governments across the world under high fiscal pressure. Rising public debt and constrained fiscal space in many jurisdictions are creating increased reliance on the private sector for bankrolling future infrastructure development, and reinforcing need for the public sector to play a central role in catalysing private investment.

Besides using limited public funds to credit-enhance projects, governments can foster a policy environment that encourages emergence and mainstreaming of innovative investment structures like securitised and structured products. Securitised vehicles (e.g. Real Estate Investment Trusts, or REITs) and structured products (e.g. Collateralised Debt Obligations, or CDOs) can (i) recycle limited capital, (ii) foster secondary markets, (iii) address the difference between actual and perceived risk pertaining emerging economies and (iv) fill market gaps, for instance, by providing scale.

#### Securitising infrastructure to upscale investment

REITs have existed since 1960. REITs bundle illiquid assets like income-producing real estate or infrastructure and issue securities against them. Securities/units issued by REITs are listed on stock exchanges and traded like corporate shares. Infrastructure REITs securitise self-liquidating infrastructure assets. Multiple examples of infrastructure REITs can be found in the transport, telecommunications and energy sectors in the United States.

By taking operating assets off the balance sheets of banks and project sponsors, REITs free up capital for new projects. By providing liquid access to illiquid assets, REITs and similar structures further enlarge the investor base and thus funnel untapped capital towards infrastructure development. Acknowledging the merits of REITs, the Chinese government for example is in the process of launching REITs focused on strategic infrastructure in a bid to revitalise its domestic infrastructure investment ecosystem (Notice Concerning Effectively Performing Infrastructure REIT Trial Project Application Work).

In India, Infrastructure Investment Trusts (INVITs) (similar in structure to REITs) are gaining renewed attention from the private and public sector alike. INVITs, like REITs, allow project sponsors including governments to monetise existing operational assets and reinvest released capital in new projects. Private developers and corporates in the energy, telecommunications and transport sectors have issued multiple trusts in the recent past and attracted prominent global institutional investors including Canadian and Australian pension funds. INVITs have also been directly adopted by the Indian government, with the first government-sponsored trust to be launched in early 2021.

Besides physical assets, REITs and INVITs can also be used to securitise a portfolio of mortgages or loans, providing further possibilities to revitalise bank lending. Such structures typically benefit from a favourable regulatory framework to buttress their attractiveness for investors. For instance, REITs in the United States are exempt from tax at the corporate level. An enabling policy architecture may promote the use of other securitised vehicles like and Master Limited Partnerships (MLPs; permitted to be used for investment in natural resources in the United States, and primarily used for fossil-fuel extraction) .

Securitisation is also a means to raise capital in the primary market. Exchange Traded Funds (ETFs) are emerging as an important source of securitisation. Inclusion of infrastructure-based asset backed securities (ABS) in ETFs can capitalise on the trend towards passive investment.

## Structured products

The process of structuring creates financial products tailored to meet specific criteria, e.g. regarding taxation and risk-return profile. Structured products like Collateralised Debt Obligations (CDOs) provide differentiated access to a common pool of underlying assets (collateral pool). Typically, the cash flows from the collateral pool are tranching to create varying risk-return offerings to cater to different investors.

Infrastructure CDOs involve bundling of project loans extended by banks and shifting them to other longer-term investors. A case in point is Bayfront Infrastructure Management (platform) jointly established by Clifford Capital and the Asian Infrastructure Investment Bank (AIIB) in Singapore. The platform acquires project loans from banks, aggregates them and issues senior tranches to institutional investors. Bayfront holds project loans on its own balance sheet while building a portfolio to securitise. Further, the platform retains the equity tranche of all CDOs it sponsors. To finance the acquisition of project loans, Bayfront issues debt that is guaranteed by the government of Singapore. It is interesting to note that Clifford Capital (one of the two shareholders) is owned by a group of institutional investors including Temasek (Singaporean SWF).

Bayfront is an example of balance sheet CDOs - designed to transfer assets off the balance sheets of banks and corporates to the CDO trust. The platform is modelled after a take-out facility piloted as a proof of concept in 2018 (Bayfront Infrastructure Capital) and is designed to allow institutional investors globally, access to Asian infrastructure debt. Bayfront enjoys strong support of the Singaporean government and the Monetary Authority of Singapore (MAS) and is an example of effective public sector leadership in leveraging financial innovation to address market challenges.

Facilities like Bayfront, that employ innovative financial structuring to fill market gaps, can be critical in upscaling institutional investment in green infrastructure. A fundamental barrier, however, is the availability of investment-grade projects to create the collateral pool - an acute challenge in many emerging and developing economies. For such structures to take off and be mainstreamed, it is essential that domestic infrastructure planning and procurement policies enable origination of bankable projects and the creation of a pipeline of investment-grade opportunities. There is a strong case for standardisation of contract terms and structures to enhance deal flow and reduce transaction costs. Several efforts are underway to make progress towards this. These include, for instance, an end-to-end technology-enabled platform proposed by the FAST-Infrastructure Initiative to drive standardisation and better risk management through enhanced workflow.

The Bayfront platform addresses the challenge of limited bankable infrastructure debt in Asia, by acquiring projects gradually and holding them in its own accounts until it has acquired a portfolio with the required institutional quality and scale. This is made possible by sovereign guarantee from Singapore. In jurisdictions where the supply of investment-grade project debt is not a limitation, governments, or specialised entities like GIBs, could use their warehousing and aggregation capabilities to promote synthetic CDOs that instead of acquiring the underlying assets use derivatives like total return swaps to gain absolute economic exposure to the underlying assets. This could accelerate the creation and issuance of such structures while minimising the contingent liability on public funds.

**Source:** Reuters (2018), Singapore readies first infra CLO, <https://www.reuters.com/article/singapore-readies-first-infra-clo-idUSL3N1TA3U2>; Bayfront, (2020) <https://www.bayfront.sg/>; China Banking News (2020), China's Infrastructure REIT Trials to Focus on Strategic and New Infrastructure, Exclude Offices and Apartments, <https://www.chinabankingnews.com/2020/08/04/chinas-infrastructure-reit-trials-to-focus-on-strategic-and-new-infrastructure-exclude-offices-and-apartments/>; The Economic Times (2020), NHAI InvIT plans to raise Rs 5,000 crore, <https://economictimes.indiatimes.com/markets/stocks/news/nhai-inv-it-plans-to-raise-rs-5000-crore/articleshow/78762946.cms>; S&P Global (2020), [China's Infrastructure REIT Market: From Slow Start To Big Bang?](https://www.spglobal.com/assets/documents/ratings/research/100046937.pdf), <https://www.spglobal.com/assets/documents/ratings/research/100046937.pdf>

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08.945	08.945	8.95	43.25
51.125	51.125	1.25	08.95
37.591	37.591	7.91	20.51
05.251	05.251	5.51	56.72
62.112	62.112	2.12	18.09
56.782	56.782	6.82	07.14
43.125	43.125	4.25	19.56
93.175	50.366	0.66	15.51
19.256	19.256	9.56	93.74
85.778	85.778	8.78	78.06
07.141	07.141	7.41	05.21
37.591	05.228	5.28	43.11
43.125	22.282	2.82	19.26
05.227	18.109	8.09	93.74
50.366	75.266	5.66	20.51

# De-risking Institutional Investment in Green Infrastructure: 2021 Progress Update

This policy paper catalogues tools and techniques used by public actors such as national development banks and green investment banks to mitigate project-level risks and attract private investment in infrastructure. The paper updates the dataset underlying the 2018 "Progress Update on Approaches to Mobilising Institutional Investment for Sustainable Infrastructure", to provide an expanded typology of de-risking instruments and highlight several novel approaches for mobilising institutional investment. The analysis provides development banks and other public financial institutions a nuanced view of options for targeted mobilisation efforts.

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