

# Green Finance Impact Report 2023





## Introduction

Macquarie Group Limited (“Macquarie” or “MGL”) is pleased to present its Green Finance Impact Report for the 12 months to 31 March 2023.

This report relates to the MGL 2021 £900 million Sterling and 2020 \$US300 million Samurai loan facilities, of which £250 million and \$US150 million constitutes green financing (“green tranches”) respectively as at 31 March 2023. It provides information on the environmental benefits (“green impact”) of the eligible projects<sup>1</sup> which have been notionally allocated<sup>2</sup> green tranche financing.

The approach presented in this report is consistent with Macquarie’s Green Finance Framework (“GFF”) which was developed in accordance with the APLMA<sup>3</sup> Green Loan Principles. Macquarie has utilised the expertise of its Green Investment Group (“GIG”) Green Analytics Team to demonstrate the green impact of its eligible projects. The full Impact Report is available in Appendix 1.

GIG is Macquarie Asset Management’s specialist green investment team, and a global leader in the development of companies, assets and technologies that aim to accelerate the global transition to net zero.

<sup>1</sup> See glossary for definition of eligible project.

<sup>2</sup> See glossary for definition of notional.

<sup>3</sup> Asia Pacific Loan Market Association.



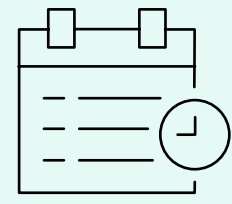
Formosa 2 Offshore wind farm

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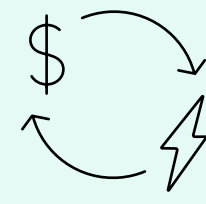
# Key highlights on Macquarie's green financing



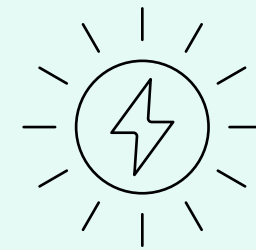
**Sixteen individual projects** across Australia, Europe, and Asia were allocated green financing



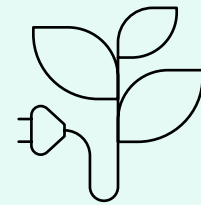
The Green Finance Framework has been developed in accordance with the **APLMA Green Loan Principles**



**A\$0.7b<sup>4</sup>** equivalent of green financing drawn at 31 March 2023 from **24 financiers** across the globe



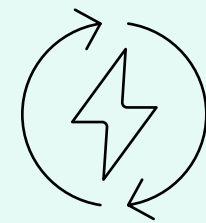
GIG Carbon Score: **2,654 AA<sup>5</sup>**



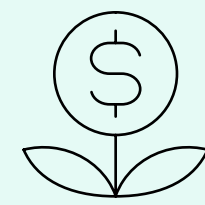
The portfolio is forecast to produce over **6,300 GWh** per year, enough to power the equivalent of over **~1.6 million households<sup>6,7</sup>**



The portfolio<sup>7</sup> is forecast to avoid greenhouse gas emissions of 2,654 kt CO<sub>2</sub>e per year, equivalent to taking over **~880,000 cars** off the road<sup>8</sup>



Finance was allocated to eligible projects in development, construction, or operations with renewable energy generation capacity of over **1,828 MW**



Reasonable assurance provided by PwC over **Macquarie's compliance** with the Green Finance Framework



📷 East Anglia ONE offshore wind farm

<sup>4</sup> £250 million and \$US150 million converted to AUD at March 31st 2023 FX rates.

<sup>5</sup> For renewable energy projects, the GIG Carbon Score is a measure of a project's lifecycle GHG emissions compared to the emissions of energy taken from the local grid, where 2,654 comprises the forecasted kt CO<sub>2</sub>e avoided per year of the assets which have received funds; and the AA is the Carbon rating, which is a measure of a project's lifecycle greenhouse gas emissions compared to the emissions of the counterfactual. Projects with the lowest lifecycle emissions relative to the counterfactual would score the highest ratings from AAA to B.

<sup>6</sup> Home powered equivalents statement provided by Green Investment Group calculated using country specific average electricity consumption per electrified household 2020 data.

<sup>7</sup> The portfolio refers to the sixteen eligible projects which were allocated green financing throughout the reporting period (refer to Appendix 1). Forecasts are based on a whole project basis, i.e. 100% of the total Green Impact derived from the projects that have been notionally allocated green tranche financing, irrespective of the portion of the year for which financing has been allocated.

<sup>8</sup> Calculated using a petrol car based on data from UK Government Greenhouse gas reporting conversion factors. See [www.gov.uk/government/collections/government-conversion-factors-for-company-reporting](https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting) for further detail.





# Summary of green metrics

Throughout the reporting period sixteen projects were allocated funding from the green tranches, delivering a significant green impact and achieving a Carbon Score of 2,654 AA.

## Throughout this report the green impact and associated metrics:

1. incorporate all the eligible projects which have been notionally allocated green tranche financing from 1 April 2022 to 31 March 2023 (the “portfolio”). This is in line with the APLMA Green Loan Principles and allows full transparency and disclosure of each project that has been supported by the green tranches.
2. reflect the total green impact derived from 100% of those projects that have been notionally allocated green tranche financing, irrespective of the portion of the year for which financing has been allocated. This approach has been adopted, as the GFF’s ‘Management of proceeds’ described on page 9 does not support proportional allocation due to the revolving allocation of the use of proceeds (i.e. as above, projects may not necessarily be supported by the facility for the entire reporting period).

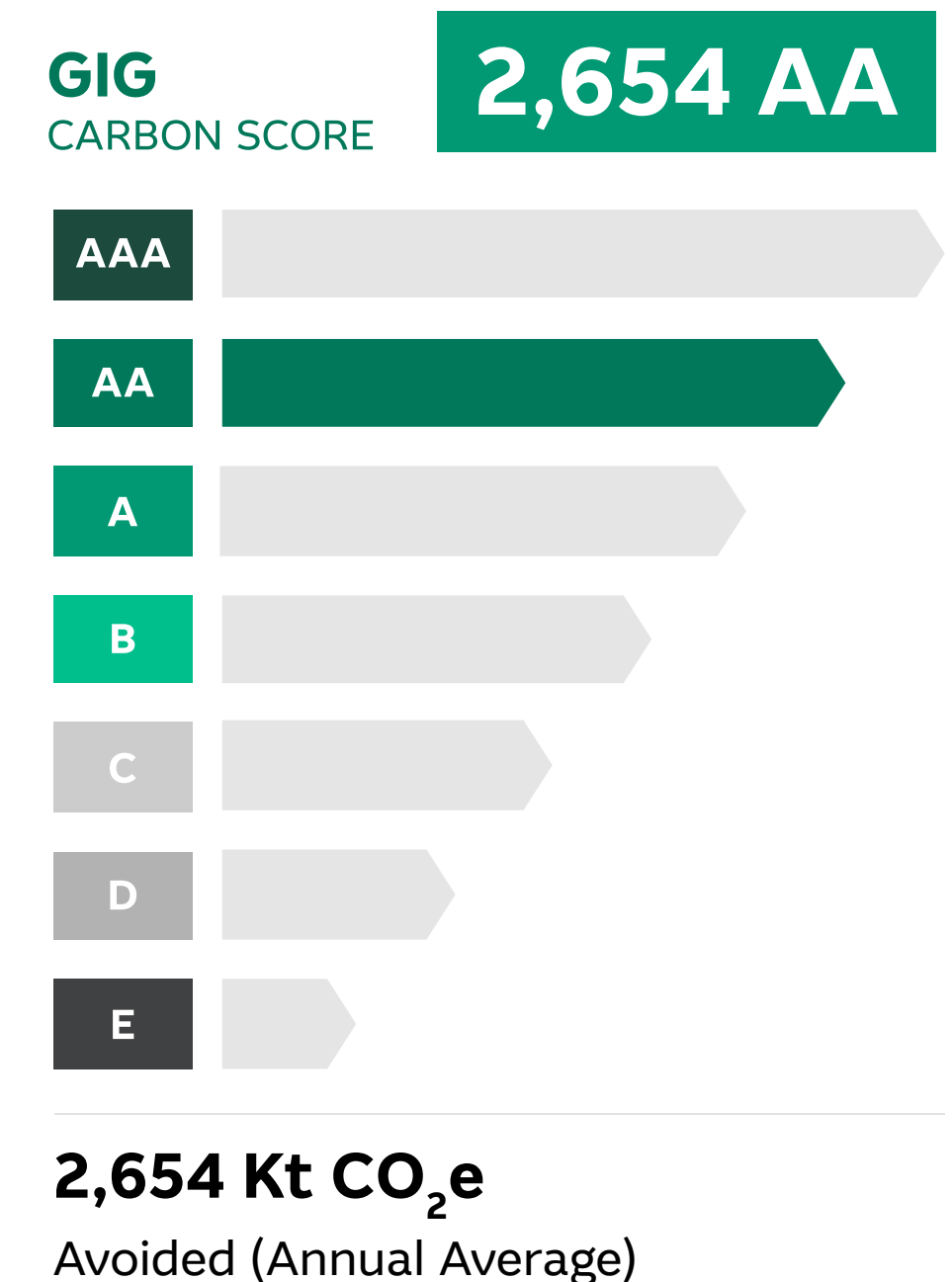
## GIG Carbon Score

The GIG Carbon Score is GIG’s standard for communicating the impact of low carbon infrastructure in helping to reduce greenhouse gas emissions. While other measures of GHG emissions only consider the emissions produced during a project’s operational phase, the GIG Carbon Score also considers the emissions across the project’s entire lifecycle.

The rating shows the aggregated GIG Carbon Score for Macquarie’s green tranches is 2,654 AA. The rating of AA reflects the low lifecycle carbon intensity of the solar PV and wind power projects notionally allocated funding, and the mix of project locations in lower carbon intensive grids (e.g. UK and Sweden) and higher carbon grids (e.g. Taiwan, India and Poland). Projects located in countries with higher carbon intensive grids achieve higher ratings, reflective of their potential to displace more polluting generation.

The GIG Carbon Score also shows the quantified greenhouse gas emissions avoided 2,654 kt CO<sub>2</sub>e/ yr, which indicates the portfolio lifecycle emissions avoided relative to the counterfactual (a scenario in which the projects were not built).<sup>9</sup> This globally applicable approach allows investors to compare the relative performance of projects using an emissions avoided measure.

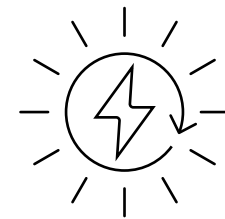
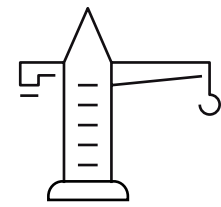
Full details of the GIG Carbon Score methodology is provided within the Green Impact Report in Appendix 2.



<sup>9</sup> For renewable energy projects, the GIG Carbon Score is a measure of a project’s lifecycle GHG emissions compared to the emissions of energy taken from the local grid.



# Portfolio renewable energy capacity

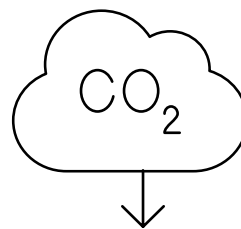
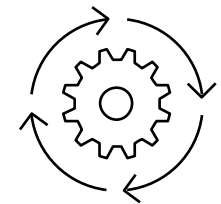


**430 MW**

of renewable energy in construction

**1,398 MW**

of renewable energy in operation



The portfolio is forecast to produce over

**6,300 GWh**

per year, enough to power the equivalent of over **1.6 million households**<sup>10</sup>

The portfolio is forecast to avoid greenhouse gas emissions of

**2,654 kt CO<sub>2</sub>e**

per year, equivalent to taking over **880,000 cars off the road**<sup>11</sup>

East Anglia ONE offshore wind farm



<sup>10</sup> Home powered equivalents statement provided by Green Investment Group calculated using country specific average electricity consumption per electrified household 2020 data.

<sup>11</sup> Calculated using a petrol car based on data from UK Government Greenhouse gas reporting conversion factors. See <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting> for further detail.





# Macquarie's green financing transactions

Climate change and the associated legislative and regulatory responses present significant challenges for society and the global economy. Green financing has an important role to play in supporting the global energy transition, and investor appetite for these products is rising.

In June 2018, Macquarie issued a £2,100 million loan facility of which £500 million constituted green financing. £250 million of green financing was returned to lenders in April 2020 upon prepayment of the 3yr tranches of this facility. The 5yr tranches of the 2018 facility were refinanced in October 2021 for £900 million, retaining £250 million in green financing. In March 2020, Macquarie issued its second green financing facility, a \$US300 million facility into the Japanese market. Of this, \$US150 million constitutes as green financing.

The green tranches were issued in accordance with Macquarie's GFF. The GFF was established to demonstrate how Macquarie and its entities intend to enter into green financing transactions<sup>12</sup> to fund projects that will deliver environmental benefits to support Macquarie's business strategy.

<sup>12</sup> See glossary for definition of green financing transactions.

The details of Macquarie's green tranches are as below:

	Macquarie GBP Facility	Macquarie USD Samurai Facility
Tranche	Tranche A	Tranche A
Issuer	Macquarie Group Limited	Macquarie Group Limited
Issue Date	27 October 2021	30 March 2020
Original Maturity Date	1 April 2027	30 March 2025
Prepayment Date	-	-
Original Tenor	5.5 years	5 years
Total Volume	£250m	\$US150m
Structure	Term	Term
Initial Drawdown Date	29 October 2021	9 April 2020
Drawn Volume as at 31 March 2023	£250m	\$US150m
Use of Proceeds	In accordance with Macquarie's Green Finance Framework	In accordance with Macquarie's Green Finance Framework

**For the reporting period April 2022 to March 2023:**


- MGL 2021 GBP Facility Tranche A was drawn down and allocated throughout the entire reporting period.
- MGL 2020 Samurai USD Facility Tranche A was drawn down and allocated throughout the entire reporting period.

**The eligible projects which have been notionally allocated funding from the green tranches during the reporting period are summarised in the following table.**

Formosa 2 piles arrival





 East Anglia ONE offshore wind farm

Eligible projects	Location	Technology	Stage	Percentage of Macquarie Funding <sup>13</sup>	Total Capacity (MW)	Total GHG emissions avoided (kt CO <sub>2</sub> e/yr)
East Anglia ONE	UK	Offshore Wind	Operational	12%	714	1084
Formosa 1	Taiwan	Offshore Wind	Operational	50% <sup>14</sup>	128	211
Formosa 2	Taiwan	Offshore Wind	Construction	75%	376	553
Lal Lal Wind Farm	Australia	Onshore Wind	Operational	20% <sup>14</sup>	228	412
Tysvaer	Norway	Onshore Wind	Operational	100% <sup>14</sup>	47	5
Buheii	Norway	Onshore Wind	Operational	100% <sup>14</sup>	80	10
Hornamossen	Sweden	Onshore Wind	Operational	100% <sup>14</sup>	43	6
Jozwin	Poland	Onshore Wind	Operational	100% <sup>14</sup>	25	42
Kaomatikuntla - 01 (Vibrant Energy)	India	Solar PV	Operational	74%	11	17
Kaomatikuntla - 02 (Vibrant Energy)	India	Solar PV	Operational	74%	14	19
Palamakulla (Vibrant Energy)	India	Solar PV	Operational	74%	9	14
Tanakallu - 01 (Vibrant Energy)	India	Solar PV	Operational	74%	12	16
Tanakallu - 02 (Vibrant Energy)	India	Solar PV	Operational	74%	9	15
Telcontar (Vibrant Energy)	India	Solar PV	Operational	21%	67	89
VEH Srishti (Vibrant Energy)	India	Onshore Wind	Construction	27%	54	148
Vizianagaram (Vibrant Energy)	India	Solar PV	Operational	74%	10	13
<b>Total</b>					<b>1,828</b>	<b>2,654</b>

<sup>13</sup> Reflects the share of the projects funded by Macquarie green financing at the time of allocation.

<sup>14</sup> Macquarie's interests in Formosa 1, Lal Lal Wind Farm, Tysvaer, Buheii, Hornamossen and Jozwin were divested during the 2023 financial year.





## Approach

The GFF, under which the green tranches were issued, was developed in accordance with the APLMA Green Loan Principles, February 2021. It was supported by a second opinion external review by Sustainalytics and was noted to be credible and impactful.<sup>15</sup>

### The framework is based on four core components:

1. Use of proceeds
2. Process for project evaluation and selection
3. Management of proceeds
4. Reporting

#### Use of proceeds

Under the GFF, the use of proceeds of each green financing transaction is notionally allocated against the financing or re-financing of eligible projects which provide clear environmental benefits.

The GFF explicitly recognises several broad categories of eligibility for projects with the objective of addressing key areas of environmental concern such as climate change, natural resources depletion, loss of biodiversity, and air, water and soil pollution.

The proceeds from the green tranches were applied towards financing offshore wind, onshore wind and solar development projects across the globe in FY23. Going forward, we may extend the use of loan proceeds to support further renewable energy, energy efficiency, waste management, green buildings and clean transportation projects.

Activities and lending to an industry or technology which directly involves fossil fuels, nuclear or biomass suitable for food production are specifically excluded under the GFF.

### Process for project evaluation and selection

Macquarie has established a Green Finance Working Group (“GFWG”) which has responsibility for governing and implementing the GFF. The GFWG currently comprises representatives from Macquarie’s Environmental and Social Risk (“ESR”) team and the GIG Green Analytics team who hold the in-house environmental expertise, as well as representatives from Risk Management Group - Credit, Financial Management Group - Group Treasury and Macquarie’s Operating Groups.

Business units will identify potential eligible projects based on the criteria in the GFF’s use of proceeds. Potential eligible projects are submitted to the GFWG for review and confirmation that they qualify under the GFF. This includes the preparation of a suitable Green Opinion<sup>16</sup> provided by the GIG Green Analytics team where appropriate.

The Green Analytics team is responsible for confirming that the projects:

- fall within one of the eligible project categories defined in the GFF
- are anticipated to provide clear environmental sustainability and/or climate change mitigation benefits in terms of the contribution to one or more of GIG’s Green Purposes<sup>17</sup>.

In addition to meeting the green loan eligibility criteria, all projects are assessed under Macquarie’s group wide ESR policy and ESR assessment tool during the investment decision process.

The ESR policy and tool provide a robust due diligence process and evaluate ESR issues including labour and employment practices, climate change, human rights, resource efficiency, pollution prevention, biodiversity and cultural heritage. The approach is based on international guidelines including the International Finance Corporation Performance Standards.

📷 Vizianagaram Solar Power Plant



<sup>15</sup> Sustainalytics opinion is available from <https://www.macquarie.com/assets/macq/investor/debt-investors/macquarie-green-finance-second-party-opinion.pdf>

<sup>16</sup> Green Opinion is an opinion provided by the Green Analytics Team on the prospective transaction. It includes information on the anticipated environmental sustainability and/ or climate change mitigation benefits of the projects to be financed by the transaction and will be a requirement for any transaction included in the eligible projects’ portfolio.

<sup>17</sup> As listed in GIG’s Green Investment Principles, available from [www.greeninvestmentgroup.com/green-impact](http://www.greeninvestmentgroup.com/green-impact).



## Management of proceeds

The proceeds of the green tranches have not been credited to a dedicated account and are rather deposited in Macquarie's general funding accounts.

We have developed an internal governance process to notionally allocate proceeds against eligible projects in an appropriate manner (as required in the APLMA Green Loan Principles). Through the GFWG, Macquarie maintains a register of green financing transactions and eligible projects and has implemented a monitoring and reporting process to ensure that:

- the total funding required<sup>18</sup> for eligible projects is greater than the outstanding principal amounts due on green financing transactions
- eligible projects are owned within the consolidated entity<sup>19</sup> which raises the green financing transaction that is notionally allocated against the eligible projects
- eligible projects do not have other financing (a) secured<sup>20</sup> against them, or (b) attributable to them in respect of another 'use of proceeds' obligation.

<sup>18</sup> This is calculated as the legal commitment Macquarie has agreed to invest in an eligible project as reflected in contractual arrangements entered into by Macquarie, irrespective of whether the commitment is drawn or undrawn. This includes, but is not necessarily limited to, the purchase price for an eligible project, the total committed exposure to an eligible project or an equity contribution to an eligible project.

<sup>19</sup> Macquarie Group Limited and its subsidiaries.

<sup>20</sup> Secured in this instance is defined as projects where external financing is either secured against Macquarie's investment (with no letter of credit in place) or has recourse back to Macquarie.

## Reporting

This report is designed to outline Macquarie's compliance with the GFF and contain information on the allocation reporting and impacts of outstanding green financing transactions.

The report is publicly available on Macquarie's website and will be revised annually.

## Assurance

PwC has been engaged to provide reasonable assurance over Macquarie's compliance with the obligations contained within its GFF.

Claims relating to the green impact estimated in relation to the GFF were outside the scope of PwC's assurance engagement.

 East Anglia ONE offshore wind farm






## Green impact

Macquarie has utilised the expertise of the GIG Green Analytics team to demonstrate the green impact of the proceeds from the green tranches.

In line with the APLMA Green Loan Principles, the green impact has been calculated for all the projects to which proceeds have been notionally allocated green tranche financing from 1 April 2022 to 31 March 2023. This allows full transparency and disclosure of each green project that has been supported by the GFF. The full Impact Report is available in Appendix 1.



 East Anglia ONE offshore wind farm





Thanakallu (T1) Solar Plant

### Forecasted green impact of eligible projects<sup>21</sup>

#### GHG emissions avoided (carbon dioxide equivalent)

Average annual	2,654	kt CO <sub>2</sub> e / yr
Remaining lifetime	64,023	kt CO <sub>2</sub> e

#### Other emissions to air avoided (oxides of nitrogen)

Average annual	4,276	t NO <sub>x</sub> / yr
Remaining lifetime	109,012	t NO <sub>x</sub>

#### Fossil fuels consumption avoided (oil equivalent)

Average annual	1,228	kt oe / yr
Remaining lifetime	29,230	kt oe

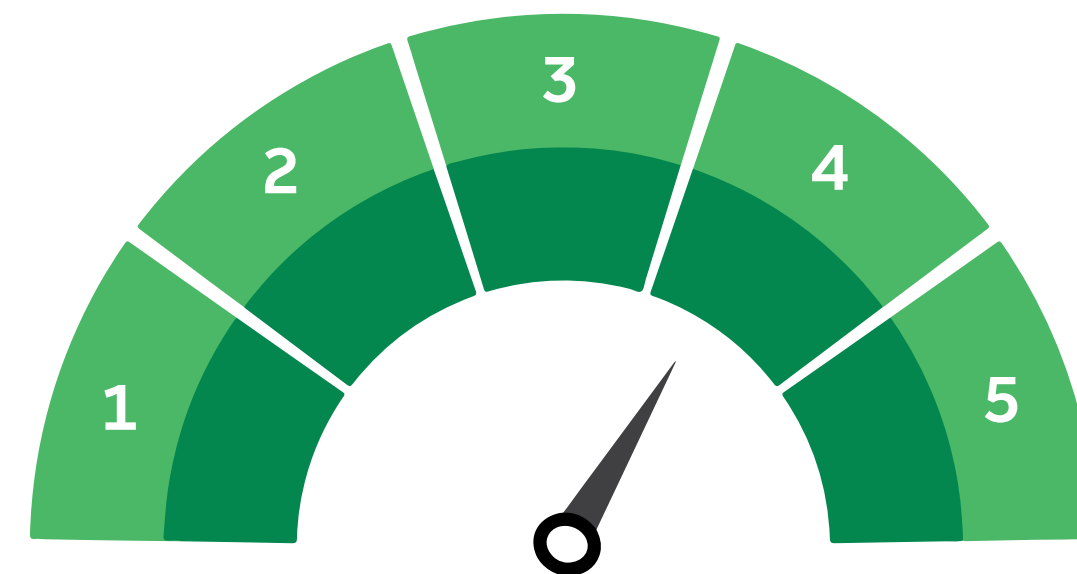
### Green impact forecast accuracy

Green impact forecast accuracy is an assessment of the level of confidence that can reasonably be placed on the accuracy of any quantified green impact forecast. GIG has assessed the weighted average green impact forecast accuracy for the portfolio at Level 4 (High). The forecasts and green impact forecast accuracy are subject to the methodology, assumptions, limitations and methods set out in Appendix 2.

The majority of the projects within the portfolio are operational and as such, their forecasted performance is based on actual performance of the assets.

This results in a Level 4 (High) green impact forecast accuracy, as opposed to FY2022, where many of the projects were still in construction resulting in a forecast accuracy level of 3 (good).

#### Level 4 (High)



### The GIG Green Impact Report

The GIG Green Impact Report (Appendix A), which uses GIG’s robust green impact methodology, provides green impact performance disclosure. The report has unique features developed using GIG’s proprietary methodology and shows quantified, globally comparable green performance data for a project or portfolio including:

- greenhouse gas emissions avoided, calculated according to the internationally harmonised approach for greenhouse gas accounting<sup>22</sup>
- metrics for avoided fossil fuel consumption (tonnes of oil equivalent), air pollutant emissions (nitrous oxides, oxides of sulphur, particulate matter), and, where applicable, waste to landfill avoided and materials recycled and recovered
- a measure of accuracy of the forecast green impact, derived from project technology type, stage of project development, location of the project/ country governance, and input data quality
- the direct, or indirect performance of the portfolio or project against the UN Sustainability Development Goals and their associated targets.

<sup>22</sup> The GHG Protocol for Project Accounting - [www.ghgprotocol.org/standards/project-protocol](http://www.ghgprotocol.org/standards/project-protocol).

<sup>21</sup> The forecasts are based on the total green impact derived from 100% of those projects that have been notionally allocated green tranche financing, and not just the proportional impact of the green tranches, irrespective of the portion of the year for which financing has been allocated.





## Macquarie's green capabilities and commitments

Macquarie is a global financial services group operating in 34 markets across asset management, retail and business banking, wealth management, leasing and asset financing, market access, commodity trading, renewables development, specialist advice, access to capital and principal investment.

For two decades, we have used our deep capabilities in energy, infrastructure, transportation, technology, agriculture and commodities to work with clients to deliver practical solutions. Macquarie continues to support clients seeking to manage and respond to sustainability challenges and capitalise on emerging opportunities. Drawing on our global network, sector expertise and strong record, Macquarie provides a diverse range of products and services with an ESG focus to corporate, government and institutional clients. Our activities span the investment cycle from research on alternative energy to tailored capital solutions for the development and construction of renewable assets and social infrastructure. Given the scale of the needed transition, we recognise that much of the world will depend on oil/gas for years to come. As such, we will continue to support clients in these sectors to help them decarbonise and reduce the emissions intensity of their activities.

<sup>23</sup> This refers to on-balance sheet lending and equity investment activities, excluding on-balance sheet securities held for client facilitation and market making purposes (as opposed to held for investment). Lending refers to loan assets held at amortised cost and excludes certain items such as leasing, asset finance, trading assets and short term financing (e.g. inventory finance). For motor vehicles, we have also included novated leases, given availability of both methodology and data.

<sup>24</sup> In our managed portfolios of public securities, and alternative investments where MAM does not have significant influence, including certain listed equity, fixed income, multi-asset, and private credit portfolios, we will support the goals of the Paris Agreement in a manner consistent with our client-guided fiduciary and regulatory responsibilities.

<sup>25</sup> The percentage of MAM's in-scope infrastructure and agriculture portfolio companies with Board-approved net zero plans is calculated based on the number of portfolio companies (a) that were in MAM's portfolio at the time of its net zero commitment in December 2020 and (b) where MAM exercises control or significant influence.

<sup>26</sup> This includes (a) the remaining ~15% of MAM's in-scope infrastructure and agriculture portfolio companies where MAM exercises control or significant influence, and (b) properties in our real estate Opportunistic business (where we



📷 Komatikuntla (K1) Solar Plant

### Our climate strategy

In 2021, Macquarie committed to aligning our financing activity with the global goal of net zero emissions by 2050. In line with the Net Zero Banking Alliance (NZBA) Guidelines, these commitments relate to our on-balance sheet lending and equity investment activities.<sup>23</sup>

Macquarie's climate strategy has four central areas of action:

1. Increase our investment in climate mitigation and adaptation solutions
2. Strengthen our support for clients and portfolio companies to help achieve their decarbonisation ambitions
3. Continue to reduce the emissions of our own business operations
4. Align our financing activity with the global goal of net zero emissions by 2050.

We published our first combined Group Net Zero and Climate Risk Report in December 2022.

In addition, Macquarie Asset Management (MAM) has committed to invest and manage its portfolio in line with global net zero by 2040. Practical climate solutions are being driven across MAM's global portfolio where we exercise control or significant influence.<sup>24</sup> As at the end of 2022, almost 85% of MAM's in-scope infrastructure and agriculture portfolio companies had established net zero plans approved by the portfolio boards, and around 400 properties had net zero plans within MAM's Core-Core Plus real estate business.<sup>25</sup> For the remaining assets, MAM is working towards establishing net zero plans over the next 12 months, or within 24 months of acquisition.<sup>26</sup>





In 2022, GIG was moved from Macquarie Capital to MAM with the explicit intent of utilising GIG's asset creation capabilities for the benefit of MAM clients. The combined teams will significantly enhance Macquarie's capacity to mobilise institutional capital for the transition and provide greater scale of decarbonisation solutions for clients, portfolio companies, communities, and the environment.

Macquarie's 2025 Sustainability Plan articulates our corporate sustainability commitments with specific and measurable targets across environmental and social pillars. In FY2023, the Plan was updated to reflect the commitments outlined in Macquarie's Net Zero and Climate Risk Report.

## Our green capabilities

### Financing and developing

- investment in development projects, platforms and businesses
- debt and equity investment
- asset financing, including demand side management, energy efficient assets, distributed generation and battery storage, and electric vehicles

### Advising

- financial advisory
- debt and equity arrangement
- green impact assessment, reporting and ratings

### Managing

- real asset management, including green and social infrastructure, equity and debt, asset finance and real estate
- securities investment management and structured access to funds
- equity-based products and alternative assets

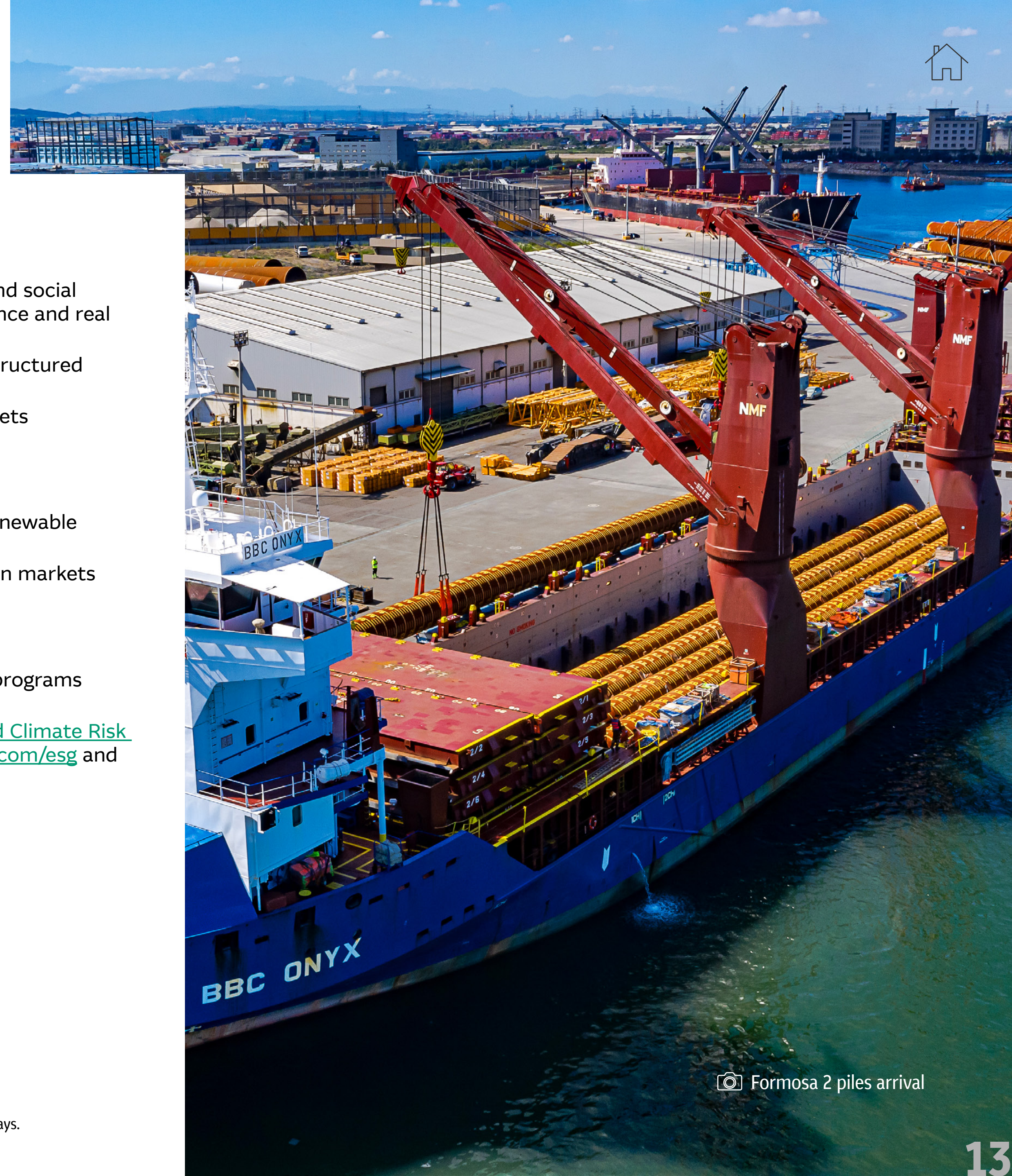
### Trading

- environmental risk management solutions
- access to wholesale energy markets for renewable energy suppliers, retailers and producers
- access to voluntary and compliance carbon markets

### Researching

- specialist ESG and clean energy research
- corporate and investor ESG engagement programs

For more information see [2022 Net Zero and Climate Risk Report](#), [2025 Sustainability Plan](#), [macquarie.com/esg](https://macquarie.com/esg) and the [FY2023 ESG Report](#).



📷 Formosa 2 piles arrival





# Glossary

<b>CO<sub>2</sub>e</b>	Carbon dioxide equivalent; a unit of measurement used to compare emissions from various greenhouse gases relative to their global-warming potential.
<b>Counterfactual</b>	A scenario in which the eligible projects were not built.
<b>Eligible projects</b>	Eligible projects refer to projects which fall within the categories below and which are or have been originated by the various business units of Macquarie. <ul style="list-style-type: none"> <li>• renewable energy</li> <li>• energy efficiency</li> <li>• waste management</li> <li>• green buildings</li> <li>• clean transportation</li> </ul>
<b>ESG</b>	Environmental, Social and Governance
<b>ESR</b>	Environmental and Social Risk
<b>GFF</b>	Macquarie's Green Finance Framework
<b>GFWG</b>	Green Finance Working Group
<b>GHG</b>	Greenhouse Gases
<b>GIG</b>	Green Investment Group
<b>Green finance transactions/ Green financing</b>	These include bonds, loans and other debt or financing structures which support eligible projects, as defined in the GFF.
<b>Green impact</b>	Environmental benefits of the use of proceeds of the green tranches.
<b>Green tranches</b>	The tranches of the 2021 MGL GBP 900 million and 2020 MGL USD 300 million Samurai loan facilities which constitute green financing.  This includes: <ul style="list-style-type: none"> <li>• Tranche A of the 2021 MGL GBP totalling GBP 250 million (Since establishment in 27 October 2021); and</li> <li>• Tranche A of the MGL Samurai Facility totalling USD 150 million.</li> </ul>

<b>Kt</b>	Kilotonne, equal to 1000 metric tonnes.
<b>Legal commitment</b>	The dollar amount Macquarie has agreed to invest in an eligible project as reflected in contractual arrangements, irrespective of whether the commitment is drawn or undrawn. This includes, but is not necessarily limited to, the purchase price for an eligible project, the total committed exposure to an eligible project or an equity contribution to an eligible project.
<b>MAM</b>	Macquarie Asset Management
<b>MW</b>	Megawatt is a unit for measuring electrical power, equal to one million watts
<b>Notional allocation</b>	The allocation of outstanding green financing to eligible projects at any point during the reporting period (not just as at 31 March 2023) irrespective of whether the legal commitment of the eligible project is drawn.  While notional allocations can be made against undrawn funding, we have been careful to allocate against drawn balances only in order to ensure the greatest green impact.
<b>PPAs</b>	Power purchase agreements
<b>SDGs</b>	United Nations Sustainable Development Goals
<b>Reporting period</b>	The period from 1 April 2022 to 31 March 2023





Green  
Investment  
Group

# Appendix A

Green Impact Report:  
Macquarie Sterling and Samurai Loan facilities





# 1. Introduction

The Green Analytics team of Macquarie Asset Management's Green Investment Group ('GIG') has prepared this Green Impact Report (the 'Report') in connection with the Macquarie Group Limited ('MGL') 2021 GBP 900 million Sterling, and 2020 USD 300 million Samurai loan facilities; of which GBP 250 million and USD 150 million constitutes green financing ('green tranches') respectively.

This Report covers those projects (the 'Projects') that were supported by the green tranches between 1 April 2022 and 31 March 2023 (together, the 'Portfolio'). The Green Analytics team has analysed the performance and forecast the Portfolio's avoided greenhouse gas ('GHG') emissions; emissions to air; and fossil fuels consumption (together, the 'Green Impact'), as summarised below. The forecasts are based on the total Green Impact derived from 100% of the Projects that have been notionally allocated green tranche financing, irrespective of the portion of the year for which financing has been allocated. This Report also considers the Portfolio's alignment with the United Nations Sustainable Development Goals.

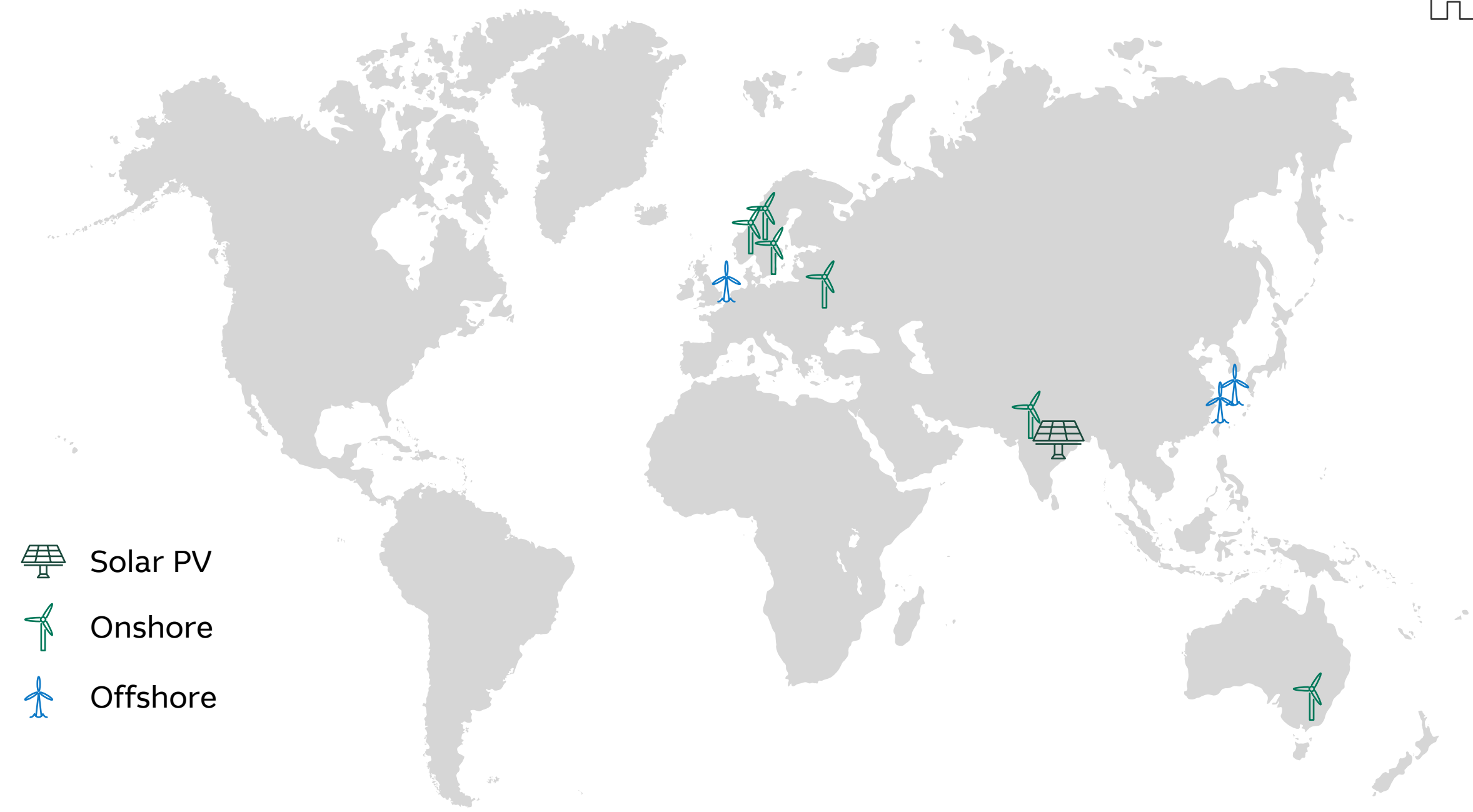
The Portfolio's GIG Carbon Score is 2,654 AA. We have assessed the weighted average Green Impact Forecast Accuracy for the Portfolio at Level 4 (High). Please refer to Appendix 2 for further information on how this is calculated. The Report is aligned with the reporting recommendations in Section 4 of the APLMA Green Loan Principles, February 2021.

### Portfolio information<sup>27</sup>

Operational projects	14
Construction projects	2
Offshore wind capacity (MW)	1,218
Onshore wind capacity (MW)	478
Solar PV (MW)	132

<sup>27</sup> Please see Appendix 1 for further details of the projects within the Portfolio.

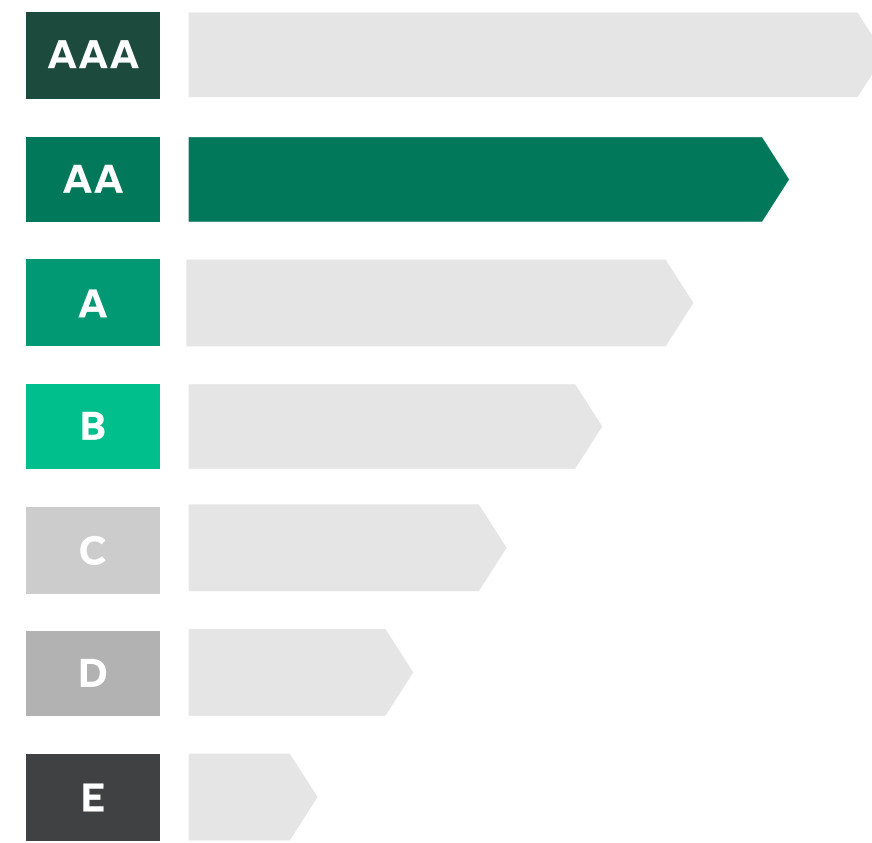
Important note: This Report has been prepared by GIG on the basis of, and should be read in conjunction with, the methodology v1.2, assumptions, limitations and other terms set out in Appendices 2, 3 and the Important Notice and Disclaimer, Appendix 4. This is not a due diligence report and should not be relied upon as such. If appropriate, recipients and users of this Report should conduct their own separate environmental, social and governance enquiries and assessments. This Report is provided for information purposes only and does not constitute and shall not be deemed to be in any way an offer or invitation or solicitation of any offer or invitation to sell or purchase shares or invest in any Project. This Report has not been filed, lodged, registered or approved in any jurisdiction and recipients of this document should keep themselves informed of and comply with and observe all applicable legal and regulatory requirements.



- Solar PV
- Onshore
- Offshore

### GIG CARBON SCORE

**2,654 AA**



**2,654 Kt CO<sub>2</sub>e**  
Avoided (Annual Average)

### Green impact: Forecast performance

#### GHG emissions avoided (carbon dioxide equivalent)

Average annual	2,654	kt CO <sub>2</sub> e / yr
Remaining lifetime	64,023	kt CO <sub>2</sub> e

#### Other emissions to air avoided (oxides of nitrogen)

Average annual	4,276	t NO <sub>x</sub> / yr
Remaining lifetime	109,012	t NO <sub>x</sub>

#### Fossil fuels consumption avoided (oil equivalent)

Average annual	1,228	kt oe / yr
Remaining lifetime	29,230	kt oe





## 2. Green impact forecast

In this Report we use the term ‘Green Impact’ to refer to the GHG, emissions to air and fossil fuels consumption avoided by the Portfolio, as defined in Appendix 2. Forecasts are based on data provided to the Green Analytics team and are subject to our assessment of Green Impact Forecast Accuracy (as set out on page 18). The forecasts and Green Impact Forecast Accuracy are subject to the methodology, assumptions, limitations and methods set out in the Appendices.

### Greenhouse gas emissions avoided

The Portfolio is forecast to avoid over 50 million tonnes CO<sub>2</sub>e over the remaining lifetime of the constituent Projects.

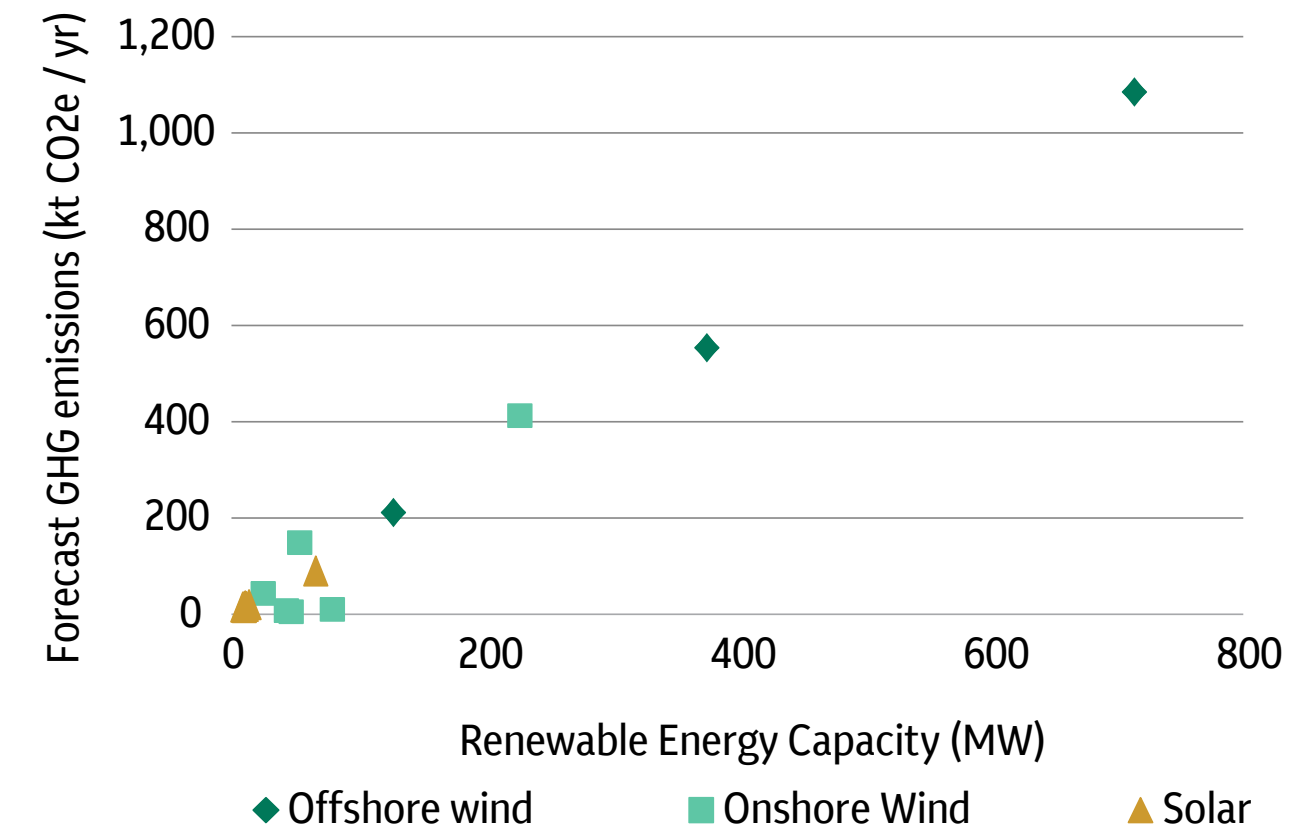
Avoidance of GHG emissions (measured in carbon dioxide equivalent: CO<sub>2</sub>e), both actual and forecast, is derived by comparing the emissions associated with each underlying Project to a counterfactual (alternative method of energy generation. Please see Appendix 2 for counterfactual calculation methodology). In this case, the counterfactual is local marginal electricity grid emissions where the Project is located.

### Other emissions to air avoided

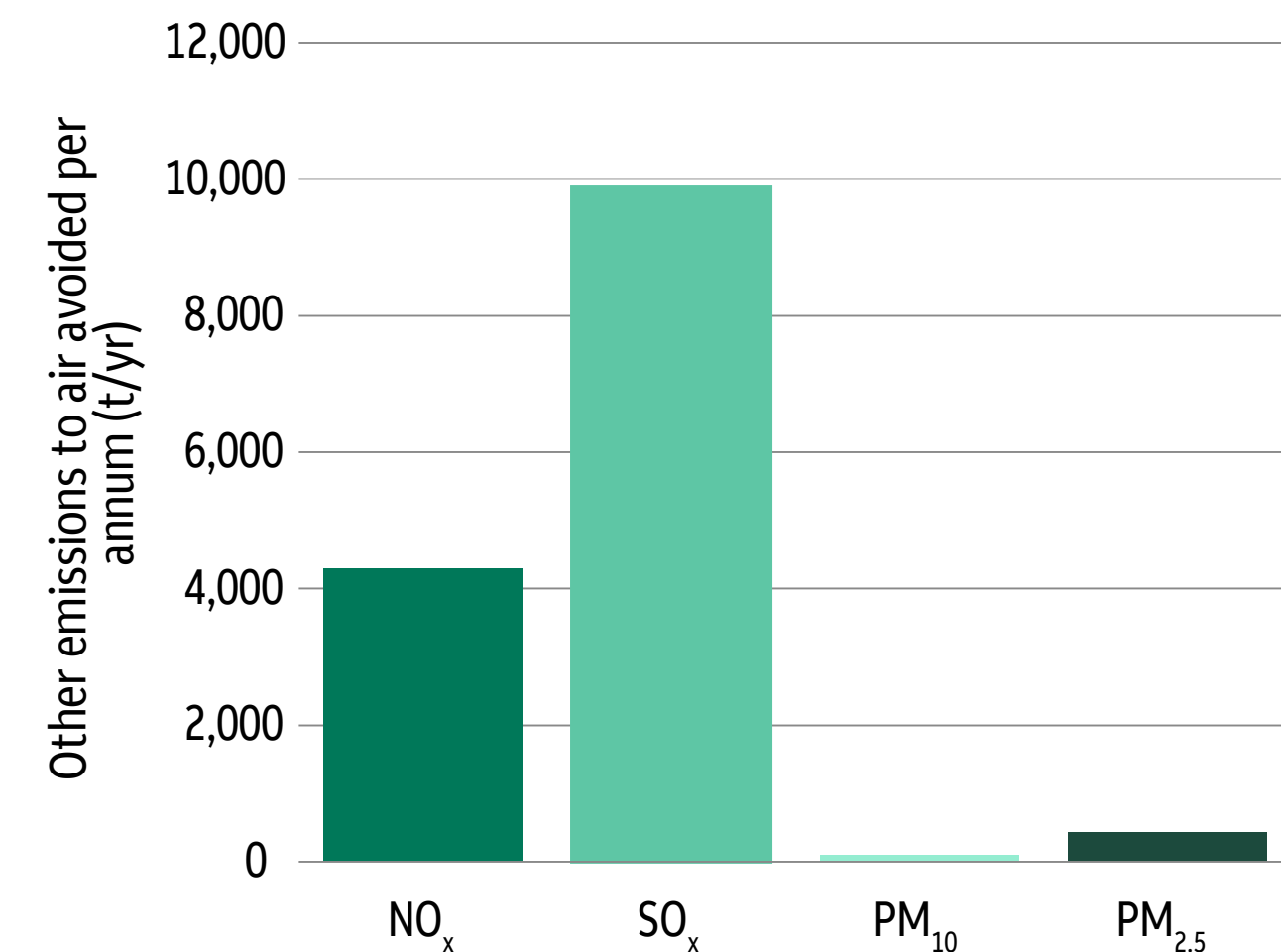
The Portfolio is forecast to result in the avoidance of over 4,000 tonnes NO<sub>x</sub>, nearly 10,000 tonnes SO<sub>x</sub> and over 500 tonnes of particulate matter per year.

Other emissions to air avoided is a measure of net air pollutant emissions compared to the marginal grid generation mix displaced by portfolio. Quantified air pollutant emissions include oxides of nitrogen (NO<sub>x</sub>), oxides of sulphur (SO<sub>x</sub>), particulates up to 2.5 micrometres (µm) in diameter (PM<sub>2.5</sub>) and particulates between 2.5 µm and 10 µm in diameter (PM<sub>10</sub>).

### The Portfolio is forecast to avoid emissions of 2,654 kt CO<sub>2</sub>e / yr



### The Portfolio is forecast to avoid emissions of 4,276 t NO<sub>x</sub> / yr



### Greenhouse gas emissions avoided (carbon dioxide equivalent)

Remaining lifetime	64,023	kt CO <sub>2</sub> e / yr
Average annual	2,654	kt CO <sub>2</sub> e

### Emissions to air avoided

Average annual nitrogen oxides	4,276 t NO <sub>x</sub> / yr
Average annual sulphur oxides	9,843 t SO <sub>x</sub> / yr
Average annual 10µm particulate matter	90 t PM <sub>10</sub> / yr
Average annual 2.5µm particulate matter	427 t PM <sub>2.5</sub> / yr





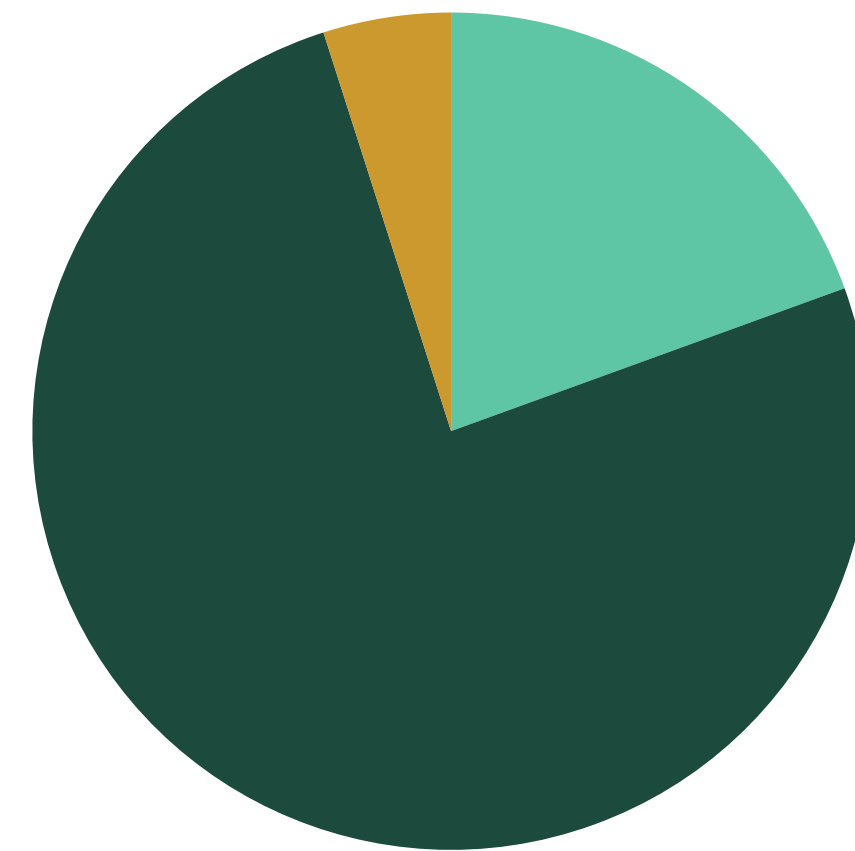
## 2. Green impact forecast

### Fossil fuels consumption avoided

Fossil fuels consumption avoided is a measure of the net consumption of coal, oil and gas avoided, compared to the counterfactual method (for counterfactual methodology please refer to Appendix 2) of grid- based electricity generation, and is normalised to metric kilotonnes of oil equivalent (kt oe).

The Portfolio is forecast to avoid an average of 1,228 kt oe per year. When the underlying projects are aggregated based on technology, they are anticipated to avoid an average of 926 kt oe per year for offshore wind, 241 kt oe per year for onshore wind and 61 kt oe per year for solar PV

The Portfolio is forecast to avoid 1,228 kt oil equivalent annually



■ Onshore Wind   ■ Offshore Wind   ■ Solar

### Fossil fuels consumption avoided

Remaining lifetime	29,230 kt oe
Average annual	1,228 kt oe / yr



Formosa 2 Offshore wind farm



### 3. Green impact forecast accuracy

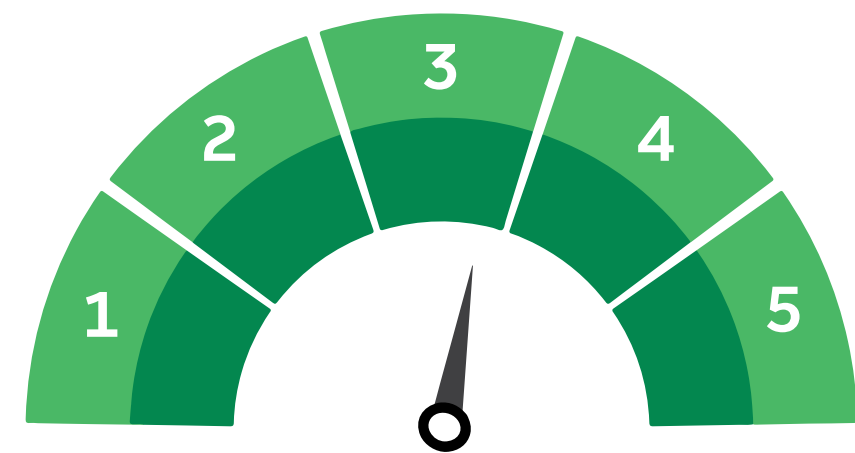
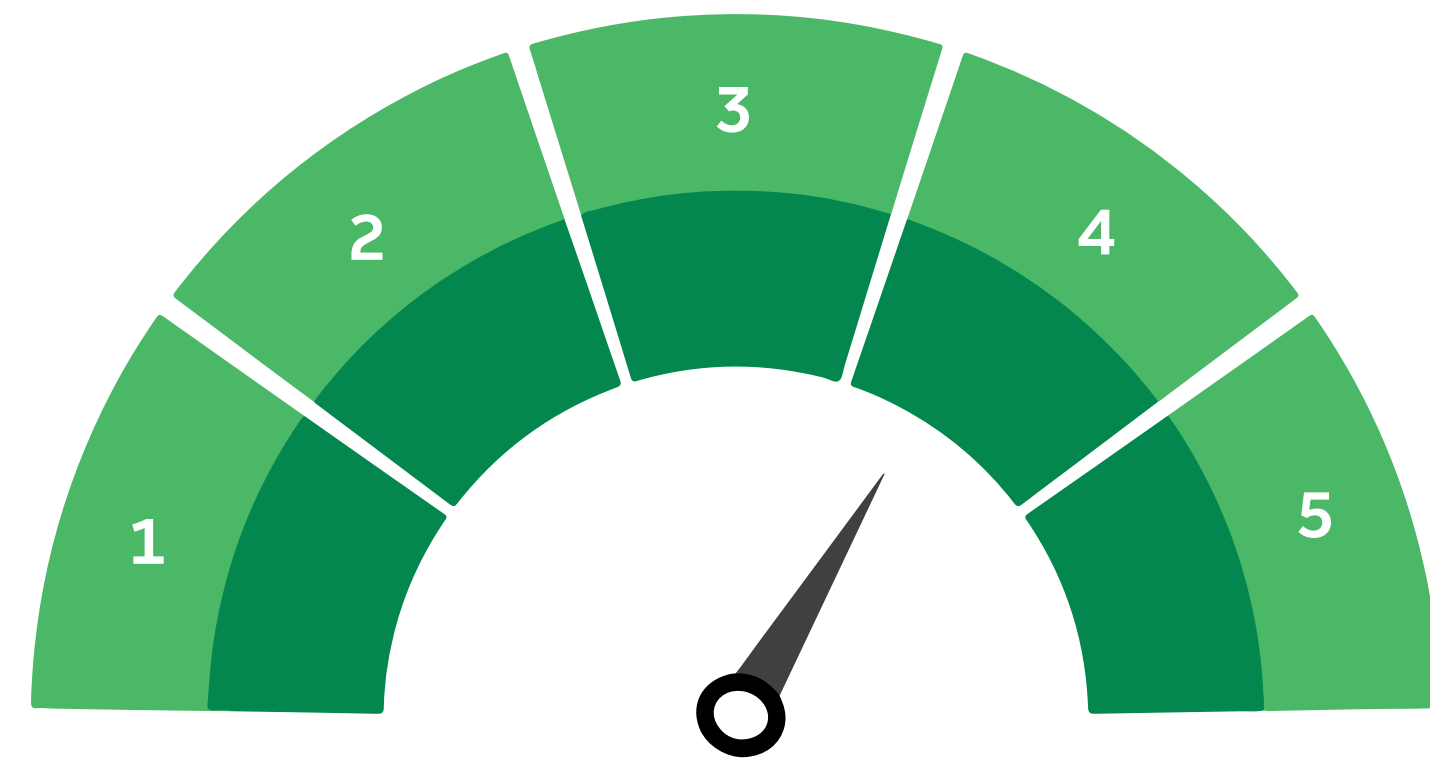
Green Impact Forecast Accuracy is our assessment of the level of confidence that can reasonably be placed on the accuracy of any quantified of any Green Impact Forecast. It is based on information provided to the Green Analytics team (set out on page 16 and in the methodology referred to in Appendix 2).

We assess Green Impact Forecast Accuracy at levels ranging from Level 1 (Low) to Level 5 (Very High), which represent the combined and weighted average of a series of factors, according to our in-house experience of the sensitivity of each element. See Appendix 2 for further detail.

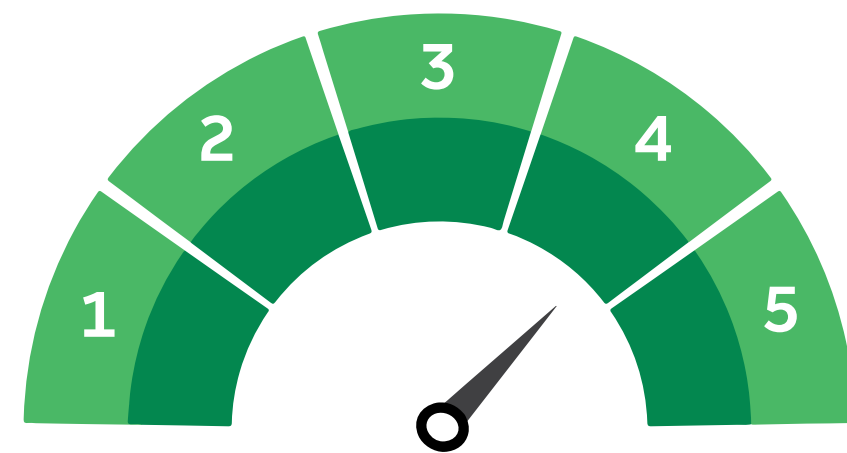
We have assessed the weighted average Green Impact Forecast Accuracy for the Portfolio at Level 4 (High).

The data quality and development stage scores will increase as more of the Projects become operational and actual performance is known. This will then result in an overall increase in Green Impact Forecast Accuracy.

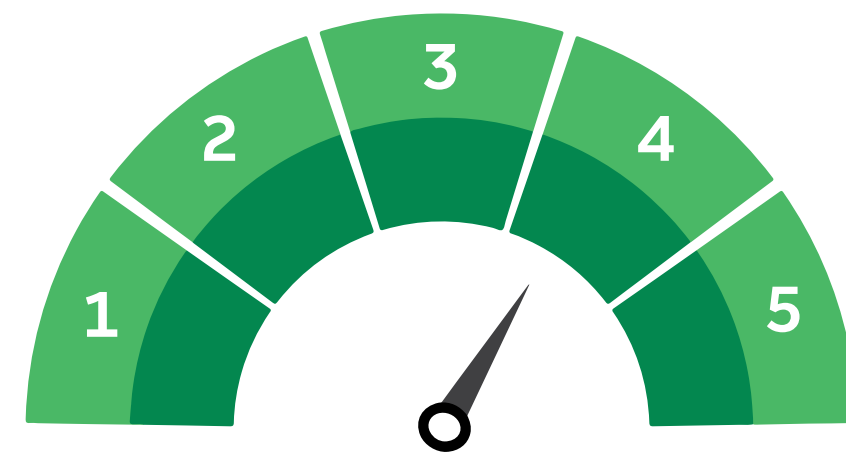
Level 4 (High)



Data quality



Technology & development stage



Local governance



East Anglia ONE offshore wind farm





# 4. Contribution to the Sustainable Development Goals

The United Nations Sustainable Development Goals<sup>28</sup> (SDGs) are a set of 17 goals for sustainable development, defined by 169 SDG Targets to be achieved by 2030.

The Green Analytics team has considered the performance of the Portfolio against the SDGs and their associated Targets. The assessment has identified those Targets to which the Portfolio contribute directly (associated SDGs shown as full coloured icons below), and those Targets to which the Portfolio contribute indirectly (inverted coloured SDG icons below).



<sup>28</sup> <http://sustainabledevelopment.un.org/sdgs>



## Direct contribution

Goal	SDG Target	Contribution
	<b>Target 7.2</b> Increase substantially the share of renewable energy in the global energy mix	The Portfolio accounts for 1,828 MW nameplate capacity for renewable energy generation to the respective local electricity grids.
	<b>Target 9.1</b> Develop quality, reliable, sustainable and resilient infrastructure	

## Indirect contribution

Goal	SDG Target	Contribution
	<b>Target 3.9</b> Reduce deaths and illnesses from air pollution	Following a review of our SDG alignment approach, we have recategorized the Portfolio's contribution to SDG 3 as indirect  According to the World Health Organization, air pollutants such as nitrogen oxides (NO <sub>x</sub> ), sulphur oxides (SO <sub>x</sub> ) and particulate matter (PM) can lead to premature death and illnesses such as stroke, heart disease, lung cancer and chronic respiratory diseases. <sup>29</sup> Avoidance of fossil fuel electricity generation due to renewable generation is forecast to avoid average annual emissions of harmful air pollutants of:  4,276 t NO <sub>x</sub> / yr      90 t PM <sub>10</sub> / yr 9,843 t SO <sub>x</sub> / yr      427 t PM <sub>2.5</sub> / yr
	<b>Target 12.2</b> Achieve the sustainable management and efficient use of natural resources	Avoidance of fossil fuel electricity generation due to renewable generation results in the forecast avoidance of the consumption 1,228 kt oil equivalent annually.
	<b>Target 13.3</b> Improve human and institutional capacity on climate change mitigation	The Portfolio raises awareness and improves institutional capacity on climate change mitigation and negative impact reduction.  The Portfolio is forecast to avoid 2,654 kt CO <sub>2</sub> e of greenhouse gas emissions annually.

<sup>29</sup> World Health Organization, Ambient air pollution - a major threat to health and climate: <https://www.who.int/airpollution/ambient/en/>





# Appendix 1

## Portfolio: Key Project data<sup>30</sup>

Project Name	Location	Technology	Capacity (MW)	Stage	Calendar year of Commercial Operations Date (estimated for future dates)
East Anglia One	UK	Offshore Wind	714	Operational	2020
Formosa 1	Taiwan	Offshore Wind	128	Operational	2019
Formosa 2	Taiwan	Offshore Wind	376	Construction	2023
Lal Lal Wind Farm	Australia	Onshore Wind	228	Operational	2022
Tysvaer	Norway	Onshore Wind	47	Operational	2022
Buheii	Norway	Onshore Wind	80	Operational	2022
Hornamossen	Sweden	Onshore Wind	43	Operational	2021
Jozwin	Poland	Onshore Wind	25	Operational	2015
Kaomatikuntla - 01 (Vibrant Energy)	India	Solar PV	11	Operational	2017
Kaomatikuntla - 02 (Vibrant Energy)	India	Solar PV	14	Operational	2020
Palamakulla (Vibrant Energy)	India	Solar PV	9	Operational	2017
Tanakallu - 01 (Vibrant Energy)	India	Solar PV	12	Operational	2017
Tanakallu - 02 (Vibrant Energy)	India	Solar PV	9	Operational	2018
Telcontar (Vibrant Energy)	India	Solar PV	67	Operational	2022
VEH Srishti (Vibrant Energy)	India	Onshore Wind	54	Construction	2023
Vizianagaram (Vibrant Energy)	India	Solar PV	10	Operational	2019

<sup>30</sup> Data correct at 31st March 2023 unless stated otherwise





# Appendix 2

## Terms and conditions: terminology and methodology

### Terminology

#### Green impact

The Green Impact metrics covered by this Report are identified in the header and executive summary. “Green Impact” is a collective term referring to the environmental benefits which have been calculated in accordance with GIG’s methodology to be, or to be reasonably likely to be, delivered by the project(s) to which this Report refers. The collective term can include defined metrics such as tonnes carbon dioxide equivalent avoided (t CO<sub>2</sub>e), tonnes oil equivalent avoided (toe), and tonnes (t) of other air pollutant emissions avoided.

#### Green impact forecast accuracy

“Green Impact Forecast Accuracy” is an expression of the level of confidence that, in the opinion of GIG, can reasonably be placed on the accuracy of any quantified Green Impact forecast. This assessment of forecast accuracy is described in levels as follows: Level 1 (Low), Level 2 (Moderate), Level 3 (Good), Level 4 (High), and Level 5 (Very High).

#### Methodology v 1.2

The Green Impact and Green Impact Forecast Accuracy assessments presented in this Report are based on GIG’s approach to assessing Green Impact using the methodologies set out within its proprietary green investment principles, policies and the associated processes. The Green Impact assessment has applied proprietary modelling techniques and comparative data developed and owned by GIG, or by third party owners and made available under licence to GIG.

#### Green impact calculation

GIG’s initial calculation of the Green Impact of each project is produced by comparing relevant information and data derived from that project against relevant counterfactual (or baseline) data for the assumed environmental impacts that would occur if the project did not take place, based on GIG’s proprietary reference sources or provided to GIG by relevant third parties or obtained from publicly available sources. The resultant estimated Green Impact is then subject to further qualitative evaluation before production of GIG’s formal Green Impact Report.

For grid-connected projects that generate electricity, the counterfactual is assumed to be marginal electricity generated from the local electricity grid, which includes resources consumed to supply grid electricity. GIG’s methodology calculates the net Green Impact of the project by comparing its likely emissions to those of a marginal grid electricity mix, using the methodology set out in the International Financial Institutions (IFI) approaches to GHG accounting for renewable energy projects, energy efficiency projects and project emissions associated with grid electricity consumption.<sup>31</sup>

GIG’s methodology calculates results for likely Green Impact on an annual and lifetime basis. The Green Impact reported is 100% of the Green Impact of the underlying project(s), irrespective of the portion of the year for which financing has been allocated. There is no proportionate allocation of Green Impact to any particular project investment or to particular investors, all of whom may report the same Green Impact from the underlying project(s).

#### Exclusions

The counterfactual of marginal grid electricity does not include the total quantifiable lifecycle environmental burdens (e.g. resources consumed during construction, or indirect emissions during operations such as those from associated transport vehicles) associated with energy generation. Therefore, to produce a valid comparison, the calculation of Green Impact for the project(s) assessed in this Report is based solely on the operational phase of the relevant project(s), and does not include a full lifecycle assessment of the project(s) unless specifically stated otherwise. This approach is aligned with the Greenhouse Gas Project Protocol.<sup>32</sup> GIG’s assessment does not include a review of any underlying project’s environmental and/or social, permitting, licensing or other compliance status.

#### Green impact forecast accuracy

Green Impact Forecast Accuracy is determined from a number of project parameters that include the project technology, stage of project development, and location of the project, together with GIG’s opinion of the input data quality. These parameters have been assigned values that represent the degree to which they affect the accuracy of the forecast Green Impact, and are used to produce Forecast Accuracy scores for three elements: Data quality, Technology & development stage, and Local governance.<sup>33</sup> The Forecast Accuracy scores for the three elements are weighted according to GIG’s in-house experience of the sensitivity of each element and combined to derive an overall level of Green Impact Forecast Accuracy.

#### Carbon score

Our Carbon Score shows the quantified greenhouse gas emissions avoided combined with our Carbon Rating. The Carbon Rating is a measure of a project’s lifecycle greenhouse gas emissions compared to the emissions of the counterfactual. Projects with the lowest lifecycle emissions relative to the counterfactual would score the highest ratings from AAA to B. Projects with lifecycle emissions similar to the counterfactual would score a C, and projects with greater emissions would score a D or E. The emissions of the counterfactual are derived from the IFI approaches to greenhouse gas accounting – please see above for details. Where we do not have project-specific information on lifecycle emissions, we use the median harmonised values from the US National Renewable Energy Laboratory’s Lifecycle Assessment Harmonization.<sup>34</sup>

<sup>31</sup> <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies>

<sup>32</sup> [www.ghgprotocol.org/standards/project-protocol](http://www.ghgprotocol.org/standards/project-protocol)

<sup>33</sup> Local governance scores are determined from datasets of indicators from the World Bank, Transparency International and United Nations University Institute for Environment and Human Security

<sup>34</sup> <https://www.nrel.gov/analysis/life-cycle-assessment.html>





# Appendix 3

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# Appendix 3

## Terms and conditions: assumptions, limitations and other terms

### Reference data

In preparing this Report, GIG has relied upon various sources of data and information provided to GIG by relevant third parties or obtained through public information sources, the content of which no GIG Party has verified or controls.

GIG calculates Green Impact using reference data obtained from, among others, by the Ecoinvent life cycle inventory datasets for the calculation of environmental impacts. Green Impact is also calculated based on data supplied by the International Energy Agency (“IEA”), specifically from the 2015 editions of the World Energy Statistics and Balances dataset and the CO<sub>2</sub> Emissions from Fuel Combustion dataset.

Any limitations and caveats that are applicable to the Ecoinvent and IEA datasets, as published on their websites, are also applicable to the results presented in this Report.

GIG’s method is designed to work with a limited number of key inputs and to be globally applicable, and makes some simplifying assumptions in order to achieve this degree of flexibility.

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📷 Komatikuntla (K1) Solar Power Plant



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# Appendix B

## PwC Assurance Report

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To: The Directors of Macquarie Group Limited

## **Independent assurance report on Macquarie Group Limited’s application of the four pillars outlined in section 3 of the Macquarie Green Finance Framework for the year ended 31 March 2023**

### **Scope**

In accordance with the terms of engagement letter dated 2 June 2023, we were engaged by Macquarie Group Limited (the “Group”, “Macquarie” or MGL”) to perform an independent reasonable assurance engagement in respect of whether, in all material respects, all eligible projects have been notionally allocated green tranche financing (“Projects”) in accordance with the four pillars outlined in Section 3 of Macquarie’s Green Finance Framework (“GFF”) for Macquarie Group Limited for the year ended 31 March 2023 (the “year end”). The four pillars outlined in Section 3 of the GFF (the “Criteria”) against which we assessed the Projects are as follows:

1. Use of proceeds
2. Process for project evaluation and selection
3. Management of proceeds
4. Reporting

### **Directors’ responsibilities**

The Directors of Macquarie are responsible for:

- (a) For the preparation of Macquarie’s 2023 Green Finance Impact Report which will be attached to our report, that Macquarie has, in all material respects, applied the Criteria for the Projects for the year ended 31 March 2023.
- (b) For applying the Criteria in assessing the Projects for the year ended 31 March 2023.

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(c) For identification of risks that threaten the application of the Criteria for the Projects being met and controls which will mitigate those risks.

### **Our Independence and quality management**

We have complied with the ethical requirements, of the Accounting Professional and Ethical Standard Board's APES 110 Code of Ethics for Professional Accountants (including Independence Standards) relevant to assurance engagements, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Our firm applies Australian Standard on Quality Management ASQM 1, *Quality Management for Firms that Perform Audits or Reviews of Financial Reports and Other Financial Information, or Other Assurance or Related Services Engagements*, which requires the firm to design, implement and operate a system of quality management including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

### **Our responsibility**

Our responsibility is to express an opinion based on the procedures we have performed and the evidence we have obtained.

Our engagement has been conducted in accordance with the Australian Standard on Assurance Engagements (ASAE 3000) *Assurance Engagements Other Than Audits or Reviews of Historical Financial Information*. That standard requires that we plan and perform this engagement to obtain reasonable assurance on whether the eligible projects have been notionally allocated green tranche financing in accordance with the Criteria as outlined in Section 3 of the GFF for the year end. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in all material respects, as evaluated against the GFF, for the projects which have been notionally allocated green tranche financing. In making those risk assessments, we considered internal control relevant to the MGL's preparation of the Green Finance Impact Report. Our procedures included:

- Obtained evidence of the activities and controls implemented to meet the Criteria for the Projects for the year end.
- Any necessary procedures selected depend on our judgement, including the identification and assessment of risks of material misstatement, as evaluated against the GFF. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.





### **Use of report**

This report was prepared for the Directors of Macquarie for the purpose of providing reasonable assurance over whether, in all material respects, eligible projects have been notionally allocated green tranche financing in accordance with the Criteria outlined in the GFF for Macquarie.

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### **Inherent limitations**

Because of the inherent limitations of any assurance engagement, together with the internal control structure, it is possible that fraud, error or non-compliance may occur and not be detected. A reasonable assurance engagement is not designed to detect all instances of eligible projects which have not been notionally allocated green tranche financing in accordance with the Criteria as it is not performed continuously throughout the year ended 31 March 2023. The assurance procedures performed in respect of notional allocation of the green tranche financing to the Projects in accordance with the Criteria are undertaken on a test basis. The reasonable assurance conclusion expressed in this report has been formed on the above basis.

### **Conclusion**

In our opinion, in all material respects, Macquarie, has notionally allocated green tranche financing to eligible projects in accordance with the Criteria for the year ended 31 March 2023.

*PricewaterhouseCoopers*

PricewaterhouseCoopers

*C. Mara*

Caroline Mara  
Sydney  
Partner

27 July 2023



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