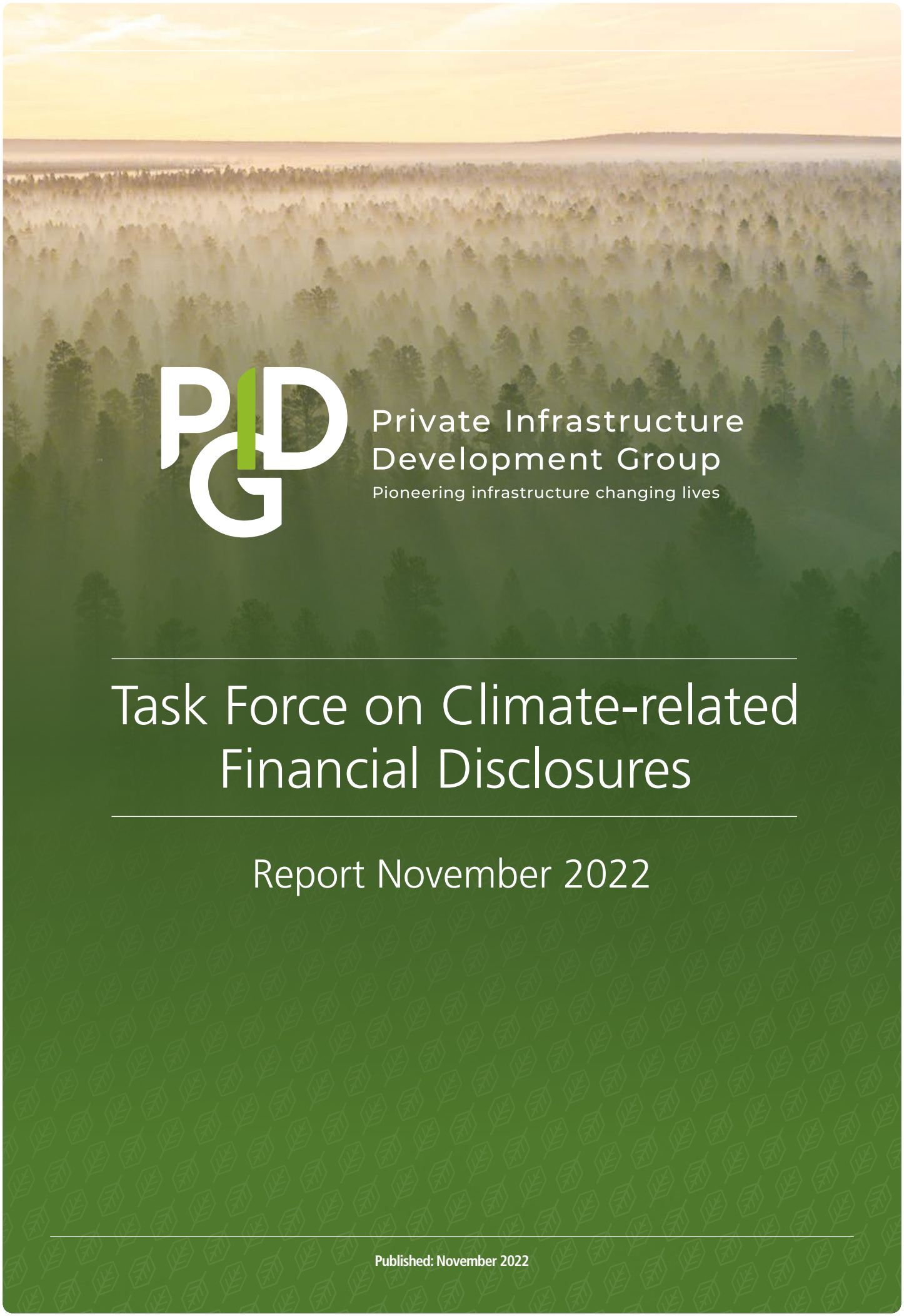


Task Force on Climate-related Financial Disclosures

Report November 2022

Published: November 2022

Forward

The Private Infrastructure Development Group (PIDG) is delighted to present our second annual disclosure report on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which PIDG became a supporter of in January 2020.

Building on our first disclosure report published in June 2021, this report outlines our progress over the past year to embed climate change mitigation and resilience throughout the operations and investments of all the companies in the PIDG group: InfraCo Africa, InfraCo Asia, the Emerging Africa Infrastructure Fund, GuarantCo and PIDG Ltd.

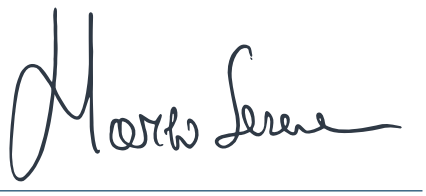
Last year's report focused on our actions to align our investments with a net zero trajectory based on Paris Agreement Goals, and this report highlights some of the resulting trajectories. This year, we focused on our actions to identify and manage physical climate risks that our investments might face.

PIDG operates in some of the countries most vulnerable to the impacts of climate change and our analysis confirms the exposure to severe or high risks for nearly all the investments in our portfolio. This is not surprising given the acceleration of the impacts of climate change and these risks, if unmitigated, will affect our portfolio.

These considerations have strengthened our resolve to dedicate time and resources to ensure that our investments are resilient to a changing climate, which is vital both to the commercial viability of the investments and to ensure that the anticipated sustainable development impacts are realised.

We know that we also need to look beyond the resilience of the assets and our investments, and our current priority is to further understand the impact of our investments on wider system resilience, by which we mean the resilience to climate shocks and change of the users and communities around the infrastructure that we fund. Choosing and designing investments that strengthen system resilience, support climate resilience and adaptation, and protect and restore nature in the process, will be a strategic driver of our future work.

We realise we have much further to go – and look forward to working with all our stakeholders as we progress our activities to further consider climate change in all our investments and operations.



Marco Serena
Head of Sustainable Development Impact,
Private Infrastructure Development Group (PIDG)

07/11/22

This TCFD Report applies to the following Covered Assets that align with the TCFD Recommendations as part of the PIDG group:

- *InfraCo Africa Ltd*
- *InfraCo Africa Investment Ltd*
- *InfraCo Asia Development Pte. Ltd*
- *InfraCo Asia Investments Pte. Ltd*
- *The Emerging Africa Infrastructure Fund Ltd*
- *GuarantCo Ltd*

01 Governance

The overall governance structure of climate change activities remains unchanged from last year, as outlined in the figure below.

However, increased activity has been undertaken to:

- Increase expertise at Board and committee level on climate change issues
- Further embed climate change throughout the organisation with focus on data collection procedures and risk management

This is described further in table 1 below.

PIDG Climate Change Approach is summarised in three key documents:

- PIDG Climate Change Strategy: the public document outlining PIDG's approach; aligned with PIDG Investment Strategy. This is described in section 2 of this report.
- PIDG Climate Change Standard: the internal document for investment teams providing sector specific guidance on aligning investments with PIDG Climate Change Strategy. This is described in section 3 of this report.
- Annual TCFD Disclosures: this public document reporting on progress.

Figure 1: PIDG Climate Change Governance Structure[1]

1. Where:

- *EAIF – Emerging Africa Infrastructure Fund*
- *HSES Committee – Health, Safety, Environmental and Social Committee*
- *TA – Technical Assistance*

Table 1: PIDG Climate Change Governance

Board and Owner oversight	Overall oversight of PIDG climate-related activities and TCFD metrics lies with the PIDG Ltd.'s Board of Directors (the "Board") and it is a standing item on the Agenda for each Board meeting. The Board meets quarterly, and the Board level sponsor is the Chair of the Board. A quarterly update is provided to the Board on relevant activities in the last quarter and planned for the next. The Board considers the impacts of climate change as part of wider discussions on the future strategic direction of PIDG, including in discussions around business planning, strategy and risk. Over the past year, examples of discussions the Board have undertaken relating to climate change include: • Oversight of PIDG Climate Change Strategy • Oversight of PIDG activities at COP26 and COP27 • Oversight of results of PIDG portfolio climate risk analysis and future approach to physical climate risks (Risk Committee of the Board) Where appropriate, climate-related activities will also be considered by PIDG Committees including, Audit, Risk, HSES, Investment and Credit Committees. As of January 2022, Rachel Kyte joined the PIDG Board, and is a member of both the HSES Committee and Risk Committee. Rachel Kyte served as special representative of the UN secretary-general and Chief Executive Officer of Sustainable Energy for All. She was previously the World Bank Group vice president and special envoy for climate change, leading the run-up to the Paris Agreement[2]. Rachel Kyte is a member of the UN secretary-general's high-level advisory group on climate action and an advisor to the UK presidency of the UN climate talks. Rachel Kyte is co-chair of the Voluntary Carbon Markets Integrity Initiative (VCMI), and chair of the FONERWA, the Rwanda Green Fund. Updates on climate-related activities are provided on an annual basis to PIDG Owners, or more frequently as required.
Management role	The PIDG Executive Committee (ExCo) level sponsor is PIDG's Head of Sustainable Development Impact. Update on climate-related activities is a standing item on the agenda of the PIDG ExCo (consisting of the PIDG Ltd.'s Executive Team and PIDG company CEOs) which meets twice monthly. An update is provided by the Head of Sustainable Development Impact at each meeting, with input from other members of the ExCo as required. PIDG ExCo reviews climate-related activities and makes recommendations to the PIDG Board as required. At an operational level, PIDG climate-related activities are led by the PIDG Sustainable Development Impact (SDI) team, co-ordinating input from Risk, HSES, Finance, Legal and all PIDG business units (namely InfraCo Asia, InfraCo Africa, GuarantCo and the Emerging Africa Infrastructure Fund) and PIDG Technical Assistance. PIDG SDI has six full time equivalent staff plus support from two consultants, one with specific responsibility and expertise on climate change. PIDG SDI is responsible for: • Climate change screening of all new investments by PIDG companies as part of the SDI Endorsement process • Collection of climate data for projects in operation for annual reporting, as part of overall SDI results monitoring process • Preparation of climate change related documentation (namely Climate Change Strategy; PIDG Climate Standard and TCFD reports), as well as Board and ExCo updates and external presentations.

2. The Paris Agreement is a legally binding international treaty on climate change, adopted by 196 Parties at COP21 in Paris, in December 2015 before entering into force in November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

Investments	PIDG applies a deliberate climate lens to its investments. Climate impacts are included in investment papers (as part of the SDI endorsement note) and are therefore considered as part of investment proposal approvals. More detail on how climate impacts are considered throughout the different stages of PIDG companies' involvement with a project are described in later sections of this document. Since 2020, in order to track progress of PIDG overall and PIDG individual company performance on climate change, PIDG has set a specific climate change Key Performance Indicator (KPI). In 2020, this KPI was related to alignment to the goals of the Paris Agreement for new energy sector investments. For the period 2021-23, this KPI relates to the carbon intensity of all new investments (tCO_2e/mUSD PIDG investment). Achievement of KPIs (including the climate change KPI) is directly linked to the performance appraisal and performance related payments of the PIDG companies. PIDG met the 2021 climate KPI as the carbon intensity of the investments financially closed in 2021 – measured in tCO2e/mUSD PIDG investment – was below the average carbon intensity of the investments financially closed in 2015-20. PIDG has undertaken a programme of capacity building to upskill staff on climate change considerations. This has included: • Webinar on COP26 by Rachel Kyte • Presentations on the Intergovernmental Panel on Climate Change (IPCC) reports by Head of SDI • Establishment of intranet site "PIDG Climate Hub" to share resources, questions and case studies on climate change • Vietnam Green Capital Market event organised by PIDG Institute and GuarantCo • On-going staff training on climate risk assessments for projects • Capacity building with clients including through a workshop with Orabank Togo
Operations	PIDG is working to consider climate change in all aspects of operations. Primary sources of emissions from PIDG operations are business travel and our offices. Whilst these emissions reduced in 2020 due to restrictions related to the COVID-19 pandemic, PIDG is conscious of the need to place our operations emissions on a net zero trajectory in a post-COVID-19 recovery period. This is discussed further in section 4 of this report. Beyond this, PIDG also considers climate in other areas of operations: our UK pension provider is Scottish Widows who have committed to halving the carbon footprint of their investments by 2030 and reaching net zero across all their investments by 2050[3]. Finally, climate considerations were included in the selection procedure of third-party asset managers selected to manage PIDG Group portfolios.

3. Our climate change approach | Responsible investment | Scottish Widows

02 Strategy

PIDG published its updated Climate Change Strategy in September 2021[4], outlining its overall commitment to support the goals of the Paris Agreement on Climate Change.

Specifically, the Strategy detailed PIDG's role in:

- investing in projects that assist countries where PIDG operates to transition towards a global net zero carbon economy by 2050, in the context of an equitable and just transition to net zero;
- demonstrating the technical and financial viability of innovative low carbon and climate resilient infrastructure in low income and emerging markets of Africa and Asia.

As outlined in the Strategy, in 2021-23, PIDG climate action will focus on four strategic priorities:

- **Priority 1:** Mobilise private climate finance in underserved, fast growing markets, demonstrating the viability of low carbon, climate resilient infrastructure for private investors.
- **Priority 2:** Strengthen climate change adaptation and resilience through our investments.
- **Priority 3:** Mobilise domestic investors, entrepreneurs and stakeholders in emerging markets in climate savvy investments, including through local currency solutions.
- **Priority 4:** Integrate climate and gender investment lenses in infrastructure investment to maximise the gender outcomes of climate related investment.

Supporting the Transition to Net Zero

As the global community moves to address climate change, government and investor policy shifts and the emergence of new technologies will lead to risks (and opportunities) for companies and investments that are misaligned to the transition to net zero. As outlined in our 2021 TCFD Report, PIDG has already taken measures to mitigate against transition risks in new investments through adoption of a Climate Change Standard for all new direct and indirect investments and the PIDG Investment Policy.

This means that PIDG will not finance, directly or indirectly:

- Coal or Heavy Fuel Oil (HFO) fired power plants.
- Upstream investment in coal, oil or gas extraction, processing or production.
- New transport infrastructure (road, rail, waterway and port) constructed mainly for the transport of fossil fuels.

Gas fired power plants and associated infrastructure (e.g. pipelines, storage and distribution) will only be supported following a positive outcome of a systematic assessment to determine their alignment with the Paris Agreement goals.

Similarly, investments that are based mainly on fossil fuel-based transport systems (e.g. airports; roads; ferries, railways and ports) will only be supported by PIDG following a positive outcome of an assessment to determine their alignment with the Paris Agreement goals.

Beyond this, PIDG is currently piloting an updated version of its Climate Standard which includes an approach to assess the alignment of investments in the manufacturing sector (steel, cement, chemicals and fertilisers) based on:

- Estimated Greenhouse Gas (GHG) emissions per tonne of product for each year during lifetime of PIDG involvement to determine if production is on a Paris Aligned trajectory, based on science-based sectoral pathways;
- Confirmation of Board level sponsor commitment to reducing GHGs in line with Paris Agreement goals; and
- Demonstration that the cleanest and most efficient technology is being used, and that provisions for allowing future technological switch to lower emission options are considered.

For new investments in the real estate sector, we continue to support developments that achieve IFC EDGE[5] certification.

Our next steps in this area include confirming our approach for investments via Financial Intermediaries, beyond current requirements to align investments supported by PIDG with the PIDG Climate Standard, to include reporting requirements in line with TCFD recommendations and the Global GHG Accounting and Reporting Standard for the Financial Industry (the PCAF Standard)[6].

4. PIDG-climate-change-strategy-paper-2021-dev-18.pdf
5. Home – EDGE Buildings
6. The Global GHG Accounting and Reporting Standard for the Financial Industry | PCAF (carbonaccountingfinancials.com)

Opportunities from the Low Carbon Transition

As outlined above, a key element of the PIDG Climate Change Strategy is demonstrating the viability of low carbon infrastructure for private investors in emerging markets.

PIDG is currently focusing on increasing investment in the following sectors:

- renewable energy – both on-grid and off-grid;
- transport – electric mobility;
- energy efficient affordable housing and sustainable cities; and
- developing the green bond market in underserved low income and emerging markets.

Case Study
Battery Storage

PIDG companies InfraCo Africa and EAIF, have supported two of the first grid scale solar projects with battery energy storage solutions (BESS) in Africa[7]:

- The 20MWAC Golomoti Solar photovoltaic project will deliver much-needed power to Malawi's national grid. It became operational in Q1 2022. With grant funding from Innovate UK, Golomoti Solar will pioneer implementation of a 5MW-10MWh BESS to reduce the national utility's reliance on hydropower and diesel generation, whilst ensuring that grid stability is maintained.
- The Cuamba Solar photovoltaic project will develop, construct and operate a 19MW greenfield solar plant with 7MWh BESS in Cuamba, Mozambique. It will also demonstrate the role of BESS in overcoming issues of intermittency from solar PV and 'firming' output of the solar plant to the grid. PIDG TA committed a Viability Gap Funding grant of US$7m, to support the project by enabling an affordable tariff, fund essential grid upgrades and the BESS.

Case Study
Electric mobility

PIDG company InfraCo Africa made its second EV investment in East Africa, providing USD 3m equity to Zembo to deploy 2000 new electric bikes and increase the number of charging stations to more than 60 in Kampala, Uganda.

The charging stations are solar-powered or utilise power from Uganda's national grid, the majority of which is derived from renewable sources. As part of global efforts to improve urban air quality and to achieve net zero emissions, Zembo's model has considerable potential for replication in other African cities.

In May 2022, GuarantCo and Axis Bank signed a portfolio guarantee framework[8] agreement to stimulate electric mobility in India.

Guarantco is providing a $200m local currency equivalent guarantee to unlock between $300 and $400 of lending in local currency to finance electric mobility ecosystems including:

- Manufacturing and distribution of EVs, batteries, components and charging infrastructure
- Services based on EV usage and/or to the EV sector
- Finance companies providing financing for the purchase of electric vehicles by consumers.

7. Note as these projects were not operational as of 31 December 2021, they are not included in the data in section 4 of this report.
8. As above

Case Study
Green bonds

In July 2022, PIDG supported the issuance of the first onshore, local currency, verified green bond in Vietnam, which is also the first Vietnamese corporate bond invested into by institutional investors with a partial rather than a full guarantee[9].

GuarantCo provided a $50m equivalent local currency guarantee which unlocked $75m investment from institutional investors in including Manulife and AIA. Vietcombank Securities (VCBS) a leading investment bank and securities firm in Vietnam acted as the mandate lead arranger on the transaction.

The bond proceeds will allow EVN Finance to issue longer term loans to finance capital expenditure of green infrastructure aligned with the company's Green Bond Framework including loans towards the fast-growing rooftop and ground-mounted solar sub-sectors in Vietnam. The green transaction contributes to Sustainable Development Goal (SDG) 7 (ensure access to affordable, reliable, sustainable, and modern energy for all) by enhancing Vietnam's energy and climate resilience.

Investing in Climate Resilient Infrastructure

PIDG works in some of the countries considered most vulnerable to the impacts of climate change and least prepared to deal with them. Changing weather patterns and increased numbers of extreme weather events caused by climate change have the potential to be a material risk for PIDG at a company level and also at an individual project level.

As well as considering the resilience of the asset itself as part of screening and due diligence procedures (see section 3), PIDG is also taking an active role in considering how the investment impacts on the resilience of the ecosystem in which it is located i.e. local communities, businesses and the natural environment. We assess whether a project meets 'do no harm' thresholds and seek to identify track any expected positive impacts on system resilience.

PIDG has undertaken a review of the existing portfolio to understand exposure to physical climate risks (see results in section 4). Next steps will involve discussions with sponsors to communicate results of the review to them and to understand any existing or planned measures to manage climate risks and, if none, to work with sponsors to implement plans to manage physical climate risks.

Case Study[10]
Physical Climate risk mitigation plan

GuarantCo is providing a 50% partial guarantee of a local currency (Malagasy Ariary) equivalent USD 9.3m loan to a syndicate of local banks to finance a 20MW solar PV project in Ambatolampy, Madagascar being developed by Green Yellow.

Physical climate risks were evaluated during due diligence undertaken by GuarantCo. The assessment concluded that cyclone risk was deemed medium. As a result, the sponsor has put in place insurance policies to cover cyclones, storms and flooding risks.

The sponsor is also investigating the use of a mechanical panel washing system which would reduce the amount of water needed to wash the solar panels from about 7,000 L/MW to 1,000-2,000 L/MW, thereby reducing risk of water stress for the local community and other water users in the vicinity of the plant.

9. As above
10. Note as this project was not operational as of 31 December 2021, it is not included in the data in section 4 of this report

Case Study[11]
TollCam

GuarantCo has provided a combined guarantee (partial credit and liquidity extension) of US$ 32.5 million in local currency to build, operate, and maintain 14 toll gates in Cameroon. In line with the PIDG Group process, these locations were assessed through the Moody's ESG Physical Climate Risk Assessment tool[12] which showed that several toll booths were at high risk of flooding and/or wildfire and/or heat stress.

This could lead to damage to the toll booths and road, potentially leading to lower toll revenues and higher operational costs, as well as health and safety risks to workers and users of the road.

The project sponsor, working with the GuarantCo team, has put in place a wildfire emergency plan to ensure that emergency procedures are in place in case of wildfire and that vegetation is cleared around the toll booths. For sites at risk of flooding, this has been taken into consideration by the EPC contractor, with a site drainage and maintenance plan being implemented.

03 Risk Management

Climate risks, both physical and transition, will impact on the existing risk categories considered by PIDG and PIDG companies. Given PIDG's mandate to alleviate poverty, PIDG considers impact of climate change on anticipated sustainable development impacts and on HSES, as well as financial risks.

Transition risks

are business-related risks which comes about through a shift towards a low-carbon and more climate-friendly future.

This includes:

- Changing legislation as part of an individual country's transition to a net zero economy and/or introduction of new technologies can lead to revenue risks
- Support to a project that is not Paris Aligned leading to reputation risks for PIDG and PIDG companies
- Increasing likelihood of litigation risk for transition risks that have not been sufficiently managed and/or mitigated.

Physical risks

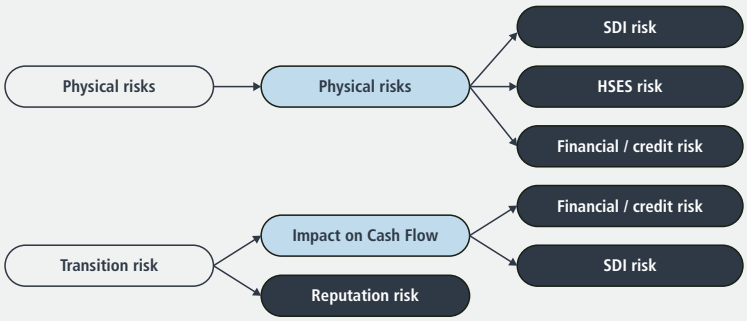
are changing weather patterns and increased numbers of extreme events caused by climate change. These have the potential to be a material risks at both an individual project level and therefore to PIDG's overall portfolio.

Potential impacts include:

- Extreme weather events such as temperature rises and flooding leading to unsafe working environments which can lead to HSES risks
- Extreme weather events leading to increased competition for natural resources, preventing planned operations and increasing HSES risks
- Damage to a project due to extreme weather events preventing planned operation which can lead to SDI risks as expected impacts don't materialise
- Damage to a project due to extreme weather events preventing planned operation and leading to financial/ credit risks as revenues may be reduced and operation costs increase.

11. Note as this project was not operational as of 31 December 2021, it is not included in the data in section 4 of this report.
12. Moody's ESG / Solutions / Climate (moodys.io)

Figure 2: High level mapping of transition and physical climate risks onto other PIDG risk categories (where SDI is Sustainable Development Impact and HSES is Health Safety Environmental and Social).



During the last year PIDG has implemented procedures to identify and manage climate risk for all new potential investments, as outlined in the tables below.

Work is ongoing to integrate the results of the screening into existing risk management processes:

- Impacts on HSES are currently included in HSES Risk register
- Impacts on sustainable development impact to be integrated into existing SDI management
- Impacts on financial returns and risk of default to be integrated into existing PIDG risk procedures with more work to be undertaken on translating results of screening into financial metrics/impacts.

Next steps also include:

- Development of methodology for overall physical climate risk score based on hazard exposure and sector vulnerability, and consideration of temporal aspects into overall methodology (i.e. how long assets are in the portfolio for)
- Development of methodology for adjusted physical climate risk score based on climate risk mitigation and management measures being implemented
- Development of guidance to support sponsors to reduce and manage identified climate risks.
- Further integration of climate considerations into PIDG's overall Risk Management Framework.

Table 2: Physical Climate Risk Screening Template

Physical climate risks arise from climate variability, extreme events and longer-term shifts in climate patterns due to climate change, and are a function of geography and vulnerability of the project type.	
Geography	*[detail on hazards in geographic location of asset]*
Vulnerability	**Indicator 1:** Dependency of project operation/ outputs on natural resources and weather (including water availability) **– High/ Medium/ Low**
	Indicator 2: Climate sensitivity of market demand for project/ project outputs **– High/ Medium/ Low**
	Indicator 3: Vulnerability of supply chain; reliance on secure transport routes and secure energy supply **– High/ Medium/ Low**
	Indicator 4: Reliance on labour for project operation **– High/ Medium/ Low**
Result	Resilience of the project: *[overview of potential physical climate risks to investment at asset level based on hazards and vulnerability]* Resilience through the project: *[overview of potential physical climate risks to investment at system level based on hazards and vulnerability]*

Table 3: Transition Risks Screening Template

Transition risks arise from policy shifts and new technologies as the world moves to address climate change. Similarly it is a function of geography and sensitivity of the project type.	
Geography	*[details of country NDC, key climate policies e.g. carbon tax]*
Vulnerability	**Indicator 1:** Direct impact of policy to reduce GHG emissions **– High/ Medium/ Low**
	Indicator 2: Indirect impact of policy to reduce GHG emissions **– High/ Medium/ Low**
	Indicator 3: Potential impact on revenue due to availability of lower carbon alternatives **– High/ Medium/ Low**
	Indicator 4: level of investment needed to complete in a lower carbon economy **– High/ Medium/ Low**
Result	*[overview of potential transition risks to investment]*

Table 4: PIDG Climate Risk Process for new potential investments

	Transition Risk	**Climate Resilient (to physical climate risks)**	
		Asset level (resilience of the investment)	**System level (resilience through the investment)**
Initial Screening pre-Due Diligence (SDI Clearance In Principal stage)	- Assessment of compatibility with goals to reach net zero by 2050 (sector specific guidance for energy, transport and manufacturing (draft) sectors in PIDG Climate Change Standard). - Initial estimation of GHGs during typical operation, emissions intensity (tCO_2e/mUSD invested by PIDG) and PIDG 'share' of emissions (in line with PCAF standard). - Assessment of exposure to transition risks based on country and sector	- Identification of physical climate risks and materiality assessment based on sector vulnerability and exposure to hazards in geographic location of asset(s).	- Identification of potential impacts (positive and negative) of investment to system level resilience to physical climate risks.
	- Prioritisation of investments that provide innovative solutions to climate related issues - Results of climate risk assessment included in Investment paper for the proposed deal - Dedicated Due Diligence actions to address identified risks - Prioritisation of deals that improve system resilience (as part of the next PIDG Strategy)		
Post Due Diligence (SDI Endorsement stage)	- Confirmation of compatibility with goals to reach net zero by 2050 and ex ante estimation of GHGs during typical operation. - Description of how material transition risks have been mitigated and how remaining material risks will be managed.	- Description of how material physical risks have been mitigated and how remaining material risks will be managed.	- Confirmation that project is expected to do no harm to system level resilience - If applicable, outline of how project contributes to • reduce vulnerability to identified physical climate risks at a system level • transformational outcomes to increase resilience

04 Metrics and Targets

4.1 GHG emissions

This year, GHG emissions from PIDG operations and investments have been calculated and peer-reviewed internally. GHGs from investments were calculated using the Global GHG Accounting and Reporting Standard for Financial Institutions published by the Platform for Carbon Accounting Financials (PCAF). An additional independent verification of all these figures will be carried out within two years, and, as a result, if necessary, adjustments to these figures may be published.

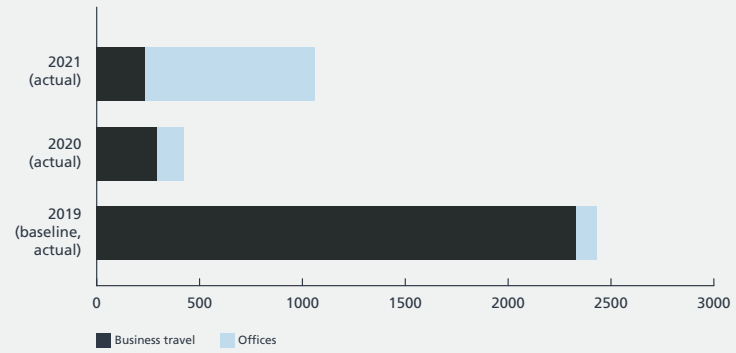
GHGs from PIDG operations

The table below shows emissions from our operations in 2019-21. This includes emissions from our offices as well as travel for business purposes. The figures do not currently include emissions from homeworking, procurement or commuting, although this is something we will consider in future years.

Table 5: Total Absolute GHG emissions from PIDG operations 2019-21 (tCO_2e)

	2019	2020	2021
EAIF (debt)	297	43	105
GuarantCo (guarantees)	956	178	379
InfraCo Africa (equity)	374	89	276
InfraCo Asia (equity)	270	39	5
PIDG Ltd. (holding company)	521	110	300
PIDG overall Group	**2419**	**459**	**1065**

Figure 3: Absolute GHG emissions from PIDG operations (tCO_2e)[13]



We will work in 2023 to further develop a detailed plan to reduce operations from travel and offices, having focused so far mainly on our investments and as we are still recalibrating our work and travel patterns after the COVID-19 pandemic.

13. Note higher office emissions in 2021 were largely due to higher attribution to PIDG, based on lower occupancy of the same offices over the COVID-19 pandemic.

GHGs from PIDG investments

PIDG has calculated the GHG emissions from investments using the Global GHG Accounting and Reporting Standard for Financial Institutions published by the Platform for Carbon Accounting Financials (PCAF)[14]. Results are presented in the table below for 2019-21 (note 2019 data was presented in our previous TCFD report published in June 2021; 2020 and 2021 data are new data).

Note that under the PCAF methodology, emissions from guarantees are only included when the guarantee is called and converts to a loan. PIDG however, wants to recognise the emissions from all guarantees so all are included here, whether the guarantee has been called or not, aware that we are mostly guarantying local banks that might not be reporting to TFCD recommendations.

In line with PCAF recommendations, PIDG includes scope 3 emissions where they are likely to be significant. At this stage, we have included scope 3 emissions from oil and gas infrastructure and processing, as well as from vehicles using roads infrastructure. In line with the PCAF standard, we shall look to increase our coverage of scope 3 emissions of investments to other sectors. Please see Appendix 1 for further methodological notes.

Table 6: Total absolute GHG emissions from PIDG investments 2019-21 (tCO_2e)

	2019 (reported in 2021)		2020		2021	
	Scope 1 & 2	Scope 3	Scope 1 & 2	Scope 3	Scope 1 & 2	Scope 3
EAIF (debt)	5,467,914	0	4,368,377	0	4,594,066	0
GuarantCo (guarantees)	2,439,199	5,050,111	1,103,374	4,881,555	161,410	4,881,555
InfraCo Africa (equity)	1,687	0	4,777	0	4,294	0
InfraCo Asia (equity)	106	0	262	0	82	0
PIDG overall Group	**7,531,078**	**5,050,111**	**5,408,181**	**4,881,555**	**4,690,033**	**4,881,555**

Table 7: Attributed GHG emissions from PIDG investments 2019-21 (tCO_2e)

	2019 (reported in 2021)		2020		2021	
	Scope 1 & 2	Scope 3	Scope 1 & 2	Scope 3	Scope 1 & 2	Scope 3
EAIF (debt)	241,389	0	184,717	0	204,390	0
GuarantCo (guarantees)	217,330	695,846	58,583	636,530	20,057	612,310
InfraCo Africa (equity)	267	0	345	0	851	0
InfraCo Asia (equity)	106	0	262	0	82	0
PIDG overall Group	**459,092**	**695,846**	**243,907**	**636,530**	**225,380**	**612,310**

Note:

- *as InfraCo Asia emissions are comparatively small, all are attributed to InfraCo Asia, as a conservative approach*
- *Overall Group total emissions from operational projects is less than the sum of total emissions by company as some investments are funded by more than one PIDG company so only counted once in the PIDG total to avoid double counting*
- *In some InfraCo investments, PIDG is the initial sponsor of a project. Lifetime emissions of these projects have not been reported here but this is something that will be included in future reporting.*

14. The Global GHG Accounting and Reporting Standard for the Financial Industry (carbonaccountingfinancials.com)

Avoided Emissions and Emission Removals

PIDG does not currently have any projects that result in emission removals although we are actively considering investment opportunities in this sector. In line with the PCAF Standard, we report below on avoided emissions from project financed operational grid connected renewable energy projects in operation[15]. As above, we include emissions avoided from guarantees.

Table 8: Total Avoided GHG emissions from PIDG investments 2019-21 (tCO_2e)

	2019 (reported in 2021)	2020	2021
EAIF (debt)	138,931	208,397	167,666
GuarantCo (guarantees)	39,244	108,693	123,576
InfraCo Africa (equity)	0	0	0
InfraCo Asia (equity)	54,671	109,342	0
PIDG overall Group	**232,846**	**356,965**	**203,269**

Table 9: Attributed Avoided GHG emissions from PIDG investments 2019-21 (tCO_2e)

	2019 (reported in 2021)	2020	2021
EAIF (debt)	30,387	50,849	44,780
GuarantCo (guarantees)	26,456	27,907	23,284
InfraCo Africa (equity)	0	0	0
InfraCo Asia (equity)	6,438	2,126	0
PIDG overall Group	**63,282**	**80,882**	**68,064**

Note, overall Group total emissions reductions from operational projects is less than the sum of emissions reductions by company as some investments are funded by more than one PIDG company so only counted once in the PIDG total to avoid double counting

15. In line with PCAF, we use the operating margin emission factor, published by the IFI Technical Working Group on Greenhouse Gas Accounting IFI TWG - List of methodologies | UNFCCC

4.2 Transition Risks and Investment in Climate Opportunities

PIDG expects to manage transition risks through its investment screening processes, climate strategy and standard. Nevertheless, an assessment of exposure of the existing portfolio to transition risks was undertaken over the past year. The scope of the assessment included investments that had reached operation stage (or partial operation stage) and covered the years 2019-21. It included direct investments (via equity, debt or guarantees) but did not include investments via financial intermediaries.

Our analysis considered:

- Vulnerability of sector. PIDG assessed the vulnerability of each investment based on sector vulnerabilities published by Moody's[16] combined with internal expert knowledge on the geographies that PIDG operates in.
- Exposure: this was based on financial exposure at year-end (i.e. amount of debt outstanding, equity investment, guarantee outstanding).

Results

Based on 3 years of data available, the analysis shows:

- a trend of decreasing exposure in sectors considered to have high potential transition risks
- increasing exposure in sectors considered to have low transition risks and/ or are climate opportunities. In 2021 this category accounted for over 50% of the entire PIDG portfolio analysed.

PIDG Overall		2019		2020		2021	
Sectors	**Risk**	**Exposure (mUSD)**	**% total exposure**	**Exposure (mUSD)**	**% total exposure**	**Exposure (mUSD)**	**% total exposure**
Total exposure in high risk sectors		**273**	**36%**	**295**	**38%**	**225**	**28%**
Power generation – oil	High	54	7%	51	7%	37	5%
Power generation – gas	High	130	17%	123	16%	108	13%
Oil processing, transportation and storage	High	15	2%	11	1%	7	1%
Gas processing, transportation and storage	High	17	2%	16	2%	15	2%
Transport – air	High	4	1%	25	3%	28	3%
Transport – rail	High	0	0%	27	3%	0	0%
Transport – ICE road	High	15	2%	5	1%	0	0%
Manufacturing – steel	High	13	2%	30	4%	30	4%
Manufacturing – chemicals	High	25	3%	7	1%	0	0%
Total exposure in moderate risk sectors		**159**	**21%**	**117**	**14%**	**148**	**18%**
Manufacturing – cement	Moderate	28	4%	16	2%	0	0%
Manufacturing – other	Moderate	43	5%	43	5%	27	3%
Transport – ports, ferry	Moderate	55	7%	58	7%	54	7%
Mining	Moderate	28	4%	0	0%	67	8%
Agri-infrastructure (not resilience solutions)	Moderate	5	1%	0	0%	0	0%
Total exposure in low risk sectors	**Low**	**352**	**43%**	**371**	**48%**	**431**	**54%**
Telecoms	Low	39	5%	34	4%	107	13%
Housing / construction	Low	42	5%	48	6%	45	6%
Water, Sewage and Sanitation	Low / opportunity	1	0%	0	0%	19	2%
Power generation – renewables	Low / opportunity	213	26%	235	31%	214	27%
Power generation – T&D	Low / opportunity	55	7%	52	7%	39	5%
Agri-infrastructure (irrigation)	Low / opportunity	2	0%	2	0%	2	0%
Transport – EV road	Low / opportunity	0	0%	0	0%	5	1%

16. Moody's Investors Service, "Heat map: Sectors with $3.4 trillion in debt face heightened environmental credit risk", December 2020

Next steps

Following this initial assessment and in parallel with our work on risk screening for new potential investments, our next steps include:

- Extension of review to investments via financial intermediaries
- Consideration of further revisions to the PIDG Climate Standard to further reduce transition risks for new investments.

4.3 Physical Risks

Our approach

An assessment of exposure of the existing portfolio to physical climate risks was undertaken over the past year. The scope of the assessment included investments that had reached operation stage or partial operation stage at 2021 year-end and included fixed assets where geographic co-ordinates could be provided.

We did not therefore include projects that, for example, involved internet cables, telco towers, T&D infrastructure. We also did not include financial intermediaries. Where one investment covered several sites, exposure was split on a pro-rata basis between the sites.

Based on the definition of climate risk from the IPCC[17]:
Risk = hazard x exposure x vulnerability

PIDG considered:

- Hazards: based on geographic co-ordinates of assets, PIDG used data provided by Moody's to identify six potential climate hazards, namely floods, heat stress, hurricanes and typhoons, sea level rise, water stress and wildfire.

  Climate modelling uses different scenarios based on different levels of GHG emissions. Some of the most commonly used are the Representative Concentration Pathways (RCPs) used in the IPCC 5th Assessment Report. Four scenarios were developed RCP8.5 (high emissions scenario); RCP6.0 and RCP4.5 (medium stabilisation scenarios); RCP2.5 (low emissions scenario)[18].

  According to analysis by Moody's, climate models only show meaningful differences between RCP scenarios after 2040; in other words, we are 'locked into' a certain amount of climate change for the next 15-20 years. Moody's application therefore compares changes in temperature and weather between historical conditions (1975-2005) and predicted future conditions (2030-2040), using the RCP 8.5 (business-as-usual) scenario. A score is provided for each asset (from 1-100) which is further categorised into risk level: none, low, medium, high and red flag.

- Vulnerability of sector. PIDG assessed the vulnerability of each investment based on four indicators[19], designed to capture the ways in which climate hazards could impact on investment performance. Each investment was assigned red-flag, high, medium or low, depending on a qualitative assessment of impact on the investment:
  - Dependency of project operation/outputs on natural resources and weather (including water availability)
  - Climate sensitivity of market demand for project/ project outputs
  - Vulnerability of supply chain; reliance on secure transport routes and secure energy supply
  - Reliance on labour for project operation

  Results from this assessment were compared with sector vulnerabilities published by Moody's[20] and UNEP FI[21] and found to be broadly comparable.

- Exposure: this was based on financial exposure at 2021 year-end (i.e. amount of debt outstanding, equity investment, guarantee outstanding).

17. 1 - Climate Change: New Dimensions in Disaster Risk, Exposure, Vulnerability, and Resilience (ipcc.ch)
18. Explainer: The high-emissions 'RCP8.5' global warming scenario (carbonbrief.org)
19. Adapted from UNEP FI, Charting a New Climate, 2020 and finance-for-a-climate-resilient-future-2.pdf (citigroup.com)
20. Moody's Investors Service, "Heat map: Sectors with $3.4 trillion in debt face heightened environmental credit risk", December 2020
21. UNEP FI, Charting a New Climate, 2020

Results

Hazards: There was at least one hazard deemed 'red-flag' or 'high' risk[22] at the location of **all** PIDG deals included in the analysis (apart from one EAIF investment), refer to the figure below.

PIDG exposure (nUSD)				
Hazard	**Low**	**Moderate**	**High**	**Red flag**
Floods	222	114	26	175
Heat stress	2	140	312	83
Hurricanes and typhoons	27	89	0	6
Sea level rise	48	78	0	65
Water stress	240	206	57	34
Wildfire	15	276	247	0

PIDG exposure (% of total)				
Hazard	**Low**	**Moderate**	**High**	**Red flag**
Floods	24%	12%	3%	19%
Heat stress	0%	15%	34%	9%
Hurricanes and typhoons	3%	10%	0%	1%
Sea level rise	5%	8%	0%	7%
Water stress	26%	22%	6%	4%
Wildfire	2%	30%	27%	0%

Figure 4: PIDG exposure to climate hazards

Vulnerability: of the investments included in the analysis, **all** were in sectors considered either moderately vulnerable or highly vulnerable to the impacts of climate change, refer to the figure below.

Sectors	**PIDG Total Exposure (mUSD)**	**Vunerability**
Power generation – thermal	137	High
Power generation – hydro	39	High
Power generation – PV	84	Moderate
Power generation – biomass	28	High
Gas pipelines, transportation and storage	15	Moderate
Oil refining	7	High
Transport – ports, ferry	51	High
Transport – airports	28	Moderate
Manufacturing – steel	30	Moderate
Manufacturing – cement	0	Moderate
Manufacturing – chemicals	0	Moderate
Manufacturing – other	27	High
Housing	40	Moderate
Agri-infrastructure	2	High
Mining	30	High
Water, Sewerage and Sanitation	19	High
not included	**385**	
Total	**922**	
Red-flag	0	0%
High vunerability	339	37%
Moderate vunerability	198	21%
Low vunerability	0	0%
Not included	385	42%
	922	**100%**

Figure 5: PIDG exposure by sector and their vulnerabiliy to climate change[23]

Next steps

Following this initial assessment and in parallel with our work on risk screening for new potential investments, our next steps include:

- Extension of review to all other projects that have reached financial close
- Development of methodology for overall physical climate risk score based on hazard exposure and sector vulnerability
- Development of methodology for adjusted physical climate risk score based on climate risk management by sponsors
- Inclusion of temporal aspects into overall methodology (as well as hazard exposure and sector vulnerability considered currently)
- Development of guidance to support PIDG company work with sponsors to reduce and manage identified climate risks.
- Continued work to include system resilience in our physical climate risk assessment.

22. Based on the Moody's methodology, high risk is defined as "exposed today and exposure level is increasing" and red flag is defined as "Highly exposed to historical and/ or projected risks, indicating high potential for negative impacts".

23. Note 'not included' figure includes investments where geographic co-ordinates were not available including projects that, for example, involved internet cables, telco towers, T&D infrastructure. We also did not include financial intermediaries.

Appendix 1: Alignment with PCAF Standard

This appendix gives more detail as to how PIDG has reported financed emissions in line with the PCAF Standard, in particular chapter 6 of the Standard, reporting recommendations and requirements. Note, we have calculated and checked the financed emissions in-house. These have not been validated externally but we will consider this in future years.

PCAF reporting recommendations and requirements	PIDG alignment
Report using the operational or financial control consolidation approach	PIDG has calculated financed emissions for all investments by PIDG companies as scope 3 category 15 emissions.
Overall Reporting Requirements and Recommendations	- Principles: Our GHG accounting and reporting is based on the principles of relevance, completeness, consistency, transparency, and accuracy. - Purpose: Our reporting aligns with our business goals i.e. for identifying and managing climate-related transition risks and as a starting point for developing an emissions reduction trajectory. - Frequency: Financed emissions were calculated at a fixed point in time, namely 31 December 2020 and 2021, in line with the financial reporting cycle. - Recalculation and significance threshold: we have not yet established a baseline recalculation policy as, to date, no events (i.e. structural changes to the organisation) have occurred that would trigger the need to recalculate the baseline. - Form of reporting: this report is made available on our website. - Past performance: This report discloses financed emissions for 2019-21.
Coverage	Financed emissions were calculated for all investments and investment types made by PIDG, namely debt (EAIF), equity (InfraCo Asia and InfraCo Africa) and guarantees (GuarantCo) that have reached operation stage. Note while under the PCAF methodology, emissions from guarantees are only included when the guarantee is called and converts to a loan. PIDG wants to recognise the emissions from all guarantees so all are included here, whether the guarantee has been called or not, aware that we are mostly guarantying local banks that might not be reporting to TFCD recommendations. Note PIDG does make some investments via financial intermediaries. These are not currently included in our GHG calculations as the PCAF methodology does not include this type of investment in the current version of the Standard.
Gases and units	PIDG GHG calculations accounted for all 7 GHGs under the Kyoto protocol, which were converted to tonnes of carbon dioxide equivalent.
Absolute emissions	- PIDG GHG financed emission calculations include combined scope 1 and 2 emissions of each investment. Figures are disaggregated at the PIDG company level which is equivalent to the asset level. - This report also includes emissions associated with PIDG operations i.e. scope 1 and 2 emissions and scope 3 emissions associated with business travel. - PIDG includes scope 3 emissions of investments where they are likely to be significant. At this stage, we have included scope 3 emissions from oil and gas infrastructure and processing, as well as from vehicles using roads infrastructure. - In some InfraCo investments, PIDG is the initial sponsor of a project. Lifetime emissions of these projects have not been reported here but this is something that will be included in future reporting.

Avoided emissions and emission removals	PIDG has included avoided emission calculations for grid connected renewable energy projects. These figures are reported separately from absolute emissions.
Emissions intensity	PIDG has not reported emission intensity of investments or of the portfolio at this stage, although it is something that may be reported on in future years.
Data quality	- This report presents the most recent data available i.e. as at 31 December 2021. In cases where data for 2021 was not available, data from an earlier year was used. - Data has been verified internally; external data verification is under consideration for future years. - Data quality has improved annually; the majority of investments now have a score of 2a i.e. outstanding amount in the project and total project equity plus debt are known. Project emissions are not known but calculated using primary physical activity data for the project's energy consumption and emission factors specific to that primary data. Relevant process emissions are added. A weighted data score has not yet been included but this will be added in future years. We also give further information in the table below.

Description of types and sources of data

Activity data	Given the markets that PIDG operates in, GHG emissions are not typically reported by investee companies. At the end of each financial year therefore, PIDG asks for data needed for GHG calculations as part of its annual impact reporting. Data points requested are: - Activity data (e.g. MWh power generated, tonnes cement produced) - Energy consumption data (e.g. MWh power consumed from grid, tonnes of HFO burned) - GHG calculations (if available)
Assumptions	In cases where activity data is not provided by clients, PIDG will follow the following hierarchy: - use data from the last year that data was available - use ex ante estimates from the time of the investment decision - estimate GHGs based on assumptions from a credible source, including the PCAF database, UNFCCC CDM methodologies, EIB carbon footprinting methodology
Emission factors	For calculating GHGs, PIDG typically uses emission factors from: - IPCC Guidelines for National GHG Inventories - GHG conversion factors published annually by the UK government For calculating emission reductions, PIDG uses grid emission factors published by the UNFCCC IFI TWG.
Attribution factor calculation	- For project finance deals, PIDG uses data on outstanding amount (at end of financial year, either debt or equity) and total project cost (at financial close). - For business loans and unlisted equity, data was requested from investee companies on EVIC (for listed companies) or total debt+equity (for unlisted companies) as at year end. If this wasn't available, data from the most recent year it was available was used.

24. EIB Project Carbon Footprint Methodologies